



# University of Pittsburgh

RADIATION SAFETY OFFICE

August 16, 1985

U.S. Nuclear Regulatory Commission  
Region 1  
631 Park Avenue  
King of Prussia, PA 19406

Gentlemen:

This letter transmits a copy of the required paperwork associated with the replacement of a teletherapy source as stated in license #37-00245-05, Condition #18. The source was replaced on August 1, 1985 and the survey was performed on August 2, 1985. Treatment of patients began on August 5, 1985.

In the enclosure are the results of the full calibration which include the timer error and the beam output.

If there are any questions, please do not hesitate to call.

Sincerely,

*Niel Wald*

Niel Wald, M.D.  
Chairman  
Radiation Safety Committee

Enclosure

cc: R.S.O.

AM/jh

8509190540 850910  
REG1 LIC30  
37-00245-05 PDR

*Aug - 25 - I*

Applicant	.....
Check no.	.....
Amount	.....
Type of	.....
Date Check Rec'd	.....
Received By	<i>Jacques</i>

U.S. NUC. REG. COM.  
REGION 1  
KING OF PRUSSIA, PA.  
19406  
12-2-85

FEE EXEMPT

"OFFICIAL RECORD COPY"

ML10 04281

# RADIATION SURVEY REPORT

Teletherapy Head - Beam Off

P&S 43407

Customer PRESBYTERIAN UNIVERSITY HOSPITAL

Location PITTSBURGH PENNSYLVANIA 15213

Model THEAPTRON 80

Serial Number 109

## SOURCE DATA

Serial No. S 3757 Diameter 1.5 CM

Curies 6088 Ci<sup>60</sup>

Measured Output 97.4 (±3%) Rmm(ICRU)

Measurement Date JUNE 26 1985

Maximum Unit Output 112.6 (±5%) Rmm

Rated Capacity 122.05 Rmm(ICRU)

Survey Meter Berthold

Model RATOF

Serial No. 056996

Calibration Date 85-05-02

Supplementary Shielding: Donut ☐

Air Cylinder End ☐

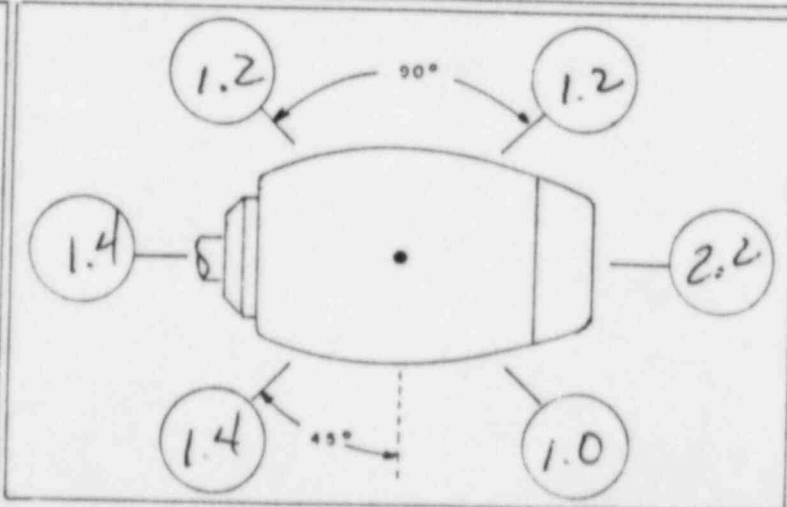
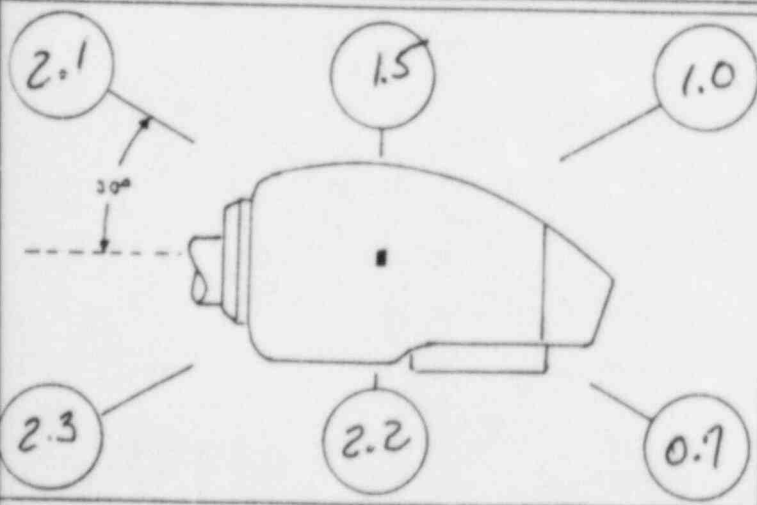
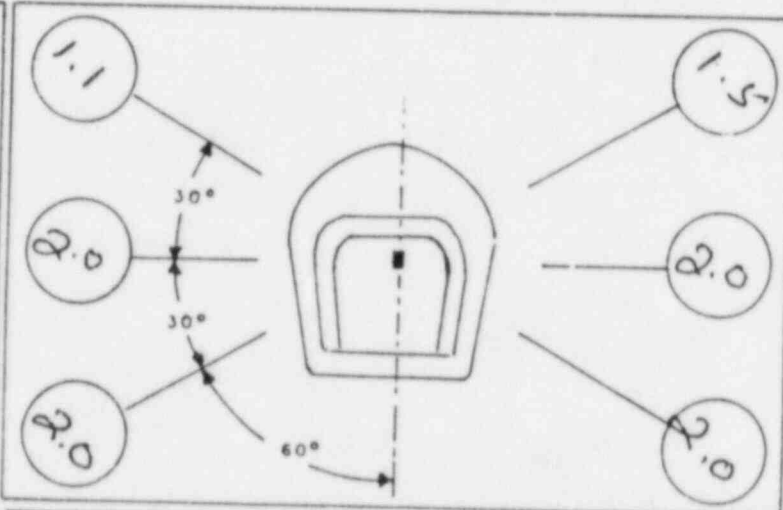
Other ☐

HEAD SURVEY PERFORMED BY J. J. Hilbert

Date 1 Aug 85

## NOTES

1. Values at each point are averaged over a 100 square centimetre area in accord with recommendations NCRP Report 33.
2. Values are in mR/h at 1 metre from the source.
3. This report is based on values measured at 18 points and is it is for compliance verification only. Report is not to be used as a substitute for comprehensive 26 point survey originally performed under controlled conditions at the factory in accord with recommendations NCRP Report 33.
4. Average of values at all 26 points is equal to, or less than, 2 mR/h.
5. No measured value exceeds 10 mR/h.



# SECTION 18.A.ii

The following table reflects the survey of the environs. This survey indicates that unrestricted areas are well below the stated limits in 10 CFR 20.105b.

Instruments Used: 1. Victoreen 470A; Model-P50-007; Serial-2504; Calibrated:3/85  
2. Victoreen 470A; Serial-1202; Calibrated:7/85  
3. Keithley 36105; Serial-18980; Calibrated:6/85

Survey performed by V. Yoder, Medical Physicist  
A. Bukovitz, Medical Physicist  
P. Clayton, Dosimetrist  
A. Maitz, Health Physicist

Survey was performed on August 2, 1985, using a randophantom, 80 SAD, and a 32cm x 32cm field. Source had been replaced on August 1, 1985. All readings are in the units of mR/hr. The areas surveyed were the roof above the teletherapy unit which is currently designated as a radiation area, the dock area at about 5 feet from the ground, the outside of the teletherapy room, the physics office and the accelerator room. Please see the diagrams for location numbers.

Even though the roof area above the teletherapy unit is designated as a radiation area, the beam will not be taken off the beam stop when oriented at the 180 degree angle setting.

