



MANSFIELD GENERAL

YOUR HEALTH CARE CENTER IN NORTH CENTRAL OHIO

August 5, 1987

U.S. Nuclear Regulatory Commission
Material Licensing Section
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Renewal of NRC License #34-02007-02

We request renewal of our teletherapy license #34-02007-02 in its entirety.

Enclosed is renewal fee of \$350.00.

If there are any questions concerning this renewal request, please contact either Joel E. Kaye, M.D., (419) 526-8619 or David Chin, Ph.D., (419) 526-8622.

Sincerely,

James E. Meyer

James E. Meyer
President

JEM:nf
Enclosure

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Check No.	8350
Amount	350
Fee Code	2A
Type of	Ren
Date	8/12/87
To	

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34-02007-02 PNU

CONTROL NO. 83963

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REGION III

MANSFIELD GENERAL HOSPITAL/335 Glessner Ave./Mansfield, OH 44903-9989/(419) 526-8000

Approved by Joint Commission on Accreditation of Hospitals

VHA.

Member of the Voluntary
Hospitals of America System.

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FEE MGMT. BRANCH

78220
AUG 6 1987

FGH

Fields, Griffith, Hubbard
and Associates, Inc.

1141 Hohlfelder Road
Glenview, Illinois 60022
312 835-4433

Certified
Radiation
Physicists

Western Regional Office
2483 Whippoorwill
Las Vegas, NE 89121
702 731-6446

Theodore Fields M.S. FACR, CHP
Charles H. Griffith M.S. FACR
Lincoln B. Hubbard Ph.D. MACR, CHP
Michael V. Broadbent Ph.D. MACR
Francis E. Gannon M.S.

January 31, 1985

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LIC. FEE MGMT. BRANCH

U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region III - 799 Roosevelt Road
Glen Ellyn, Illinois 60137

RE: License #34-02007-02

Dear Sir,

On January 5, 1985, a new cobalt 60 source was installed in the TEM unit at Mansfield General Hospital.

Enclosed please find copy of the survey report, calibration and related papers pertaining to the unit inspection and reconditioning.

The above material is to fulfill the requirements of condition 18 of the above license.

Yours truly,

Charles R. Griffith
Charles R. Griffith, M.S., F.A.C.R.

CG/mg

cc: Joel Kaye, M.D.
335 Glessner Avenue
Mansfield General Hospital
Mansfield, Ohio 44903

Marvin Turkanis
Neutron Products, Inc.
22301 Mt. Ephraim Road, Box 68
Dickerson, Maryland 20753

RECEIVED BY LFMS	
Date	2/14/85
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By	g
Chg	
Admin Comp	2/14/85

FEE EXEMPT
RECEIVED *tt survey report*
FEB 08 1985
REGION III

CONTROL NO. 78270

FEB 8 1985

8505030384 850419 14
REQ 3 IC30
34-02007-02 PDR

TELETHERAPY SURVEY REPORT

Table I

- 1 Institution: Name Mansfield General Hospital
 Address 335 Glessner Avenue
 City Mansfield State Ohio Zip 44903
 N.R.C. License # 34-02007-02
- 2 Surveyor: Name Charles E. Griffith, M.S., F.A.C.R.
 Address 1141 Mohlfelder Road
 City Glencoe State IL Zip 60022
 Certification Amer. Board of Radiology
- 3 Telotherapy Unit: Mfr TEM Model Stabilatron Serial 114
 Teletherapy Source: Mfr Neutron Products Model NEI-20-5000W
- 4 Date of Source Installation 1-5-85
- 5 Date of Survey 1-6-85
- 6 Survey Instruments: Mfr Model Cal. Date Cal Method
- | | | | |
|------------------|--------------------|-----------------|------------------------------|
| <u>Victoreen</u> | <u>570</u> | <u>9-13-84</u> | <u>RCL Madison</u> |
| <u>Victoreen</u> | <u>621 Chamber</u> | <u>9-13-84</u> | <u>RCL Madison</u> |
| <u>Victoreen</u> | <u>440</u> | <u>11-14-84</u> | <u>Health Physics Assoc.</u> |
- 7 Source Strength: Curies 5060 Date 2-1-85
- 8 Output: R/min 112.3 at 80 cm for 10 X 10 field on 1/6/85
- 9 Leakage Radiation: See Table II
- 10 Beam Orientation Limits & Method of Limitation
- From vertical to 110° to NE
- From vertical to 20° to SW
- Electrical interlocks control limitations.
- 11 Maximum Radiation Levels, Adjacent Areas, Rotation With Beam Stop (~~See Table III~~) ^{Not applicable.}
- 12 Maximum Radiation Levels, Adjacent Areas Without Beam Stop (~~See Table III~~) ^{See attached.}
- 13 Check List, Mechanical Functions:
- a) Door Interlock OK
- b) Source "on-off" indicators; mechanical OK, lights OK
- c) Beam Stops functioning properly OK
- d) Timer functions properly OK

SEE PROTOCOLS
ATTACHED

CONTROL NO. 78270

Primalert 10 installed and
functioning.

