



SwedishAmerican

PEOPLE WHO CARE

THE RADIATION ONCOLOGY CENTER FOR NORTHERN ILLINOIS

Associate Radiation Oncologists Thornton C. Kline, Jr., M.D., Chairman • Prakash J. Pedapati, M.D.

Section of Medical Physics D.G. Bhawe, Ph.D., Director • H. Sayegh, M.S.

Chief Radiotherapy Technologist Kristine R. Johnson, R.T.T.

School of Radiotherapy Technology Carol G. Lunn, R.T.T., Director

April 1, 1985

U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

RECEIVED BY LFMB	
Date	4/12/85
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By	VP
Orig. To	R. T. T.
Action Compl.	

RECEIVED

'85 APR 12 A7:08

U.S. N.R.C.
LIC. FEE MGMT. BRANCH

RE: Teletherapy License NO. 12-01610-02

Dear Gentlemen:

Please find enclosed the report of the radiation surveys which I have made for our Cobalt-60 radiation facility after the source change on 3/1/85. Also enclosed are: 1) A copy of the head leakage survey performed by Mr. VanArt (a physicist and licensed source handler contracted by Toshiba Medical Systems) on March 2, 1985, after the source change. 2) A copy of the certificate of measurement provided with the source by General Electric Company.

Our Toshiba Cobalt-60 Teletherapy Unit (Model RCR-120-C3) has a yoke mounted head with a swing motion capability. The head can rotate 130 degrees forward (beam swinging away from the gantry) or 30 degrees backward (beam aiming towards the gantry). As this capability permits the aiming of the beam off the centerline of the room we have required the manufacturer to provide a switch to disable this motion electrically during installation in 1975.

Drawings of the room are enclosed with the survey report. No significant levels of radiation were found in the barrier survey at any of the points of measurements for any orientation of the beam along the centerline of the room.

We have not received a source certificate from G.E. as yet. On inquiring with Toshiba Medical System we were informed that the certificate will be mailed to us in the next 2 weeks. We will send the source certificate as soon as it is received.

I trust that the enclosed documents and survey report will satisfy NRC

8506030555 850515

REG3 LIC30

12-01610-02

PDR

SwedishAmerican Hospital
1400 Charles Street
Rockford, Illinois 61108-1257
815/968-4400 Ext. 4850

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FEE EXEMPT
APR 03 1985

REGION III

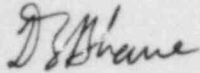
APR 3 1985

CONTROL NO. 78652

Page 2
4/1/85

reporting requirements. If you need any more information, please let me know.

Sincerely,



D.G. Bhawe, Ph.D.
Radiation Safety Officer

Enclosures:

- 1) Radiation Survey Report
- 2) Head Leakage Survey
- 3) Barrier Survey with Drawing
- 4) Shipping information for new and old sources
- 5) Radiation exposure report on persons involved in source change

DGB:jm

CONTROL NO. 78652

GrayLine. SHIP-A-WAY FOR?

Shipper's No. _____

Center's Ha

$$(H \text{ forms } \leq t \text{ } \& \text{ } t \text{ } \leq t_{\text{max}})$$

REC-1P(U), subject to the classifications and built, in effect on the date of the issue of this bill of lading.

of	12	From
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the property of the following important result: Every continuous function on a compact set has a maximum and a minimum. This result is the first of the three theorems proved in this chapter. The second theorem is the Intermediate Value Theorem, which states that if a function is continuous on a closed interval, then it takes on every value between its minimum and maximum. The third theorem is the Weierstrass Approximation Theorem, which states that every continuous function on a closed interval can be approximated by a polynomial function.

I hereby certify that by signing below all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the first column of the tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assign.

Consigned to General Electric Co. Vallecitos Nuclear Center

Mail or the address of each agency. For agency contact information, see

Destination Pleasanton State CA Zip 94566 County _____

Delivery _____
Address _____

(★) To be filled in only when paper defect and location is identified by drawing box.