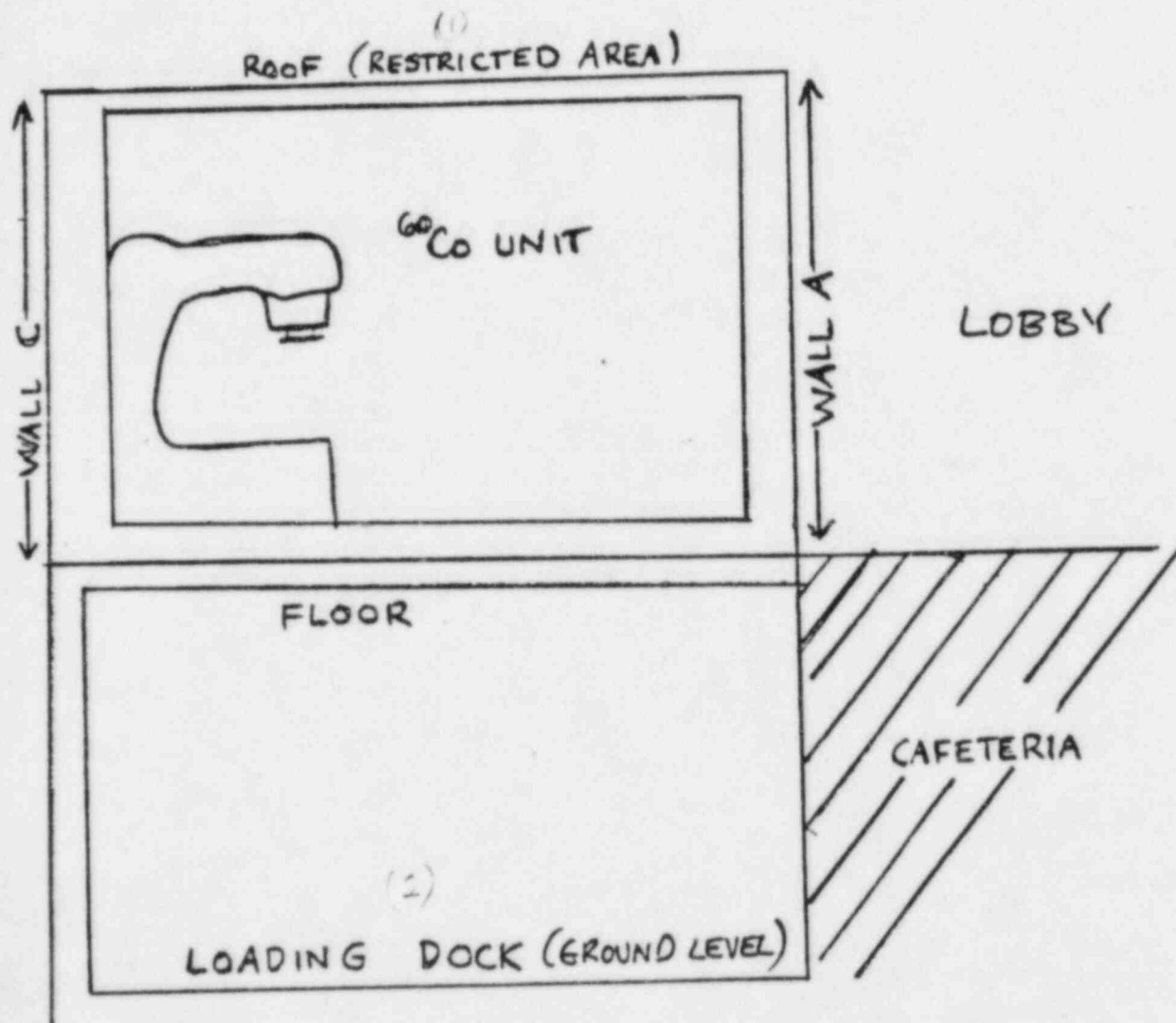
Gantry Angle Setting	Location	1	2	3	4	5
0		0.1	0.1	0.2	0.1	0
30		0.1	0.1	0.4	0.1	0
60		0.1	0.1	0.2	0.1	0
90		0.1	0.1	0.2	0.1	0
120		0.1	0.1	0.1	0.1	0
150	*(0.3)	0.3	0.4	0.5	0.1	0
180	*(0.3)	0.2	0.3	0.4	0.1	0
210	*(0.3)	0.3	0.5	0.5	0.1	0
240		0.1	0.2	0.9	0.1	0
270		0.1	0.1	1.1	0.1	0
300		0.1	0.2	0.7	0.1	0
330		0.1	0.1	0.8	0.1	0
0 off beamstop		0.1	0.1	0.2	0.1	0
0 off beamstop (no phantom)			0.1			

\*indicates comparative measurements performed between the Keithley and the Victoreen.

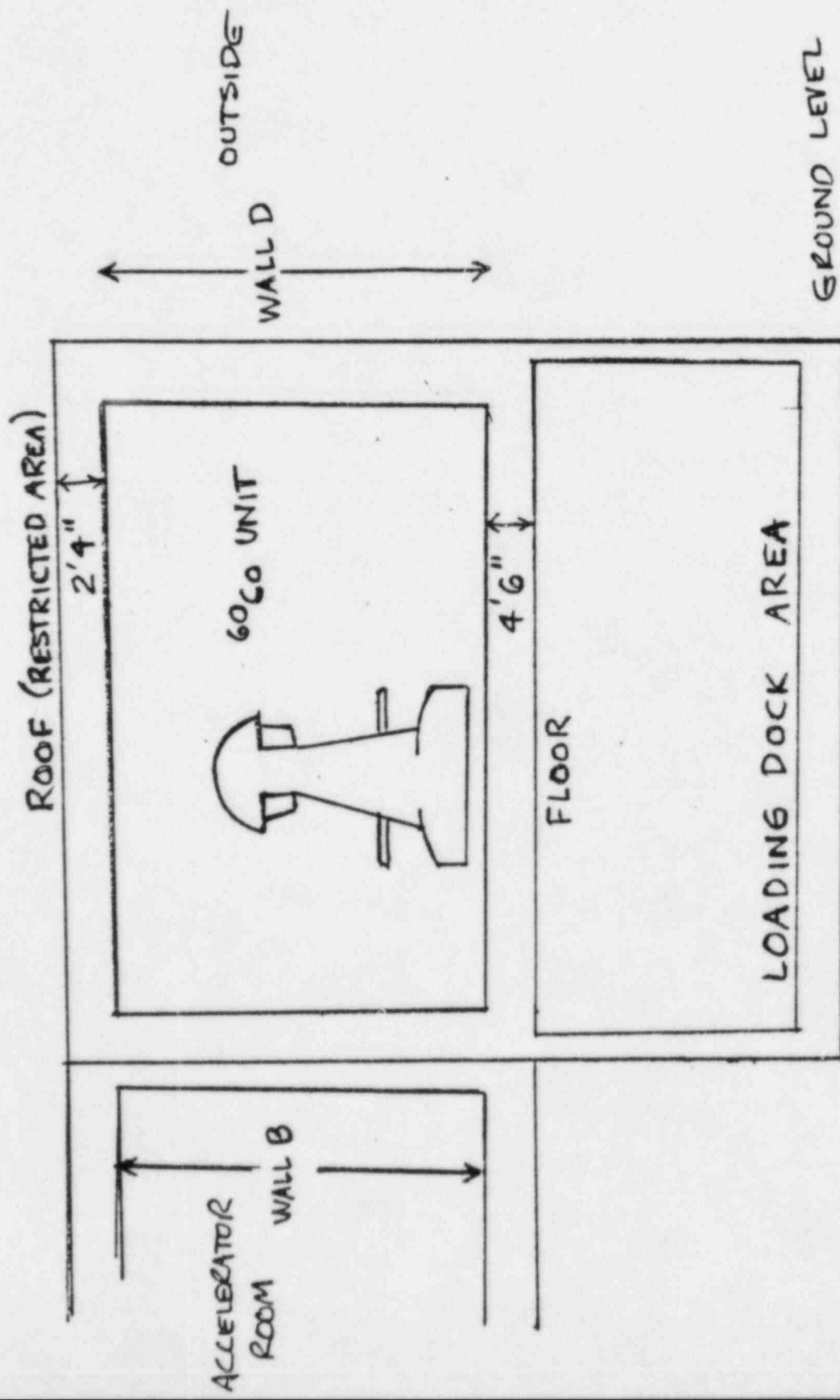
# SECTION 18.B.iii

The switches are set such that the source cannot be exposed when the head is rotated off the beamstop toward the south wall. This was tested during the 5 year inspection.