Figure F-1 TELETHERAPY HEAD SURVEY

(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 <u>1.2</u>
	2 <u>0.3</u>
	3 <u>3.8</u>
	4 <u>0.5</u>

View B	5 <u>0.2</u>
	6 <u>0.2</u>
	7 <u>0.2</u>
	8 <u>0.2</u>

View C	9 <u>0.4</u>
	10 <u>0.4</u>

View D	11 <u>0.2</u>
	12 <u>0.2</u>
	13 <u>0.2</u>
	14 <u>0.2</u>

Average value 0.59

Maximum value 3.8

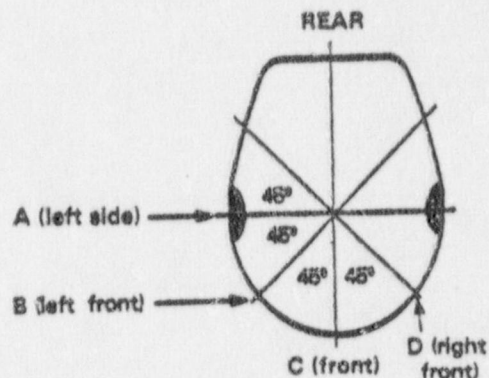
Date of survey 1-6-85
Victoreen 440
Instrument used Cal. 11-14-84

Manufacturer's
name & model number
of teletherapy source NPI -20-5000W

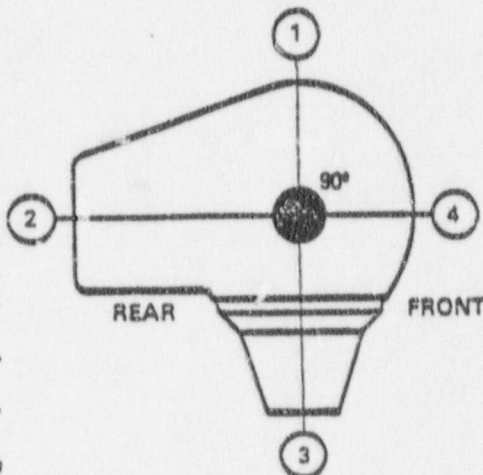
Date of installation 1-5-85

OUTPUT 5414 ☒ RHM
☐ RMM

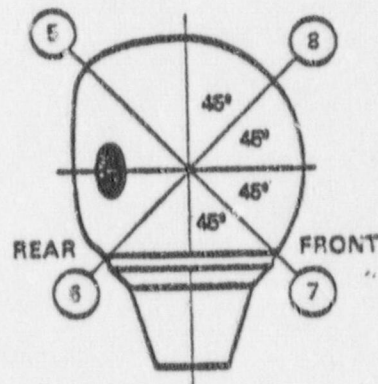
Date of output
measurement 1-6-85



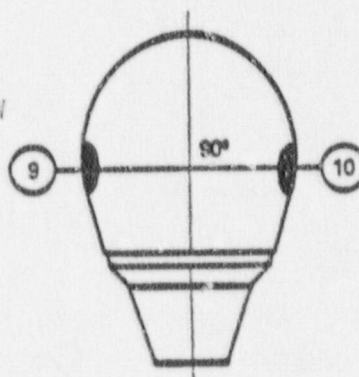
View A-Vertical
from left side



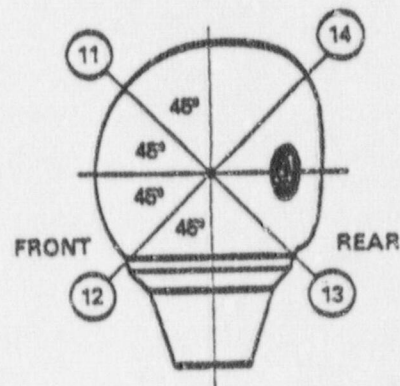
View B-Vertical
from left front



View C-Vertical
from front



View D-Vertical
from right front



Certificate of Standardization of X-Ray Machine

FOR
MANSFIELD GENERAL HOSPITAL

BY
FIELDS, GRIFFITH & ASSOC., INC.

