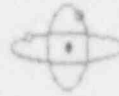


THE FAIRFAX HOSPITAL



RADIATION PHYSICS SERVICES

3300 Galloway Rd., Falls Church, Va. 22046 ph. 698-3394

Teletherapy Report

Department of Radiation Oncology

The Fairfax Hospital
3300 Galloway Road
Falls Church, Va. 22046

Date: submitted May 24, 1988
(per NRC request as followup
to letter and report
of January 18, 1988.)

8810130279 880817
REC2 LIC30
45-17128-03 PNU

Facility Survey Report

A. Survey Site: Teletherapy treatment room in the Department of
Radiation Oncology, The Fairfax Hospital
3300 Gallows Road, Falls Church 22046

NRC Teletherapy License No. 45-17128-01

B. Survey Performed By: James A. Deye, Ph.D.
Certified Radiological Physicist,
TFH, 3300 Gallows Road
Falls Church, Va. 22046

C. Reason for Survey: Installation of new source per requirements of
35.636, 35.641 and 35.645

D. Source Installation Date: January 15, 1988

E. Survey Date(s): January 15 through January 18, 1988

F. Survey Equipment:

1. Victoreen Model 470 A Survey Meter calibrated on 2/8/87 by
Radiation Service Organization, 5204 Minnick Road, Laurel Md. 20707
2. Nuclear Enterprises 0.6 CC Farmer Type Chamber (2571; sn 1251)
2570A/S2 (sn 673) Electrometer calibrated in May 1987 with a
Cobalt 60 source at K & S Associates Regional Calibration Lab.
(Nashville, Tenn.)

G. Teletherapy Unit: Manufacturer: CGR, model no. ALCYON II (sn 5.21)

H. Teletherapy Source: Man. CEA (Atomic Energy Commission of France)
model no. COT-20; sn 3415

I. Source Activity: 6507 Curies on Jan. 15, 1988

J. Primary Beam Output: 7584 rad/hr in air at 1 meter with a
10 x 10 cm. field measured after the source
had been installed in the head of the
teletherapy unit. Date of measurement:
Jan. 15, 1988

K. Head Leakage:

At one meter from the source in the "off" position the maximum radiation
level measured was 1.0 mR/hr. The average radiation level, 0.4mR/hr was

obtained by averaging measurement taken at 14 points on the surface of a sphere one meter in radius centered on the source. (See diagram in Figure F-1, page 4)

✓ Beam Orientation:

There are no mechanical or electrical stops installed or functioning to restrict gantry angle. The teletherapy head can be moved 360° from the vertical in either direction.

Survey of Adjacent Areas:

Areas adjacent to the treatment room were surveyed (see Attachment II). Based on these measurements it is concluded that the exposure levels are well below the maximum permissible levels.

✓ Door Interlock:

The interlock on the door to the teletherapy room was tested and found to operate properly. With the source in the "off" position and the door open, the source could not be placed in the "on" position. With the source in the "on" position and the door closed, opening the door made the source return to the "off" position and caused the "fault" signal to light and sound and the timer to stop. The source could not be returned to the "on" position until the door was closed and the system was reset at the control panel.

✓ Teletherapy "on-off" indicators:

The teletherapy source "on-off" indicators, located at the source housing, the teletherapy room door, and the control panel, were observed to be functioning properly, that is, the light on the source housing and the door, and the red light on the control panel were all activated when the source came on and stayed activated continuously while the source was on and they deactivated concomitantly with the source going off. A Nuclear Associates Primalert 10 Radiation detector, visible through the teletherapy room door, flashed red when the source came on and did not flash when the source was off. This detector was used to confirm the "on-off" status of the source.

✓ Beam Stops

There are no mechanical or electrical stops which limit the use of the primary beam.

Teletherapy Treatment Timing Device:

The timer on the console was checked with a stopwatch and found to be accurate and linear within 1% from 30 sec. to 5 minutes. Also, it was observed that when the timer reached the preset time the source shut off and could not be returned to on until the timer was reset.

(Source in "OFF" position.
 Measurements taken one meter
 from source)

Top View-Showing
 orientation
 of Views A through D

Position No.	Radiation Level (mr/hr)
View A	1 1.0
	2 0.7
	3 0.5
	4 0.7

View B	5 0.3
	6 0.1
	7 0.1
	8 0.35

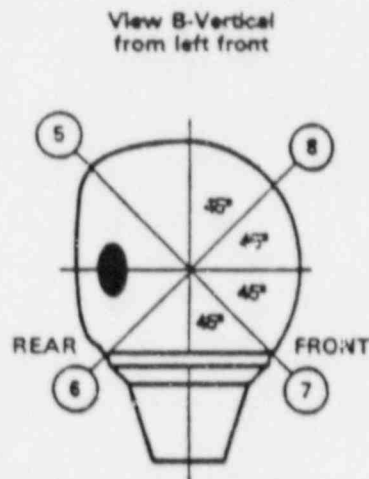
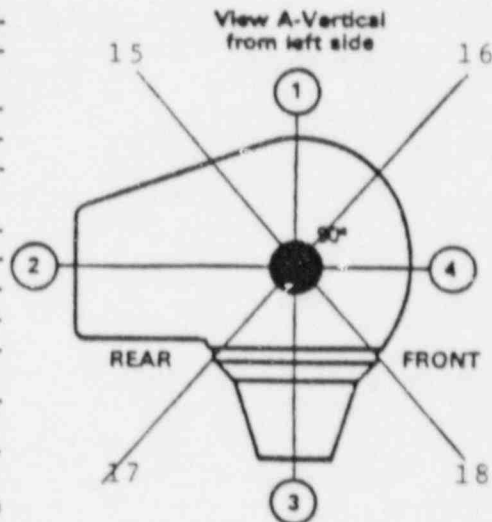
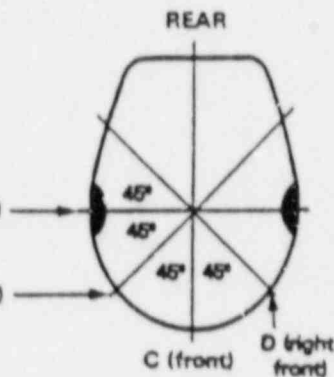
View C	9 0.55
	10 1.05