OUTSIDE

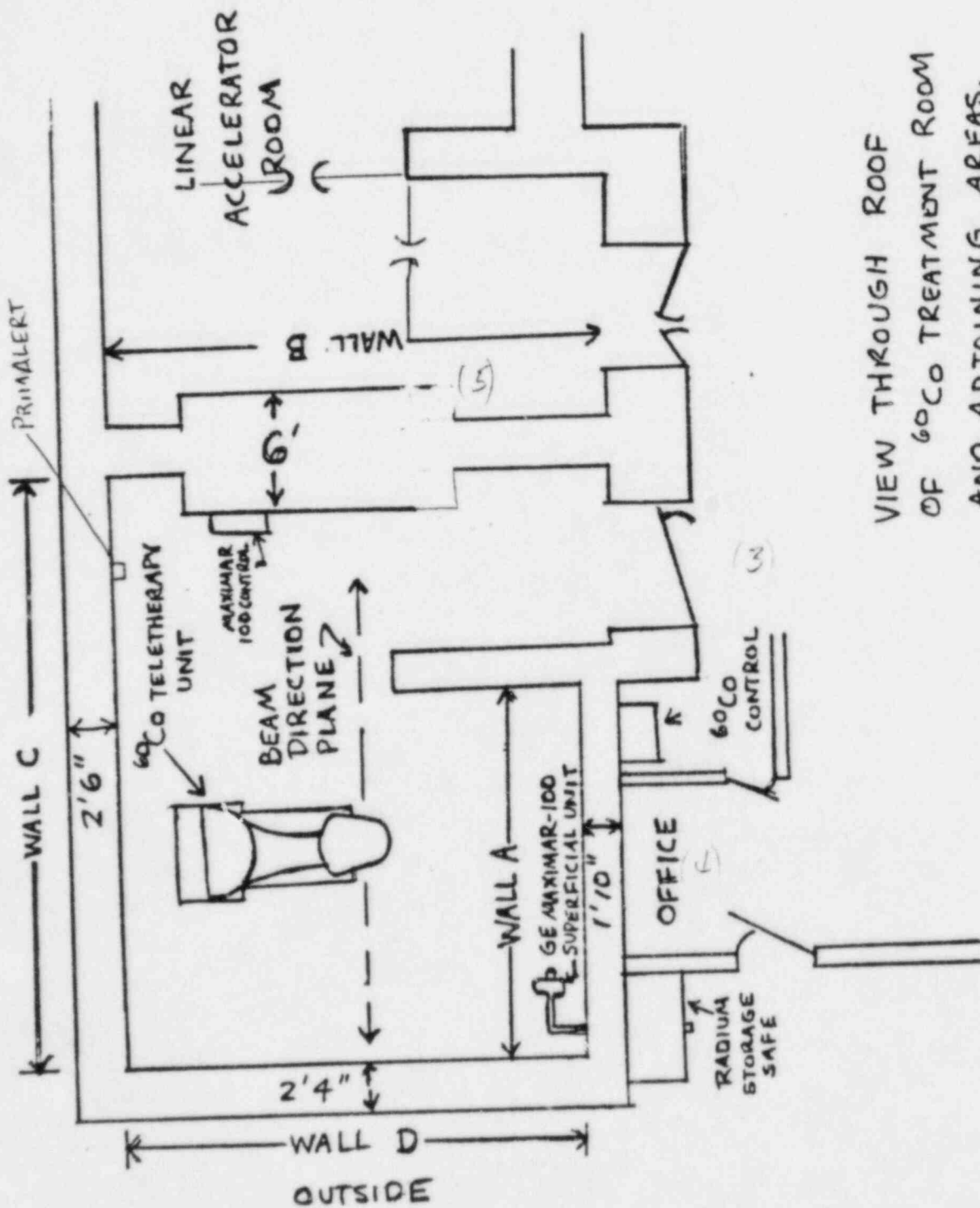


SIDE VIEW OF  $^{60}\text{Co}$  TREATMENT ROOM  
AND ADJOINING AREAS, AS SEEN THROUGH  
WALL D.

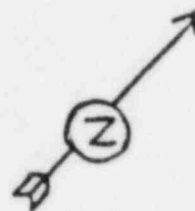


: REAR VIEW OF  $^{60}\text{Co}$  TREATMENT ROOM  
AND ADJOINING AREAS, AS SEEN THROUGH  
WALL C.

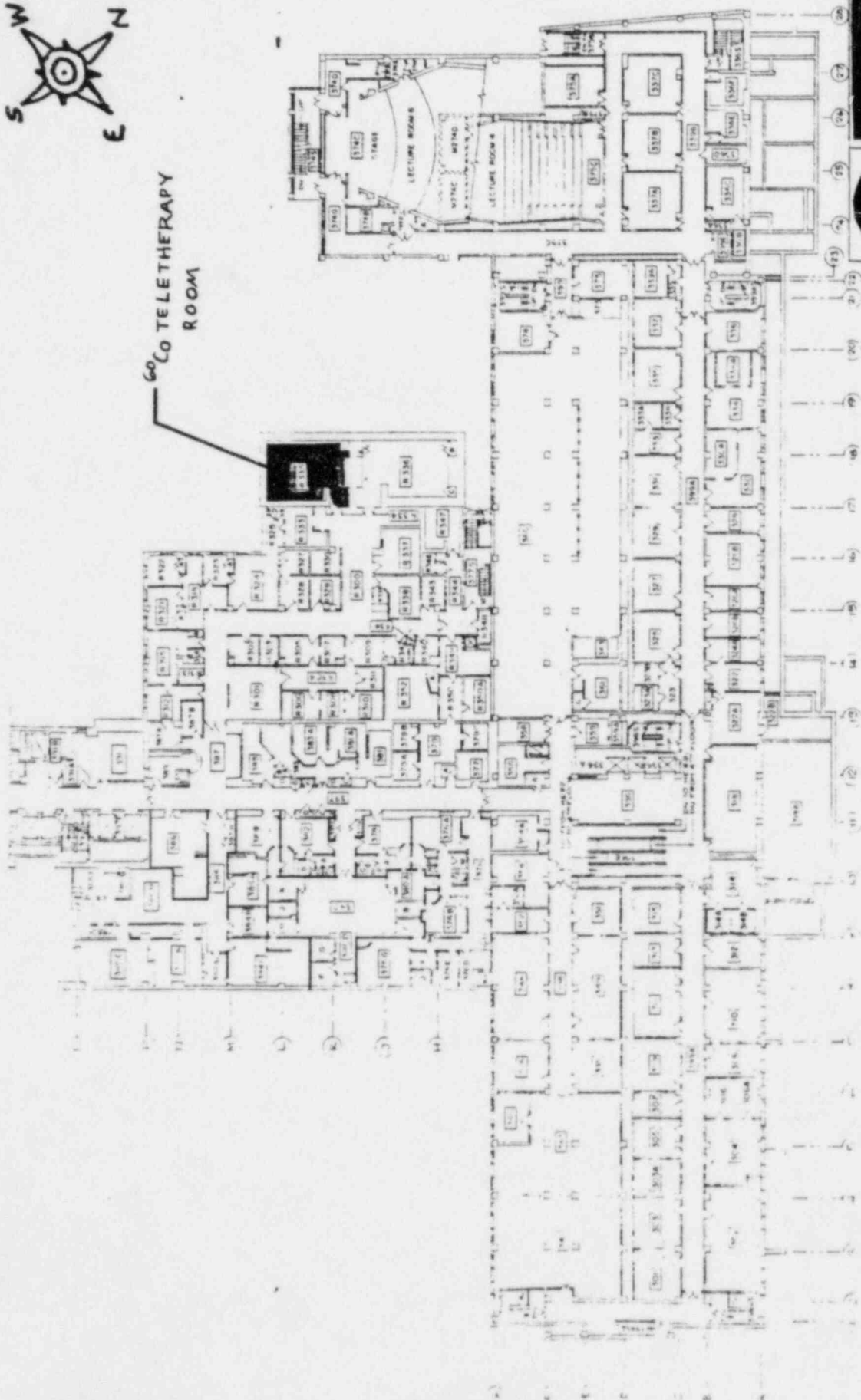
OUTSIDE



VIEW THROUGH ROOF  
OF 60Co TREATMENT ROOM  
AND ADJOINING AREAS.