CERTIFIED PHYSICISTS AMERICAN BOARD OF RADIOLOGY AMERICAN BOARD OF HEALTH PHYSICS

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Tech- nique	Monitor	Peak Kilo- Volts	Primary Volt Meter With Load	Auto Trans- former	HVL IN MM	Milli- Amperes	Dis- tance	XXXXXX X FIELD	Roentgens Per Minute In Air				
					6-6					2-6	3-6	4-6	5-6
		COBALT - 60 Teletherapy					80	cm					
					99.6			4x4	105.2	104.1	102.9	101.8	100.7
					102.2			6x6	108.0	106.8	105.7	104.5	103.4
					103.9			6x8	109.7	108.5	107.3	106.2	105.0
					104.5			8x8	110.4	109.2	108.0	106.8	105.7
					105.4			8x10	111.3	110.1	108.9	107.7	106.5
					106.3			10x10	112.3	111.1	109.9	108.7	107.5
					106.8			10x15	112.8	111.6	110.4	109.2	108.0
					106.9			15x15	112.9	111.7	110.5	109.3	108.1
					108.3			20x20	114.4	113.2	111.9	110.7	109.5
					111.4			24x24	117.7	116.4	115.1	113.9	112.7
					65.4		100	16x6	69.1	68.3	67.6	66.9	66.1
					68.8			15x15	72.7	71.9	71.1	70.3	69.6
					69.3			20x20	73.2	72.4	71.6	70.8	70.1
					71.4			32x32	75.4	74.6	73.8	73.0	72.2

If used without plastic shelf, multiply above outputs by 1.07.
Source is 28.5cm from face of plastic shelf.

Warning lights - OK
Warning signs - posted
Wipe test - current
Distance indicator - OK
Field size indicator - OK
Beam verification film - OK
Room monitor - OK

New source installed 1-5-85

Charles R. Griffith

DATE 1-6-85

© 1975 T. FIELDS

CG/mg

MACHINE
MAKE
TYPE

TEM - Cobalt

1141 Hohlfelder Road
Glencoe, Illinois 60022

Phone: 835-4433 • Area Code 312

CONTROL NO. 78270

FIELDS, GRIFFITH & ASSOC., INC.

CERTIFIED PHYSICISTS
AMERICAN BOARD OF HEALTH PHYSICS
AMERICAN BOARD OF RADIOLOGY
1141 HONLFEIDER ROAD
GLENCOE, ILLINOIS 60022
AREA 312 635-4433

TELETHERAPY ROOM SURVEY Mansfield General Hospital

1-6-85

CONDITIONS

- A. Beam Vertical towards floor
- B. Beam 20° from vertical toward SW corner
- C. Beam 110° from vertical toward NE corner

POSITION (See Drawing)	Occupancy	FIELD SIZE (cm)	A CONDITION BEAM mR/hr*	B CONDITION BEAM mR/hr*	C CONDITION BEAM mR/hr*	
1. AB Control	C	1	20x20	S 0.5	S 0.5	S M
2. Door	C	1	20x20	S 1.5	S 2.0	S M
3. Window	C	1	20x20	S 0.5	S 1.2	S M
4. Floor	NA					
5. Wall BC	C	1/16	20x20	S M	S M	P 25
6. Wall CD	NC	1/4	20x20	S M	S M	P 3.3
7. Wall DE	C	1/4	20x20	S M	S M	S M
8. Wall EF	NC	1/4	20x20	S M	S M	S M
9. Ceiling	NC	1	20x20	S M	S M	S M

Survey Meter: Victoreen 440

Calibrated: 11-14-84

*The radiation values are the maximum obtained for the given condition.

C = Controlled

NC = Non-controlled

S = Scattered radiation

P = Primary radiation

M = minimal = 0.2mR/hr

SSD = 80cm.