Route

Delizyana Carter

Car or Vehicle Initials:

146

[illegible]

TOSHIBA MED SYS
1031 E STATE PARKWAY
SEANUM A6, EG, 60135
815-314-6117 312 885-2225

Shipper, Per.

Agent, Per

Management post-office address of shipper.

Wilson Jones
PRESIDENT, JONES & BROS. CO.

CONTROL NO. 78652

PACKING SLIP

SHIP TO: General Electric
Vallecitos Nuclear Center
Pleasanton, CA 94566

- 1 Wheel box (non radioactive)
- 1 Cask, Radioactive material, special form, n.o.s.
UN2974, seal number
Quantity hazardous material: approx. 7.5 grams
Radionuclide: Cobalt-60
Type A1
Activity: 2873 Curies
Label: yellow II
Transport Index: 0.3
Package Identification: USA-DOT- 20 WC-6, Type B

Surface radiation level, less than 0.1 mR/hr.

Exposure rate at 3 feet from container, less than 0.3 mR/hr

LEAK TEST: A cotton swab was used to wipe the interior of the source of the source access drawer. No activity above background radiation counts was detected.

CONCLUSION: Leak test negative.

J. Van Ant 3/1/85
Radiation Physicist

SHIPPER: Toshiba Medical Systems
1031 E. State Parkway
Schaumburg, IL 60195

California Radioactive Material License 3367-59

CONTROL NO. 78652

PACKING LIST (WITH SHIPMENT)

Vallecitos Nuclear Center - Pleasanton, CA 94566

ISOTOPE SHIPPING MEMO

CUSTOMER ORDER NO. HQ24552				DATE 2/20/85		G.E. REQUISITION NO. 284-P4L72		NO.		PROJECT NO. P4L72	
TAX 11	PPD X	COLL	SHIP VIA Surface			JOB ORDER NO. K42-P4L72			M/S OR S/N		

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Linden Industrial Services
2305 20th Avenue
Rockford, Illinois 61125

Attn: Don Blafco
815-397-3011

Part 1 of 1

HAZARD CLASS: RADIOACTIVE MATERIAL
TYPE MATERIAL: **Co-60** PHYSICAL STATE: **Solid**
PROPER SHIPPING NAME: HAZARD I.D. NO.

<input type="checkbox"/>	RADIOACTIVE MATERIAL, n.o.s.	UN2982
<input checked="" type="checkbox"/>	RADIOACTIVE MATERIAL, SPECIAL FORM, n.o.s.	UN2974
<input type="checkbox"/>	RADIOACTIVE MATERIAL, EMPTY PACKAGE	UN2908
QUANTITY		PACKAGE
<input type="checkbox"/>	TYPE A ₁	<input checked="" type="checkbox"/> TYPE B
<input type="checkbox"/>	TYPE A ₂	<input type="checkbox"/> HRCQ
<input type="checkbox"/>	TYPE A	<input checked="" type="checkbox"/> TYPE B
<input type="checkbox"/>	TYPE B(M)	<input type="checkbox"/> TYPE B(U)

☐ INTENDED FOR MEDICAL DIAGNOSIS,
TREATMENT OR RESEARCH USE.

SPECIAL INSTRUCTIONS

1) PACKAGED PER RP&S PROCEDURES: CHAPTERS III AND XVI.

2) -Wheel Box (800 lbs) to ship with cask.

3) Total Heat Load = 95 Watts.

4) Final Destination: Swedish American
Hospital, Rockford, Illinois

LIC. NO. 12-01610-02-

SEAL NO. 00695 Cask No. RCT-80

CONTAINER: 20WC-6-001 WT. 5,900 LBS.