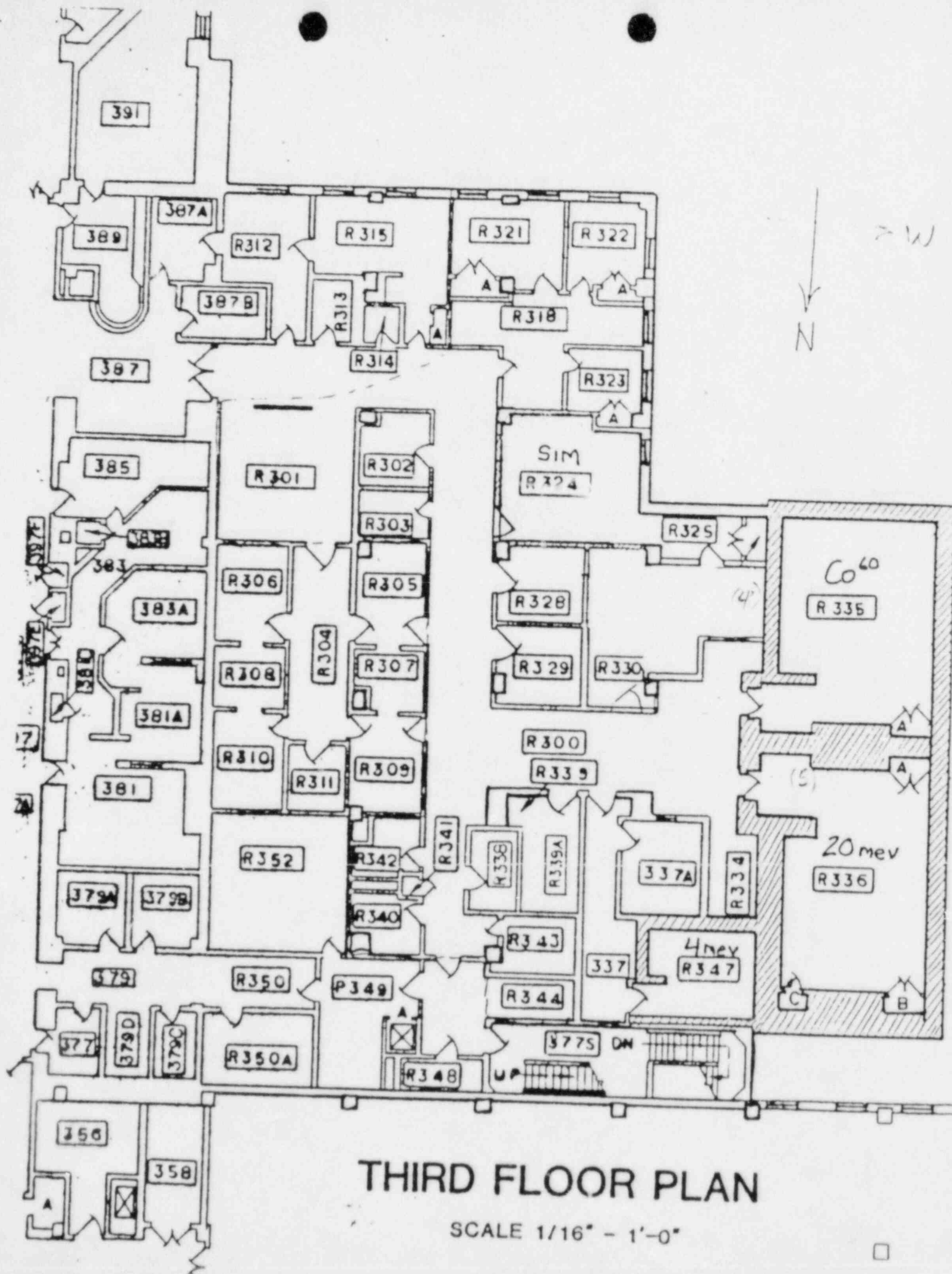
$^{60}\text{Co}$  TELE THERAPY  
ROOM



THIRD FLOOR PLAN

PHYSICAL PLANT INVENTORY  
SCAIFE HALL  
THIRD FLOOR PLAN





# THIRD FLOOR PLAN

SCALE 1/16" - 1'-0"



SECTION 18.B.iv

I. Measurement "in air" of primary beam exposure rate, timer error, collimator factors, tray and wedge transmission. Measured with Capintec RA<sup>2</sup>, Ser # 94C747 and Capintec PR-06C, 0.6 cc chamber, Ser # II. 62767, with Co-60 build-up cap.

Distance (SSD/SCD)	Field size (cm)	Timer setting	Electrometer reading:		Average reading	
			Integrator	Ratemeter		
80 cm (T-45)	10x10	1.00 min	147.2 147.0 147.8 147.8 147.4	147.7 147.5 147.6 147.7	147.6 <sub>s</sub>	
		4x0.25 min	133.0 133.2 133.0 133.0		133.0 <sub>s</sub>	
	4.5x4.5			145.9 <sub>s</sub>	.959	
	5x5			146.8 <sub>s</sub>	.965	
	6x6			148.0 <sub>s</sub>	.973	
	8x8			150.1	.986 <sub>s</sub>	
	10x10	(Average = 152.1)	152.2 <sub>s</sub> , 152.0 <sub>s</sub> , 152.1, 152.2 <sub>s</sub>		1.000	
	12x12			153.8 <sub>s</sub>	1.011	
	15x15			156.1	1.026	
	20x20			159.0 <sub>s</sub>	1.045	
	25x25			160.5 <sub>s</sub>	1.053	
	30x30			161.1 <sub>s</sub>	1.059	
	<u>Accessories</u>			Average reading	Transmission	Correction Factor
10x10	Nom - open field		152.2 <sub>s</sub>	152.2 <sub>s</sub>	1.000	1.000
	Single tray		145.8 <sub>s</sub>	145.8 <sub>s</sub>	.952	1.044
	Double tray		139.6	139.6	.917	1.091
	20° wedge 90°R (collimator)		112.9 <sub>s</sub>			
	20° wedge 90°L "		113.4 <sub>s</sub>	113.2	.743 <sub>s</sub>	1.345
	30° wedge 90°R		104.5 <sub>s</sub>			
	30° wedge 90°L		105.4 <sub>s</sub>	105.0	.690	1.450
	45° wedge 90°R		71.7			
	45° wedge 90°L		72.7	72.2	.474	2.109
	60° wedge 90°R		53.5			
	60° wedge 90°L		56.2	56.1 <sub>s</sub>	.369	2.711
20x20	Nom - open field		158.9 <sub>s</sub>		1.000	1.000
	Single tray		153.2 <sub>s</sub>		.964	1.037
	Double tray		147.1 <sub>s</sub>		.926	1.080