NOTE: S = scattered radiation - Phantom in beam

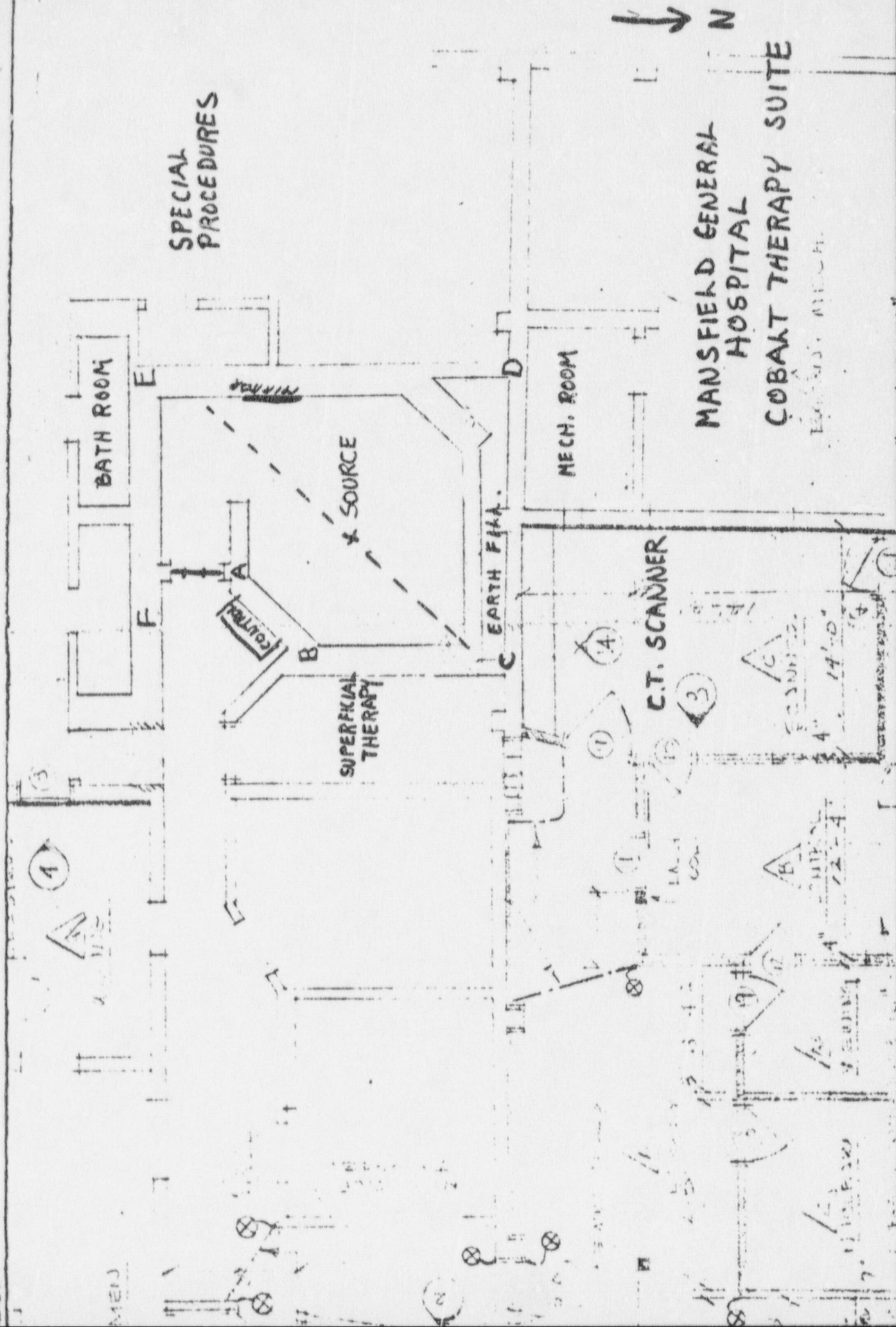
P = Primary radiation - no phantom in beam.