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Toshiba Medical Systems
2241 Michelle Drive
Tustin, California 92680

ISOTOPE NAME AND MASS NUMBER	LOT NUMBER	TOTAL ACTIVITY SHIPPED	PRODUCT VOLUME OR WEIGHT	CHEMICAL FORM
Cobalt-60	GET-15-71	6,148 Ci	26 gms	Metal

CALIBRATION DATE	CONCENTRATION*	SPECIFIC ACTIVITY*	RADIOPURITY*
3/1/85	N/A	N/A	N/A

*VALUES ON CALIBRATION DATE

INVOICE QUANTITY	UNIT PRICE	ESTIMATED VALUE
N/A		

INTENSITY OF RADIATION
UNSHIELDED

On the ship date the radiation level was
6800 mR/hr @ **39** inches.
This information is included in order that
you may know the intensity of the radia-
tion with which you will be working.

RADIATION SURVEY

This survey is the result of readings taken after
material is completely packaged and ready for
shipment. Smearable contamination and package
dose rates meet D.O.T. requirements.

Max. Surface Radiation **5** mR/hr
Transport Index **1**

Released for
Shipment:

NUCLEAR SAFETY

CAUTION

Radiopurity is calculated for the above
calibration date and may change with time,
dependent upon the decay rates of any
radioactive materials present.

This material has not been sterilized or
certified for medical use in its present form.

APPROVAL FOR SHIPMENT

IPO-RP&S

SHIPPERS LICENSE NO. 0017-59 (CALIFORNIA)
TELEPHONE NO. (415) 862-2211

TRAFFIC & SHIPPING RELEASE

METHOD OF SHIPMENT
LABELING:

TRANSCON

TRANSPORT INDEX **1**

RADIOACTIVE WHITE I ☐ RADIOACTIVE YELLOW II ☒ RADIOACTIVE YELLOW III ☐
EMPTY ☐ CARGO AIRCRAFT ONLY ☐ PLACARDS REQUIRED ☐ OTHER ☐

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition
for transportation according to the applicable regulations of the Department of Transportation.

B. J. Cordero

TRAFFIC AGENT SIGNATURE

2-20-85

DATE

6		CONSIGNEE'S COPY OR ORIGINAL INVOICE IF PAID ON DELIVERY		transcon LINES		P.O. BOX 92220, LOS ANGELES, CA 90009		008-583931	
DATE	DEST	BI	CP	RC	ADVANCE	TC REV	BEYOND	TRAILER	ZIP
022085	198	D	F	1		62787		210019	X
CONSIGNEE LINDEN INDUSTRIAL SERVICES									5X10
DEST 2305 - 20TH AVE@ROCKFORD IL									61125
SHIPPER GENERAL ELECTRIC									1.0
ORIGIN VALLECITOS RD@PLEASANTON CA									94566
C/LC CODE									SHIPPER'S NO
C/LC NAME									BB96807A10163
C/LC PRO NO									
C/LC DATE									27
DEST C/LC									
PIECES	DESCRIPTIONS					KEY WORDS	WEIGHT	RATE	CHARGE
1	HAZARDOUS MATERIALS BAL ON CONS ADDRESS/ ATTN DON FLAFCO 815 397-3011 BAL ON SHPRS ADDRESS/ VALLECITOS NUCLEAR CENTER CASK RADIOACTIVE MATERIAL SPEC. FORM NOS UN 2974/QUANTITY HAZ- ARDOUS MATERIAL 26 GRAMS RADIONUCLIDES COBALT 60 ACTIVITY 6,148 C1 CONTINUED						5900		

Thank You

Keep Specifying...