Distance (SSD/SCD)	Field size (cm)	Timer setting	Electrometer reading: Integrator	Rate meter	Average reading Relative exposure rate
80 cm (T-45)	10x10	Gantry angle = 0° Gantry angle = 90° Gantry angle = 180° Gantry angle = 270°		151.9 151.45 151.75 151.65	1.000 .997 .999 .998
82 cm (T-45)	15x15 (collimator) 15x7.5 = breast cone	Open field - without breast cone With breast cone (1/2 beam block) - plastic out of beam With breast cone - plastic in beam		148.15 150.95 148.35	1.000 1.019 / 1.000 1.001 / .983 → 1.018
100 cm (T-45)	12.5x12.5 (10x10 cm @ 80 cm)	1.00 mm	94.0 94.3 94.0		94.10 97.05

## II. Calculations

$T = 22.0^\circ$   $P = 743 \text{ mm}$  Air density correction = 1.023  
Chamber correction factor for Co-60 = 1.042

A. Timer error:  $e = \frac{133.05 - 147.60}{(4 \times 147.60) - 133.05} = -0.0318 \text{ min}$

B. Exposure rate: 1) at 80.0 cm (T-45) in air, 10x10 cm field, calculated for 8/15/85  
 $\frac{147.60}{0.968 \text{ min}} \times 1.023 \times 1.042 = 162.54 \text{ R/min (8/2/85)}$

Decay from 8/2 to 8/15/85 = 13 days = 0.9953

$162.54 \times 0.9953 = 161.77 \text{ R/min (8/15/85)}$

2) at 100 cm (T-45) in air, 12.5x12.5 cm field.

$\frac{94.10}{0.968 \text{ min}} \times 1.023 \times 1.042 = 103.62 \text{ R/min (8/2/85)}$

c. Calculation of dose rate (Calibration  $D_{max}$ ): rads/min in water, 80 cm SSD  
0.5 cm depth, 10x10 cm field.

Correction factors used to calculate from exposure rate at 80 cm:

- 1) Distance correction from 80.0 to 80.5 cm,  $\left(\frac{80.0}{80.5}\right)^2 = 0.9876$
  - 2)  $f$  (rads/R) = 0.967
  - 3)  $A_{10}$  = 0.989
  - 4) Backscatter factor for 10x10 cm = 1.035
- } from AAPM Protocol, TG-21

$$161.7 \text{ R/min} \times 0.9876 \times 0.967 \times 0.989 \times 1.035 = 158.14 \text{ rads/min (8/15/85)}$$

d. Comparison of measured exposure rate with A.E.C.L. stated output for source.

A.E.C.L. gives the output of this source as 112.6 R/min at 100 cm, with collimators fully open, on 6/26/85 (with source in a T-80 teletherapy head).

Decay 6/26 to 8/2/85 = 37 days = 0.9867

$$112.6 \text{ R/min} \times 0.9867 = 111.1 \text{ R/min (8/2/85)}$$

Our measured values must be corrected by the collimator factor (1.060) for a 32x32 cm field relative to a 10x10 cm (at 80 cm) field.

$$1) \text{ Measurement at 80 cm: } 162.5 \text{ R/min} \times 1.060 \times \left(\frac{80}{100}\right)^2 = 110.2 \text{ R/min} \quad \frac{\text{Measured}}{\text{A.E.C.L.}} = \frac{110.2}{111.1} = 0.99$$

$$2) \text{ Measurement at 100 cm: } 103.6 \text{ R/min} \times 1.060 = 109.8 \text{ R/min} \quad \frac{\text{Measured}}{\text{A.E.C.L.}} = \frac{109.8}{111.1} = 0.989$$

Agreement with A.E.C.L. value is well within their  $\pm 5\%$  variation limit.

## Peak Dose Factors and Isocenter Dose Factors

Field Size (cm)	Collimator Factor (T-45)	Backscatter*	Peak Dose** Factor	Isocenter** Dose Factor
4.5x4.5	0.959	1.017	0.942	0.938
5x5	0.964	1.018	0.948	0.943
6x6	0.972	1.022	0.960	0.951
7x7	0.980	1.025	0.971	0.959
8x8	0.986	1.029	0.980	0.965
9x9	0.993	1.032	0.990	0.971
10x10	1.000	1.035	1.000	0.978
11x11	1.005	1.038	1.008	0.983
12x12	1.011	1.041	1.017	0.989
13x13	1.016	1.044	1.025	0.994
14x14	1.021	1.047	1.033	0.999
15x15	1.026	1.049	1.040	1.004
16x16	1.031	1.052	1.048	1.009
17x17	1.035	1.054	1.054	1.013
18x18	1.039	1.056	1.060	1.016
19x19	1.042	1.058	1.065	1.019
20x20	1.045	1.059	1.069	1.022
22x22	1.050	1.062	1.077	1.027
24x24	1.054	1.065	1.085	1.031
26x26	1.056	1.067	1.089	1.033
28x28	1.058	1.069	1.093	1.035
30x30	1.059	1.071	1.096	1.036
32x32	1.060	1.072	1.098	1.037

COBALT-60 TELETHERAPY  
JROC/PUH  
AUGUST/1985

<u>FIELD SIZE</u> <u>(cm.)</u>	<u>*80 cm. SSD</u> <u>rads/min. @</u> <u>0.5 cm. depth</u>	<u>*ISOCENTER</u> <u>rads/min. @</u> <u>80 cm. in air</u>
4.5 x 4.5	149.0	148.3
5 x 5	149.9	149.1
6 x 6	151.8	150.4
7 x 7	153.6	151.7
8 x 8	155.0	152.6
9 x 9	156.6	153.6
10 x 10	158.1	154.7
11 x 11	159.4	155.5
12 x 12	160.8	156.4
13 x 13	162.1	157.2
14 x 14	163.4	158.0
15 x 15	164.5	158.8
16 x 16	165.7	159.6
17 x 17	166.7	160.2
18 x 18	167.6	160.7
19 x 19	168.4	161.1
20 x 20	169.1	161.6
22 x 22	170.3	162.4
24 x 24	171.6	163.0
26 x 26	172.2	163.4
28 x 28	172.8	163.7
30 x 30	173.3	163.8
32 x 32	173.6	164.0

Add 0.03 minute to all treatment times calculated from these dose rates.

All dose rates are with trimmers retracted (T-45).