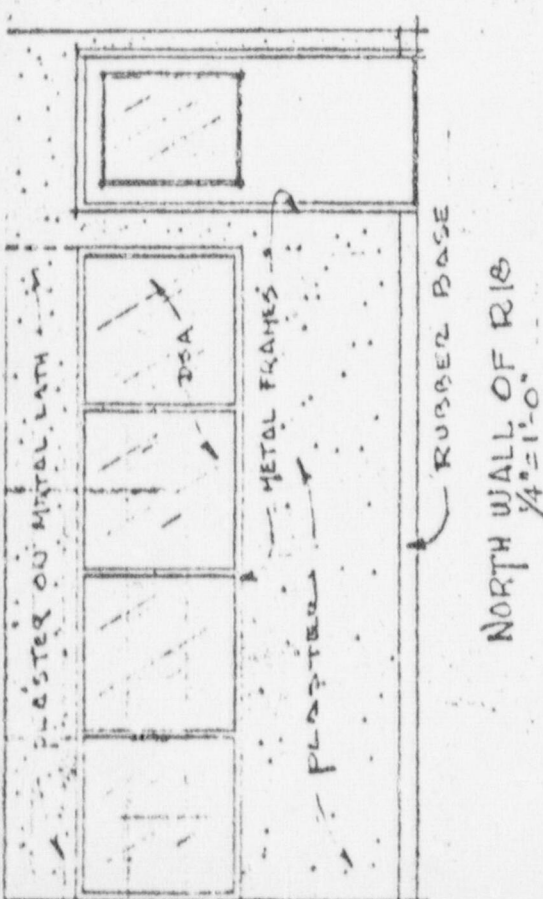
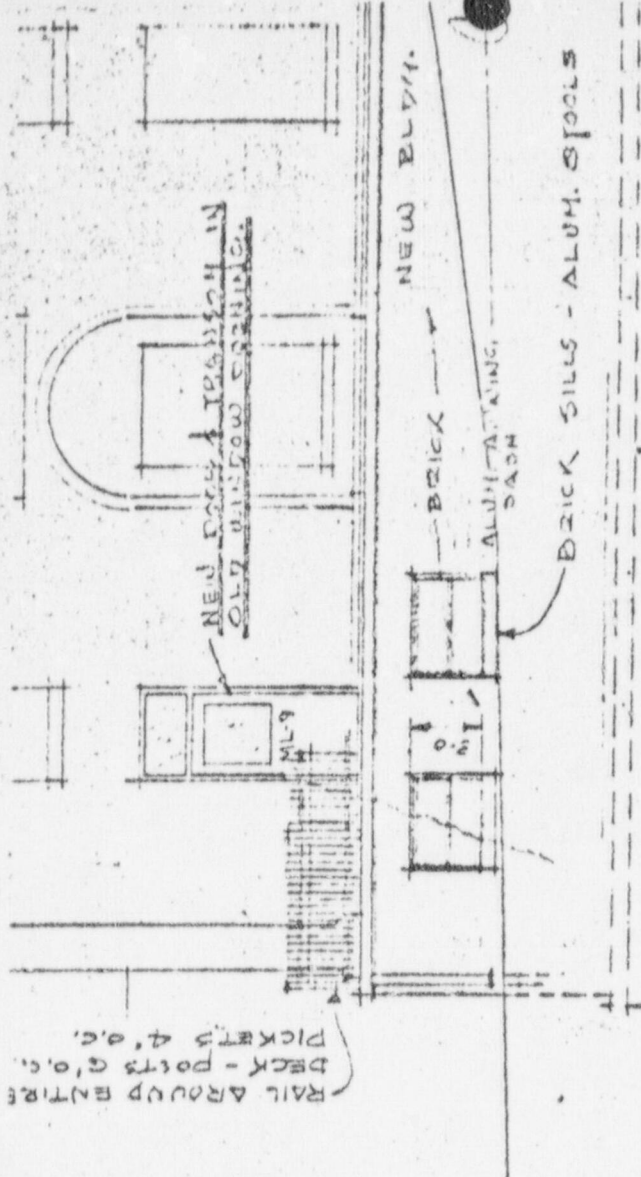
Phantom = water 12"x12"x12"

For position 5 and 6 above, the use factor for these positions is less than 10% and with cobalt "ON" time less than 50% during any one hour, it is assured that the hourly exposure level would be in keeping with Sec.20.105(b) of 10CFR 20.