transcon

→ FEDERAL LAW REQUIRES PAYMENT OF FREIGHT CHARGES WITHIN 7 DAYS

← RECEIVED PAYMENT TRANSCON LINES

BY CASH ☐ BY CHECK ☐

DRIVER

DATE

6		CONSIGNEE'S COPY OR ORIGINAL INVOICE IF PAID ON DELIVERY		transcon LINES		P.O. BOX 92220, LOS ANGELES, CA 90009		008-583931-01	
DATE	DEST	BI	CP	RC	ADVANCE	TC REV	BEYOND	TRAILER	ZIP
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CONSIGNEE									
DEST									
SHIPPER									
ORIGIN									
C/LC CODE									
C/LC NAME									
C/LC PRO NO									
C/LC DATE									
DEST C/LC									
PAGE 02 OF 008-583931									
PIECES	DESCRIPTIONS					KEY WORDS	WEIGHT	RATE	CHARGE
1	YELLOW LABEL II/TRANSPORT INDEX 1/PKG IDENT. 20WC 6 001 CASK NO RCT 80/ NMFC 164900, SUB 1 CL 70 RVNX .40 C/LB WHEEL BOX DITTO TCON 605 NATL ACCT E-117					DISCOUNT PPD	800	1892	126764
2	TTL EOB RATED 85052 01.02 CC1						6700	.5047	63977
								TO BE	PREPAID

Thank You

Keep Specifying...