NY 8-2-85  
9/25/85



RELATIVE EXPOSURE  
(COLLIMATOR FACTOR)  
AT 80cm (T-45) IN AIR

A.E.C.L. T-80 Co-60 TELETHERAPY

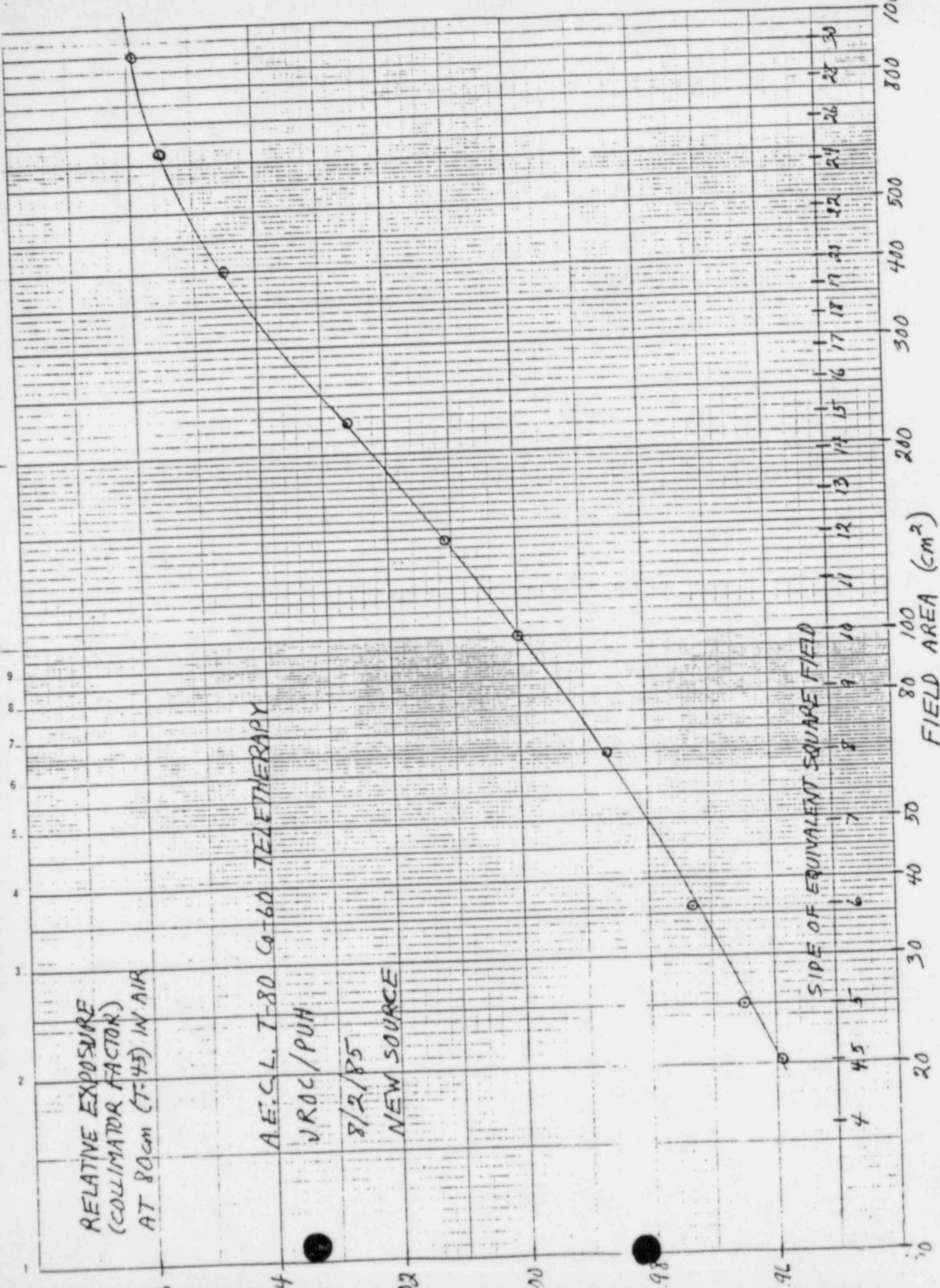
JROC/PUH

8/2/85

NEW SOURCE

SIZE OF EQUIVALENT SQUARE FIELD

FIELD AREA (cm<sup>2</sup>)





SECTION 18.B. i and ii  
COBALT 60 UNITS

On a daily basis prior to treatment of the first patient the following procedures must be performed and logged on each treatment unit. The items are listed in the order they should be performed.

1. With the gantry at 0 degrees check the accuracy of the optical distance indicator at the isocenter (80 SAD) using the mechanical front pointer. Limit of acceptance:  $\pm 3\text{mm}$ .
2. Check the coincidence of the lateral and sagittal lasers at the isocenter. Limit of acceptance:  $\pm 2\text{mm}$ .
3. Check for proper response of the room monitor with a check source. (If a check source is not available observe the operation of the monitor with the treatment unit on.) Unplug the room monitor and test the operation of the monitor's backup battery.
4. Check for proper operation of the TV-intercom system.
5. Check for proper operation of any "radiation on" indicators.
6. With the unit on terminate the exposure by opening the treatment room door. If opening the door does not terminate the unit close the door, terminate the unit at the control panel and notify physics. Also verify that the unit can not be turned on again until the door interlock is made again.
7. Listen for smooth delivery and return of the source.

### COBALT 60 UNITS

On a weekly basis perform the following:

1. Check for proper operation of any collision devices.
2. Ensure that any emergency off buttons are functional. If the unit has more than one, test each regularly.
3. Place a sheet of film (preferably ready-Pak verification film) on the treatment table. Set a 10 x 10cm field on the collimators. Place the plastic BB plate supplied by physics in the center of the light field. Set the plate to 80cm SSD. Expose and develop the film. Give the film to Physics. If a BB plate is not available, place the film at 80cm SSD and mark the corners and center of the 10 x 10cm light field then proceed as above.

COBALT UNIT NAME: PUH  
 QUALITY ASSURANCE FOR THE WEEK OF: 8/5/85  
 PERFORMED BY: V. DeWard  
 CHECKED BY: \_\_\_\_\_

PARAMETER	MONDAY			TUESDAY			WEDNESDAY			THURSDAY			FRIDAY			ACTION TAKEN
	S	I	U	S	I	U	S	I	U	S	I	U	S	I	U	
DISTANCE INDICATOR	✓			✓			✓			✓			✓			
LASERS	✓			✓			✓			✓			✓			
ROOM MONITOR	✓			✓			✓			✓			✓			
TV-INTERCOM	✓			✓			✓			✓			✓			
"RADIATION ON"	✓			✓			✓			✓			✓			
DOOR INTER-LOCK	✓			✓			✓			✓			✓			

WEEKLY	MONDAY			TUESDAY			WEDNESDAY			THURSDAY			FRIDAY			ACTION TAKEN
	S	I	U	S	I	U	S	I	U	S	I	U	S	I	U	
COLLISION DEVICES																
EMERGENCY OFF	✓															
LIGHT/RADIAL CONGRUENCE	✓															
MONITOR BATTERY	✓			✓			✓			✓			✓			

COMMENTS:

# DAILY Co-60 MONITOR CHECK

## PROCEDURE:

1. Unplug the monitor from the wall electrical outlet.
2. Turn Co-60 unit to "on" so that radiation is emitted.
3. Check to see that the monitor flashes red.
4. If the monitor functions properly, indicate so and initial.

If the monitor does not function properly, indicate so and initial.  
Call engineering to get the monitor repaired, and use a geiger counter to insure that the source has returned to the "off position each time that the unit has been used.

5. Plug the monitor back into the wall electrical outlet.

TE	MONITOR OK (Y or N)	INITIALS	DATE	MONITOR OK (Y or N)	INITIALS
8/1	<del>Y</del> Co Down				
8/2	<del>Y</del>				
8/5	y	D			
8/6	y	D			
8/7	y	D			
8/8	y	D			
8/9	y	D			
8/12	y	D			
8/13	y	D			
8/14	y	D			
8/15	y	D			
8/16		D			

BETWEEN: William O. Miller, Chief  
License Fee Management Branch  
Office of Administration

John E. Glenn, Chief  
Nuclear Materials Section B  
Division of Engineering and  
Technical Programs

LICENSE FEE TRANSMITTAL

A. REGION I

No Fee  
Needed - Teletherapy survey

1. APPLICATION ATTACHED

Applicant/Licensee: University of Pittsburgh

Application Dated: 8/16/85

Control No.: 04281

License No.: 37-00245-05

2. FEE ATTACHED

Amount: 0

Check No.: 0

3. COMMENTS

Signed Brenda Platchek

Date 8/22/85

02300

B. LICENSE FEE MANAGEMENT BRANCH

1. Fee Category and Amount: EX 7A

6/86

2. Correct Fee Paid. Application may be processed for:

Amendment ✓

Renewal       

License       

Signed Lita Jacques / 109

Date 9/5/85

OCT 19 1982



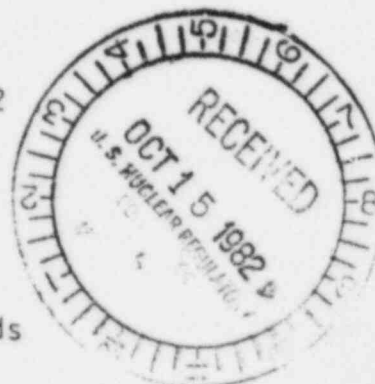
University of Pittsburgh

RADIATION SAFETY OFFICE

M6  
1643

October 6, 1982

U. S. Nuclear Regulatory Commission  
Materials Licensing Branch  
Division of Fuel Cycle and Material Safety  
Office of Nuclear Material Safety & Safeguards  
Washington, D.C. 20555



Re: Control Numbers 12307 and 12308

Attn: Francis A. St. Mary

Dear Sir:

Enclosed is our response to your request for additional information in support of our application associated with License #37-00245-05 and #37-00245-07.