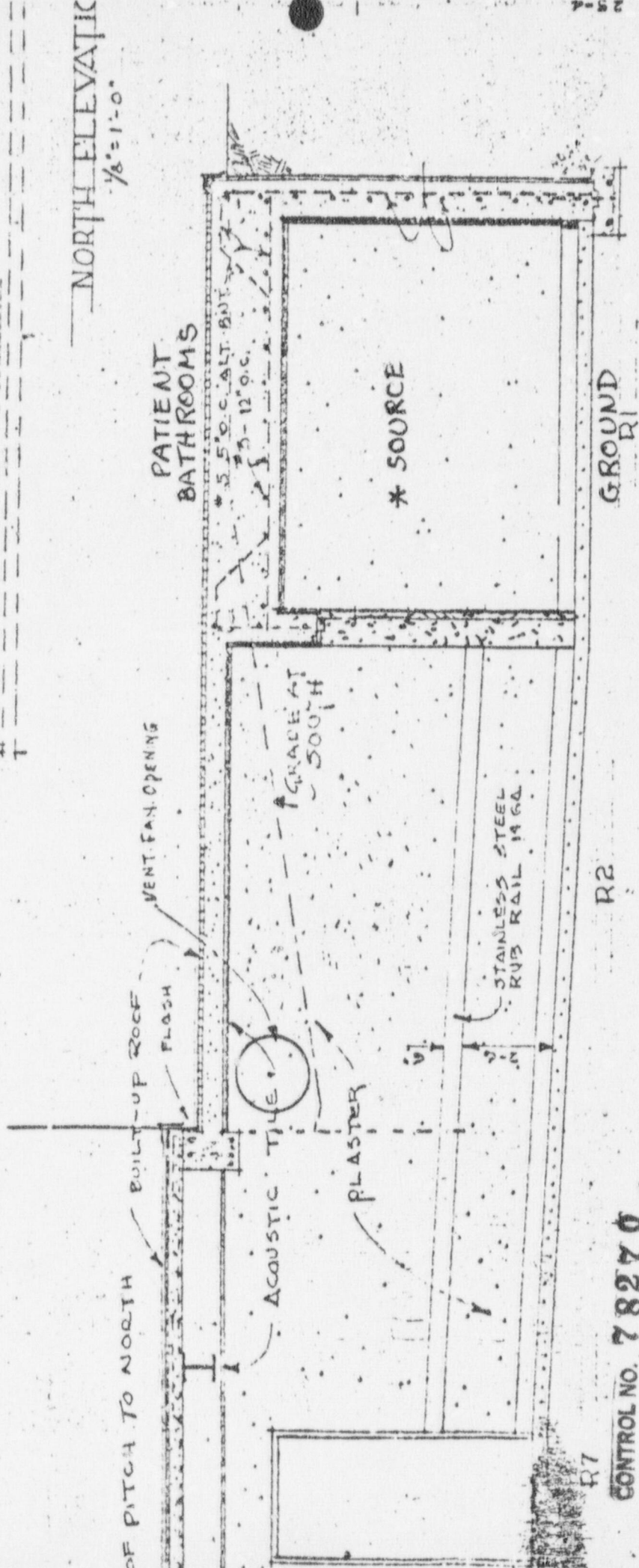
CONTROL NO. 78270

CONTROL NO. 78270





NORTH ELEVATION
1/8"=1'-0"



CONTROL NO. 78270

SECTION LOOKING SOUTH
1/4"=1'-0"

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CERTIFIED PHYSICISTS
AMERICAN BOARD OF HEALTH PHYSICS
AMERICAN BOARD OF RADIOLOGY
1141 HOHLFELDER ROAD
GLENCOE, ILLINOIS 60022
AREA 312 835-4433

PROTOCOL

TESTING DOOR INTERLOCK OF GAMMA BEAM TELETHERAPY UNITS

The test shall consist of the following steps:

- i) turn the teletherapy unit "ON"
- ii) open the door
- iii) ascertain whether the beam is on or off
- iv) close the door
- v) without touching the control panel determine whether the beam is on or off.

Units whose behaviour fully comply with the items below are designated "OK"

NCRP Report #33, item 4.2.4(d)8: "When the door to the treatment room is opened, the beam control mechanism shall automatically and rapidly return to the OFF position where it shall remain until the door is again closed and the machine is manually reactivated from the control panel."

ANSI N449-1974 "4.1.2 Facility Door Interlock. The electrical interlock on the entrance door to the teletherapy room shall cause the radiation beam control mechanism to automatically and rapidly returns to the "off" position. The machine control mechanism shall require manual reactivation from the control panel before resuming exposure."

ANSI N449.1-1978 "4.3 Door Interlock (see 4.1.2 in ANSI (1)). The test of the interlock shall be carried out by bringing the source to the "on" position, opening the door to break the interlock, and observing the sequence required to bring the source back to the "on" position. The interlock switch shall be adjusted such that any position other than the fully closed position of the door will break the circuitry and cause the source to return return to the safe condition. The machine control mechanism shall require manual reactivation from the control console before resuming exposure."