transcon

62787

→ FEDERAL LAW REQUIRES PAYMENT OF FREIGHT CHARGES WITHIN 7 DAYS

← RECEIVED PAYMENT TRANSCON LINES

BY CASH ☐ BY CHECK ☐

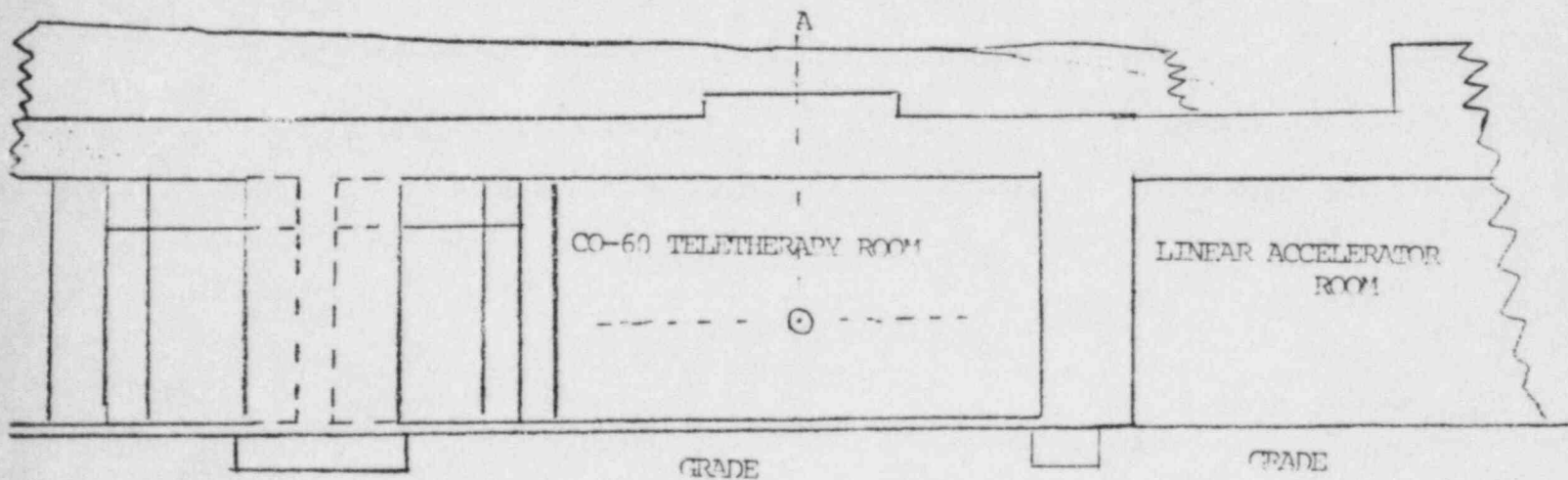
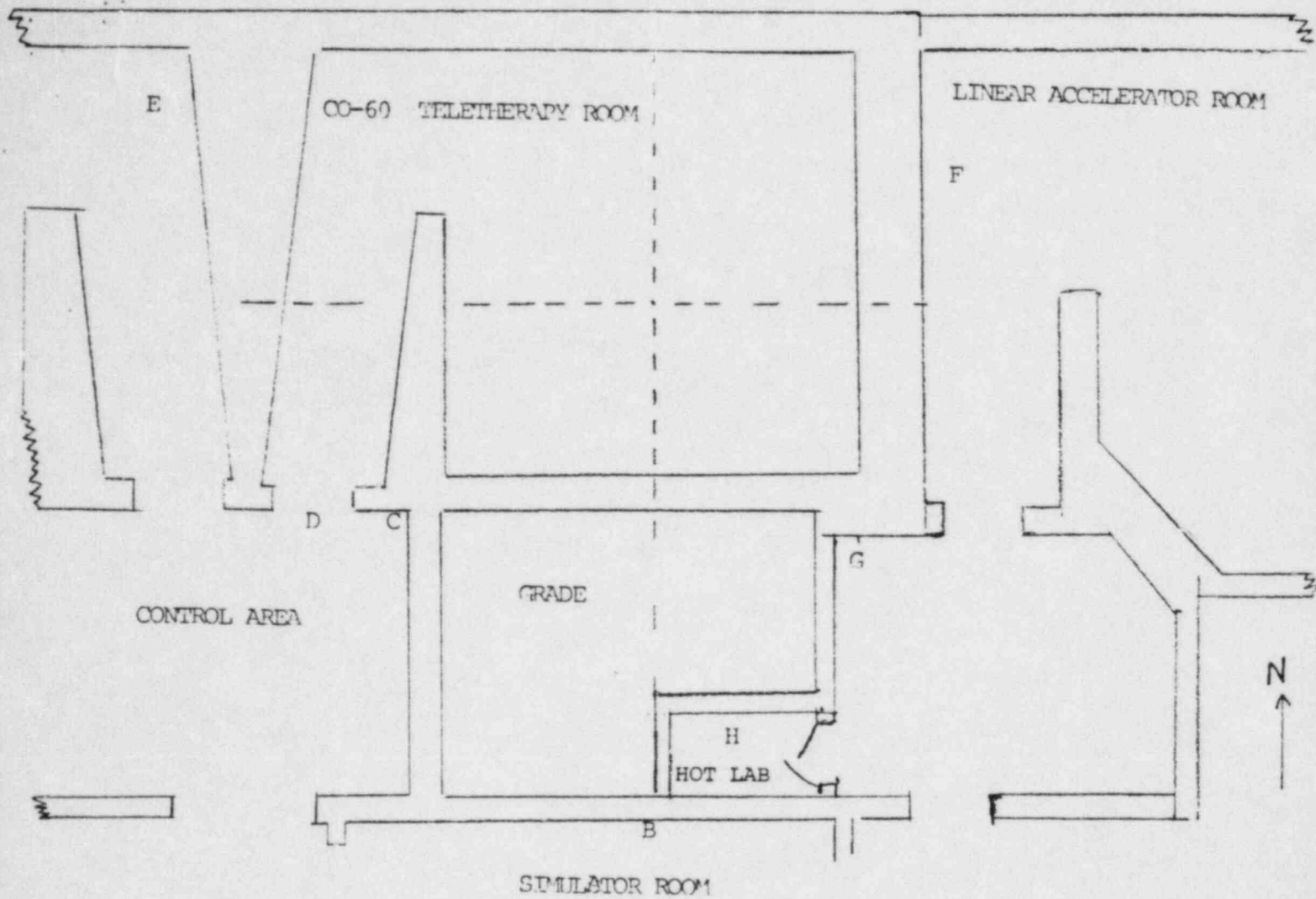
DRIVER

DATE

CONTROL NO. 78652

PLAN VIEW

GRADE



ELEVATION VIEW

1/8" = 1'

3/14/85

CONTROL NO. 8652

BARRIER SURVEY

Survey was carried out, after the installation of new source, with the collimator set for full field and a phantom in the primary beam of radiation for beam directions I, II, III, & IV and no phantom in the primary beam for beam directions V & VI. The survey instrument was Keithley 36150, SN 19443.