Very truly yours,

E. D. Durkosh  
Radiation Safety Officer

cc: N. Wald, M.D. - Chairman, Radiation  
Safety Committee  
J. Parsons, M.D. - Director, Radiation Oncology

~~8571790517~~ 388

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It is your responsibility to notify this agency within 10 days of any changes.

BUREAU OF PROFESSIONAL AND  
OCCUPATIONAL AFFAIRS

P.O. BOX 1753  
HARRISBURG, PA 17105-1753

PHONE (717) 783-3650

COMMONWEALTH OF PENNSYLVANIA - DEPARTMENT OF STATE  
BUREAU OF PROFESSIONAL AND OCCUPATIONAL AFFAIRS

MEDICAL PHYSICIAN & SURGEON

CERTIFICATE NO.

MD-027027-E

ISSUED TO

BHARAT LHUSHAN MITAL  
830 CARRIAGE ROAD  
PITTSBURGH

EXPIRATION DATE

DEC 31 1982



DISPLAY THIS CERTIFICATE PROMINENTLY

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DEPARTMENT OF STATE

BUREAU OF PROFESSIONAL AND OCCUPATIONAL AFFAIRS

CLASSIFICATION

MEDICAL PHYSICIAN & SURGEON

VERIFICATION NUMBER

MD-027027-E

ISSUED

EXPIRES

JULY 1982 DEC 31 1982



BHARAT LHUSHAN MITAL  
830 CARRIAGE ROAD  
PITTSBURGH

ISSUED TO

FOR MORE INFORMATION, CONTACT THE BUREAU OF PROFESSIONAL AND OCCUPATIONAL AFFAIRS

It is your responsibility to notify this agency within 10 days of any changes.

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OCCUPATIONAL AFFAIRS

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HARRISBURG, PA 17105-1753

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BUREAU OF PROFESSIONAL AND OCCUPATIONAL AFFAIRS

MEDICAL PHYSICIAN & SURGEON

CERTIFICATE NO.

MD-027027-E

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SHARAT L. HUSHA  
830 CARRIAGE ROAD  
PITTSBURGH

EXPIRATION DATE

DEC 31 1982



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CLASSIFICATION

MEDICAL PHYSICIAN & SURGEON

CERTIFICATE NUMBER

MD-027027-E

ISSUED

JUL 10 1982 DEC 31 1982

EXPIRES



SHARAT L. HUSHA  
830 CARRIAGE ROAD  
PITTSBURGH

ISSUED TO

October 5, 1982

University of Pittsburgh  
ATTN: Mr. Ed Durkosh  
Radiation Safety Office  
Room A550 Crabtree Hall  
Pittsburgh, PA 15261

Dear Mr. Durkosh:

Enclosed please find a response to the NRC regarding calibration of our dosimetry systems and current medical license for Dr. Bharat Mittal.

With reference to Control Number 12307 and 12308 the following information is supplied:

Item 1. Enclosed please find copies of Dr. Mittal's current Pennsylvania Medical license.

Item 2a. The dosimetry systems were last calibrated as follows: Victoreen 570 electrometer and 621 Co-60 chamber on 6/25/80. Capintec Model 192 electrometers and Farmer Replacement chambers on 6/13/80.

In May of 1982, a telephone call was placed to the RCL at Victoreen Instruments to arrange a calibration date for the dosimetry equipment. It was learned that the Victoreen RCL was not taking any new orders and was closing its operation. Calibrations at other labs was also discussed and personnel at Victoreen advised at least a 6 month waiting period for routine calibrations was observed.

In July of 1982, a letter was written to the Memorial Hospital RCL asking for an available calibration date and cost of calibration. A form letter listing prices and directions for shipping equipment was received by us near the end of July. This letter was followed by another phone call to Memorial RCL to arrange a date for calibration. The waiting list extends to July, 1983. It is expected that the dosimetry equipment will be calibrated by July, 1983.

Item 2b. On June 18, 1982, an intercomparison of the dosimetry systems for License #37-00245-05 was conducted with another hospital's dosimetry system and Co-60 teletherapy unit as outlined in section 5.3.2 of NCRP No. 69. The other hospital's dosimetry system had an RCL Co-60 factor issued within the calendar year. All dosimetry systems measured the Co-60 beam exposure within  $\pm 1\%$  of one another using the RCL Co-60 factors assigned to each instrument at last calibration.

Until the dosimetry systems are recalibrated by a RCL, monthly constancy checks will be performed on a single dosimetry system at license #37-00245-05 using a 1 Ci. Co-60 irradiator (assayed 2/5/82) or a 20 Ci-Cs 137 irradiator (assayed 5/30/73) at the University of Pittsburgh Radiation Safety Office Laboratory as described in Section 5.3.1 of NCRP Report No. 69. Although a single system will be checked in any one month, the dosimetry systems at License no. 34-00245-05 will alternately be checked in the irradiators, i.e.

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one every other month. Other dosimetry systems at license no. 37-00245-05 and license no. 34-00245-07 will be compared in a Co-60 teletherapy beam with the system checked in the irradiator as described in Section 5.3.2 of NCRP Report No. 69.

At least annual intercomparisons of dosimetry systems of both licenses will be performed with other dosimetry systems in the area used for the calibration of Co-60 teletherapy units.

Sincerely,

*Robert F. Turco*

Robert F. Turco

RT:ps

08/30/82

University of Pittsburgh  
ATTN: Mr. E. D. Durkosh  
Radiation Safety Officer  
Room A550 Crabtree Hall  
Pittsburgh, PA 15261

Gentlemen:

This is in reference to your letter, dated August 9, 1982, to amend Byproduct Material Licenses No. 37-00245-05 and No. 37-00245-07. In order to continue our review, we need the following additional information:

1. The physician licenses for Dr. Bharat B. Mittal in Missouri and Illinois have expired. Please submit evidence that Dr. Bharat B. Mittal is licensed to practice medicine in a State or territory of the United States, the District of Columbia or the Commonwealth of Puerto Rico.
2. To grant an exemption to 10 CFR 35.23(a) we will need the following:
  - a. You should include supporting information such as when the dosimetry system was last calibrated, action taken to attempt to get the system recalibrated in accordance with the regulations and the date by which the system will be recalibrated.
  - b. Describe in detail the steps that have been (and will be) taken to ensure the constancy of the calibration of the dosimetry system.

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OFFICE						
SURNAME						
DATE						



We note that Section 5.3 of NRCR Report 69 describes several constancy test procedures and states that the response of a dosimetry system "shall be verified by at least one of the constancy tests...shortly before and after an intercomparison or the assignment of chamber calibration factors by a standardizing laboratory, and at least monthly thereafter." Note that the same section also requires recalibration and reassignment of chamber calibration factors if the user observes changes in instrument response that are greater than the fluctuations usual for the instrument. It is our understanding that, if this latter situation were to occur, NBS and/or the existing Regional Calibration Laboratories would try to make arrangements to calibrate a dosimetry system on an "emergency" basis.

We will continue our review of your application upon receipt of this information. Please reply in duplicate and refer to Control Numbers 12307 and 12308.