NRC Teletherapy Licenses, standard clause #17B "Each entrance to the teletherapy room shall be equipped with an electrical interlock system that will turn the teletherapy machine's primary beam of radiation off immediately upon opening of any entrance door. The interlock system shall be connected in such a manner that the teletherapy machine's primary beam of radiation cannot be turned on until all treatment room entrance doors are closed and the beam "on-off" control is reset at the control panel.

FIELDS, GRIFFITH, HUBBARD & ASSOC., INC.

CERTIFIED PHYSICISTS
AMERICAN BOARD OF HEALTH PHYSICS
AMERICAN BOARD OF RADIOLOGY
1141 HOHLFELDER ROAD
GLENCOE, ILLINOIS 60022
AREA 312 835-4433

PROTOCOL

TELETHERAPY TREATMENT TIMING DEVICE, SURVEY

Note: This does not include the "time correction term" evaluation (c.f. ANSI N449.1-1978, §4.14) which is properly part of every calibration and spot check.

The test shall consist of

- i) An accurate stop watch shall be used. Quartz wrist watches are suitable if they are known to have accuracy to 1 part in 100,000.
- ii) Set the treatment timer to a preset time of 1 minute
- iii) Observe that the treatment room is empty and the beam is pointing in a safe direction as evidenced by survey.
- iv) Activate the beam and at the same time activate the stop watch
- v) At the termination of the exposure stop the stop watch. Exposure termination is to be judged by the reduction of radiation levels caused by the exposure. Excessively slow, incomplete or other abnormal withdrawal of the source are to be noted and investigated.
- vi) Human error and source movement error combines to an accuracy of approximately ± 0.2 seconds at normal illumination levels. Thus, the set time and the measured time must agree within this amount.
- vii) Observe the teletherapy unit control, the teletherapy unit head, and the radiation monitoring device(s) to ascertain that the source is OFF.
- viii) Repeat steps "ii" to "vii" with a time set to 59 seconds to test the accuracy of the seconds timer.
- xi) Without resetting the timer, activate the timer while observing the levels of emitted radiation. Neither the source head indicator or the radiation level indicator should show a source advance.

Units whose behaviour fully complies with the items below when observed by an observer whose vision and mental abilities are normal or corrected to normal will be said to have a timer which is "OK" with respect to this survey.

→ NRC draft licensing guide "for comment" p 37 "(4) Teletherapy treatment timing device. The tests should be sufficient to ensure that the timer is accurate, that the source returns to the 'off' position at the end of the preset time, and that the source does not return to the 'on' position until the timer is reset."

FIELDS, GRIFFITH & ASSOC., INC.

CERTIFIED PHYSICISTS
AMERICAN BOARD OF HEALTH PHYSICS
AMERICAN BOARD OF RADIOLOGY
1141 HOHLFELDER ROAD
GLENCOE, ILLINOIS 60022
AREA 312 835-4433

PROTOCOL

TESTING OF "ON-OFF" INDICATORS OF GAMMA-BEAM TELETHERAPY UNITS

The test shall consist of the following steps:

- i) begin with the power off
- ii) turn on the power and activate unit (but not beam)
- iii) check all indicators on control, above door, on unit and monitor (if a monitor is available).
- iv) if all indicators indicate beam is "off" enter room with radiation detecting device (i.e. survey meter or chirpee). Note: the detecting device is not needed if an independent monitor is installed.
- v) determine whether the radiation levels are consistent with the beam being off.
- vi) exit room, close door
- vii) activate beam
- viii) repeat iii)
- ix) turn beam off
- x) repeat iii)

Units whose behaviour fully comply with the items below are designated "OK"

NCRP Report #33 item 4.2.1(d) 5 "There shall be on the housing and on the control panel a warning device that plainly indicates whether the beam is 'ON' or 'OFF'."

ANSI N449-1974 item 4.1.1 "Electrical and Mechanical Source Condition indicators should accurately reflect the 'on-off' condition or position of the radioactive source."

ANSI N449.1-1978 item 4.2 "Source-condition Indicator (see 4.1.1 in ANSI N449-1974 (1)). The operability of 'on' and 'off' position indicators at the control console and on the machine head and stand shall be confirmed visually. The patient viewing system (closed circuit television or mirror) should be used for treatment room source 'on' condition checks."