View D	11 0.2
	12 0.12
	13 0.02
	14 0.08

Average value 0.42

Maximum value 1.05

View A	15 0.6
	16 0.6
	17 0.6
	18 0.05



Date of survey 1/15/88

Instrument used Victoreen 450

View C-Vertical
 from front

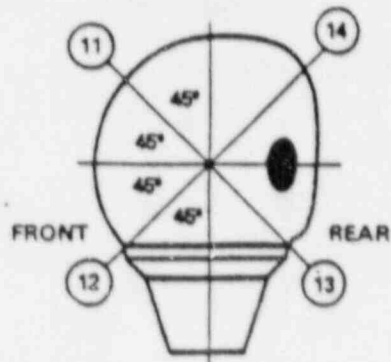
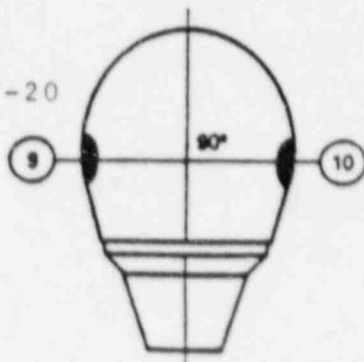
View D-Vertical
 from right front

Manufacturer's
 name & model number CGR CEA COT-20
 of teletherapy source

Date of installation 1/15/88

OUTPUT 132.2 ☐ RHM
☒ RMM

Date of output
 measurement 1/15/88



Area Radiation Survey of
CGR ALCYON II TELETHERAPY FACILITY
The Fairfax Hospital

Source : Co-60 6507 Ci on Jan. 15, 1988, Mod. no. COT-20 sn 3415
Phantom : 25 cm. cube, polystyrene
Source to phantom distance : 67.5 cm.
Field size (maximum) : 32 cm. x 32 cm.

Phantom	Yes (Y) No(N)	Gantry Angle (°)	Location	Reading (mR/hr)
N		270°	A. dressing room	0.8
N		90°	C. window (max)	1.0
N		90°	C. door (max)	0.6
N		90°	C. wall (max)	<0.2
N		180°	E. outpatient entrance (max)	0.2
Y		270°	A. dressing room (max)	0.5
Y		270°	B. control panel	<0.2
Y		270°	C. window	0.4
Y		270°	C. door	0.3
Y		90°	C. window (max)	3.0
Y		90°	C. door (max)	2.0
Y		90°	C. wall (max)	<0.2

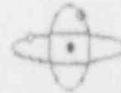
Notes :

1. 0° is toward floor
2. 270° is toward south wall
3. Readings taken inside the second set of doors
4. All measurements made with Victoreen 470 A Survey Meter
5. See Fig. 3 and 4 (page 7 & 7a) for location of measurements
6. Locations A,B, and C are controlled areas, location E is uncontrolled
7. Measurements cited are the maximum levels in the areas for the particular orientation of the beam unless otherwise stated as average

Conclusion :

Based on these measurements, radiation levels in all areas are less than 3 mR/hr. It is concluded that the maximum permissible exposures will not be exceeded.

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RADIATION PHYSICS SERVICES

3300 Galloway Rd., Falls Church, Va. 22046 ph. 698-3394

To : Teletherapy File

From: Debra Bruno, Radiation Safety Technician

Date: January 15, 1988

Subject : Leak Test of Co-60 Teletherapy Source

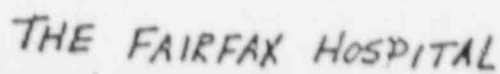
In compliance with Nuclear Regulatory Commission Teletherapy License No. 45-17128-03, the Co-60 source was tested for leakage upon installation of a new source on January 15, 1988. Test samples were taken from all accessible surfaces of the source in the "off" position. samples were taken using cotton tipped swabs soaked in alcohol and were counted in an Atomics Products Corporation NaI (Tl) well crystal.

Results of these test indicate that no removable activity at or above the 0.05 uCi limit was present. The minimum detectable activity of the test was 0.00007uCi of Co-60.

$$\text{Minimum detectable activity} = \frac{3 \sqrt{B}}{S/A_s}$$

where B = average background count per minute
S = standard source count per minute
A_s = activity of standard source on date of test

cc. James A. Deye, Ph.D. Radiological Physicist



EXIST. OUTPATIENT ENTRANCE VESTIBULE

MAIN
ASC F.

(D)

(E)

FOR EQUIPMENT & CABLEWORK SEE ELEV (9/3223)

CHG ON MTL FUR.

ISOCENTER

WIN
LGT
SEE

WD

4' V

350'-
GLASS
VIF I

FIG. 4

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