Sincerely,

Francis A. St. Mary  
Material Licensing Branch  
Division of Fuel Cycle and  
Material Safety

OFFICE	FCMLB					
SURNAME	FAST Mary					
DATE	08/30/82					





# University of Pittsburgh

RADIATION SAFETY OFFICE

August 9, 1982

Director of Nuclear Material Safety  
and Safeguards  
Materials Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Sir:

This letter requests an amendment to condition #12 of both teletherapy NRC licenses #37-00245-07 and 37-00245-05 held by the University of Pittsburgh. Delete the names of Muhammad Ali Afridi, M.D., and Vincent Sau Tak Cheng, M.D., and add Bharat B. Mittal, M.D., and Craig Lyle Silverman, M.D., on each license. A Curriculum Vitae for each added physician is attached.

We also request a waiver of the 2-year rule for calibration of dosimetry systems as required by 10 CFR 35.23 (a) because of both the scarcity of, and waiting period associated with, approved calibration facility services. Negotiations are under way to arrange acceptable regulatory required facility calibration to satisfy the NRC regulation, but it appears that our dosimetry calibration will exceed the less than 2 year period requirement. We are therefore requesting a period of four (4) years within which to accomplish the required dosimetry system calibration. In the meantime, we shall cross-calibrate using direct intercompareson as specified under 10 CFR 35.23 (b).

Very truly yours,

**FEE EXEMPT**

E. D. Durkosh  
Radiation Safety Officer

Attachments (2)

cc: N. Wald, M.D. - Chairman, Radiation Safety Committee  
H. Dorsey - Senior Vice Chancellor's Office for the  
Health Sciences

cc: A. Bukovitz - Presbyterian University Hospital  
V. Yoder - Magee Womens Hospital  
J. Turco - Joint Radiation Oncology Center

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6 pp.

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ACTION AND ENFORCEMENT

12308

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CURRICULUM VITAE

NAME: Bharat B. Mittal

DATE OF BIRTH: February 2, 1952

SEX: Male

MARITAL STATUS: Married

CHILDREN: None

VISA STATUS: Permanent Visa

PRESENT ADDRESS: 18 South Kingshighway, Apt. 10 K, St. Louis, MO 63108

ECFMG: Passed 1976

FLEX: Passed in Illinois, 1978

MEDICAL LICENSURE: Missouri - 1980  
Illinois - 1978

EDUCATION: Bachelor of Science (B.S.) June, 1969  
M.B.B.S. (Equivalent to M.D. in U.S.A.) Punjab University  
Ludhiana, India

INTERNSHIP: Flexible Internship in Ophthalmology, E.N.T., Anesthesia,  
Neurosurgery, Dermatology, Internal Medicine and Community  
Health, February 1, 1974 to December 31, 1974. Christian  
Medical College and Hospitals, Ludhiana, India.

RESIDENCY: (Internal Medicine) January 1, 1975 to December 31, 1976  
Christian Medical College and Hospitals, Ludhiana, India  
  
(Radiation Oncology) July 1, 1977 to June 30, 1980  
(PGY-1 to PGY-3) at Northwestern University, Chicago, IL  
  
(PGY-4) July 1, 1980 to June 30, 1981  
Mallinckrodt Institute of Radiology, Washington University,  
St. Louis, Missouri

FACULTY APPOINTMENT  
PRESENT STATUS: Assistant Radiation Oncologist, Mallinckrodt Institute of  
Radiology, Washington University, St. Louis, Missouri

SPECIALITY BOARD  
CERTIFICATION: Certified American Board of Radiation Oncology June, 1981

SOCIETIES American Society of Therapeutic Radiologists.  
  
Barnes Hospital Society.

ML10

"OFFICIAL RECORD COPY"

11/18/81

PUBLICATIONS:

1. Mittal, B., Oyasu, R., Brand, W.N., Sequential Bilateral Germ Cell Testicular Tumors of Different Cell Types, Cancer Vol. 48, No. 2, p. 367-369, 1981.
2. Mittal, B., Oyasu, R., Brand, W.N., Pure Seminoma, International Journal of Radiation Oncology Biology and Physics, Vol. 7, 649-651, 1981.
3. Mittal, B., Letter to Editor: Treatment of SVC Syndrome, New England Journal of Medicine, Vol. 302, No. 1, Page 61.

MANUSCRIPTS IN PREPARATION:

1. Mittal, B., Marks, J.E., Ogura, J., Transglottic Carcinoma. Review of 152 Patients. Submitted for publication.
2. Mittal, B., Rao, D.V., Early Glottic Carcinoma. Review of 179 patients.
3. Mittal, B., Wasserman, T.H.: Gastric Lymphoma. Review of 40 patients.

Currently working on: Effect of Sequential Radiation and Heat on RIF Tumor in C<sub>3</sub>H Mice.

PRESENTATIONS:

- "Transglottic tumors" - Jan 15, 1982, Wayne State University, Detroit.
- "Transglottic tumors" - Jan 27, 1982, St. Louis University, St. Louis, MO.
- "Transglottic tumors" - March 15, 1982, American Radium Society, San Antonio, Texas.

# The American Board of Radiology

Organized through the cooperation of the  
American College of Radiology, the American Roentgen Ray Society,  
the American Radium Society, the Radiological Society of North America,  
the Section on Radiology of the American Medical Association  
and the American Society of Therapeutic Radiologists

Hereby certifies that

**Bharat R. Mittal, M.D.**

Has pursued an accepted course of graduate study  
and clinical work, has met certain standards and qualifications and  
has passed the examinations conducted under the authority of

*The American Board of Radiology*

On this fifth day of June, 1981

Thereby demonstrating to the satisfaction of the Board  
that he is qualified to practice the specialty of

**Therapeutic Radiology**



*Harold S. Jacobson, M.D.*  
Secretary

*Samuel H. F. Jacobson, M.D.*  
Secretary

Curriculum Vitae

Personal: Birthdate: May 21, 1952  
Birthplace: Chicago, Illinois  
Citizenship: U.S.A.

Education: University of Illinois 1970-1974 B.S., Biology  
Urbana, Illinois  
Northwestern University 1974-1978 M.D.  
Chicago, Illinois

Internship: Barnes Hospital 1978-1979  
(Rotating) St. Louis, Missouri

Residency: Mallinckrodt Institute of Radiology 1979 to present  
Division of Radiation Oncology  
St. Louis, Missouri (514)-454-2154  
Director: Carlos A. Perez, M.D.

Position: Chief Resident 1980-1981  
1981-1982

Licensure: Missouri, R-0488  
Illinois, 036-059432  
Federal DEA Number: AS-8784692

Professional Societies: American Society of Therapeutic Radiologists, Junior Member  
Radiological Society of North America, Member in Training

Publications:

1. Prognostic Significance of Contrast Enhancement in Lowgrade Astrocytomas of the Adult Cerebrum, Radiology, April 1981.
2. Slipped Capital Femoral Epiphysis in Irradiated Children - Age, Dose, Volume Relationships. To be published in the International Journal of Radiation Oncology Biology and Physics, September 1981.
3. Cutaneous Hodgkin's Disease. Accepted for publication Archives of Dermatology.

Papers Given:

1. Prognostic Significance of Contrast Enhancement in Lowgrade Astrocytomas of the Adult Cerebrum. RSNA, November 1979, Atlanta, Georgia.
2. Slipped Capital Femoral Epiphysis in Irradiated Children - Age, Dose, Volume Relationships. ASTR, October 1980, Dallas, Texas.
3. Medulloblastoma. ASTR, October 1981, Miami, Florida.

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Cincinnati, Ohio  
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Philadelphia, Pennsylvania

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Tampa, Florida

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Philadelphia, Pennsylvania

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KAHLER EAST

ROCHESTER, MINNESOTA

55901

PHONE (507) 282-7838

July 6, 1982

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Detroit, Michigan

Paul A. Rasmussen, M.D.  
Santa Barbara, California

### TO WHOM IT MAY CONCERN:

This is to verify that Craig Lyle Silverman, M.D. was certified  
in Therapeutic Radiology June 4, 1982. Our certificates do not bear  
numbers.

(Mrs.) Lila Rogers  
Secretary to C. Allen Good, M.D.

lvr

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