<u>Beam Direction</u> ¹	<u>Survey Point</u> ³ MR/hr							
	A	B	C	D	E	F	G	H
I	M ²	M	M	0.1	M	0.1	0.1	0.1
II	M	M	M	M	M	M	0.1	0.1
III	M	M	M	0.1	M	M	M	M
IV	M	M	M	0.1	M	0.1	M	M
V	M	0.1	M	M	M	M	M	0.1
VI	0.2	M	M	M	M	M	M	M

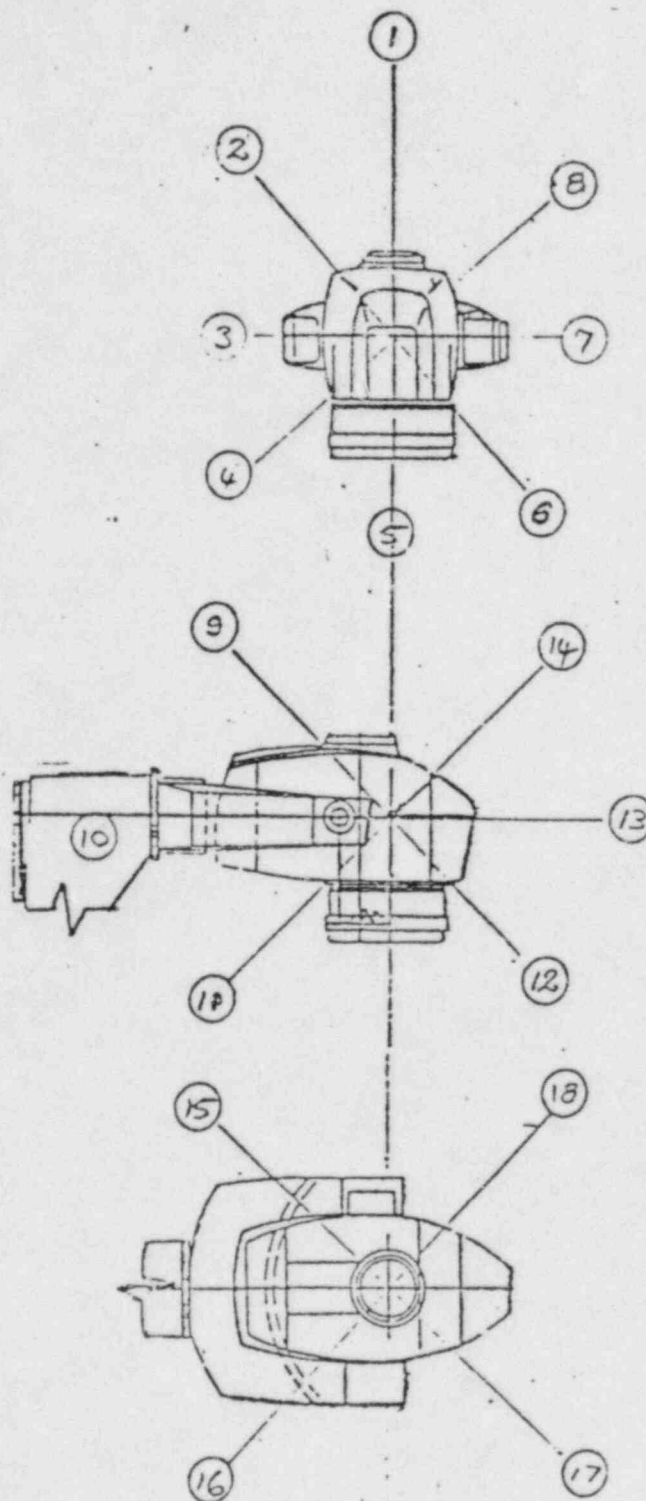
1. Definition of Beam Directions

- I. Towards floor at centerline of room.
- II & V. Towards south wall at centerline of room.
- III & VI. Towards ceiling at centerline of room.
- IV. Toward north wall at centerline of room.

2. "M" means unreadably small, less than 0.1 MR/hr.

Definition of Survey Points

- A. Above ceiling at center of room.
- B. Behind south wall.
- C. Control area (near corner).
- D. At door.
- E. West wall (behind maze in the old linear accelerator room)
- F. East wall (behind maze in the new linear accelerator room)
- G. South east corner (in the new linear accelerator control room)
- H. South wall (Hot Lab.)



POSITION

mR/hr
@ 1 Meter

1

0.8

2

0.3

3

0.2

4

0.5

5

2.1

6

0.3

7

< 0.1

8

0.3

9

0.2

10

0.2

11

0.9

12

0.3

13

0.1

14

< 0.1

15

< 0.1

16

< 0.1

17

0.3

18

0.3

TOTAL

AVERAGE

SURVEY INSTRUMENT
Keithley 36150 SN 19493
SURVEYOR
A. Van A. - T. Zipper
DATE 3/2/85
2-1-9/25/85

RADIATION SURVEY REPORT

By: Dattatraya G. Bhave, Ph.D

For: Swedish American Hospital
1400 Charles Street
Rockford, Illinois 61101

NRC License Number: 12-01610-02
Date: 3-1-85
Machine: Toshiba ⁶⁰Co Teletherapy Unit
Model: RCR-120-C3
Source: General Electric ⁶⁰Co #GET-15-71
Activity: 6148 Ci on 3-1-85
Exposure Rate: 6800 RHM (Measured by GE)
Caution Signs: Posted
T.V. Viewing System: Functional

Leak Test: Leak test on old source performed by
Swedish American Hospital Physicist.
Detectable activity upper limit =
0.00003 μ Ci

Emergency Off Switch: Functional
Emergency Instructions: Posted
Door Interlock: Functional
On-Off Indicators:
Source Housing: Functional
Control: Functional
Treatment Timer: Functional
Radiation Monitor: Functional

Physicist: *D G Bhave*

Date: 3-5-85

DATE RECEIVED IN HOW DAYS

DATE RECEIVED IN HOW DAYS

DATE RECEIVED IN HOW DAYS

FORM 1A 4-73 (Rev. 11-71)
FEDERAL BUREAU OF INVESTIGATION
U.S. DEPARTMENT OF JUSTICE

Landauer
R. S. Landauer, Jr. & Co.
Division of TechOps, Inc.
2 Science Road, Glenwood, Illinois 60425-1586
(312) 755-7000

Accredited by the
National Bureau of Standards
through

RADIATION DOSIMETRY REPORT

PARTICIPANT ID NUMBER	NAME	SOCIAL SECURITY NUMBER	NOTE (SEE REVERSE SIDE)	DOSE METER	RADIATION QUALITY	EXPOSURE TO BADGE (MILLIREMS) FOR PERIODS INDICATED BELOW				CALENDAR QUARTER				CUMULATIVE TOTALS (MILLIREMS)				ADJUSTMENTS	USERS PART IN ACCUMULATION (INITIALS)	BIRTH DATE	NUMBER BADGE REPORTS	ACQ/PM RPT/PM RPT/PM RPT/PM				
						DEEP		SHALLOW		DEEP		SHALLOW		DEEP		SHALLOW							DEEP		SHALLOW	
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IMPORTANT: SEE REVERSE SIDE FOR ADDITIONAL EXPLANATIONS