TELETHERAPY SOURCE TRANSFER

This is to certify that a cobalt-60 source:

Model Number: NPI-20-5000W
Serial Number: T-741
Containing 5060 curies as of 2/1/85

and which has been determined by helium pressure test and by wipe test to be leak free, has been installed in a teletherapy unit described as follows:

Manufacturer: TEM
Model Number: Stabilatron
Serial Number: 114

This source is hereby transferred from Neutron Products' Radioactive Materials License MD-31-025-03 to Mansfield General Hospital's Radioactive Materials License

This will also certify that a cobalt-60 source described as follows:

Model Number: NPI-20-5000W
Serial Number: T-425
Containing 2718 curies as of 2/1/85

has been determined by a wipe test to be leak free and has been removed from the above teletherapy unit and transferred from

Mansfield General Hospital's Radioactive Materials License to Neutron Products' License MD-31-025-03.

We have witnessed the inspection and operation of the above teletherapy unit after completion of the installation by Neutron Products, Inc. and have found the unit to be operating properly and safely.

Charles R. Smith

Date 1-6-85

LB Brown
Neutron Products, Inc.

Date 1-6-85

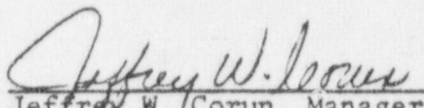
TELETHERAPY SOURCE CERTIFICATION

This certifies that the cobalt-60 source:

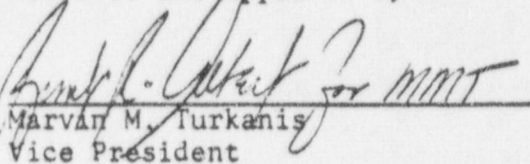
Model Number NPI-20-5000W
Serial Number: T-741
Containing 5060 curies as of 2/1/85

was fabricated by Neutron Products, Inc. in accordance with NPI specification P-4 per Drawing Number A20005 and was leak tested by the helium pressure test and found to be leak free on 1-3-85. The source was wipe tested and the removable activity was .010 and .0006 microcuries from the inner and outer encapsulations, respectively.

Performed by and certified to by:


Jeffrey W. Corun, Manager
Hot Cell Operations

Reviewed and approved by:


Marvin M. Turkanis
Vice President

Date 1-3-85

NEUTRON PRODUCTS inc

CONTROL NO. 78270

REPORT OF INSPECTION AND SERVICING
("FIVE YEAR INSPECTION" REPORT)

This is to certify that the TEM
teletherapy unit, Model Stabilatron, Serial Number 114
located at Mansfield General Hospital, 335 Glessner Avenue,
Mansfield, Ohio 44903 was inspected and serviced on
1-5-85 by Russ Brown to assure
the proper function of the source exposure mechanism as authorized
by Maryland License MD-31-025-03.

Signed R Brown Date 8-6-85

Parts: Shutter / core Assy. (Existing one found
& be corroding)

Nonstandard Service: All components contaminated by
corroding shutter cleaned & it
monitored

Facility Address:

Revision Date
July 25, 1983

Mansfield General Hospital
335 Glessner Avenue
Mansfield, Ohio 44903

INSPECTION CHECK LIST

Unit: TEM Stabilatron Serial Number: 114

Operation	Prior to Transfer*	Subsequent to Transfer**
-----------	--------------------	--------------------------

- | | | |
|---|------------------|----|
| 1. Determine Operating History | X✓ | |
| 2. Head Movement | X✓ | X✓ |
| 3. Electrical and Mechanical Source Condition-Indicator Check | X✓ | X✓ |
| 4. Manual Source/Shutter Return | X✓ | X✓ |
| 5. Timer | X✓ | X✓ |
| 6. Source Holder/Shutter Movement Check | X (See 5/1 12SP) | X✓ |
| 7. Pneumatic Activating System | X N/A | X |
| 8. Mercury Shutter System | X N/A | X |
| 9. Stand and Stretcher | | X✓ |
| 10. Protective Source Housing, Beam-Off Leakage (Confirm Measured by Medical Physicist) | | X✓ |
| 11. Source-Surface Distance (SSD) | | X✓ |
| 12. Beam Orientation | X✓ | X✓ |
| 13. Congruence of Light and Radiation Fields | | X✓ |
| 14. Full Calibration (Confirm Performed by Medical Physicist) | | X✓ |
| 15. Facility Door Interlock | X✓ | X✓ |
| 16. Teletherapy Units with Moving Source Drawer | X N/A | X |
| 17. Teletherapy Units with Moving Shutter Blocks | X N/A | X |
| 18. Teletherapy Units with Rotating Shutter | X✓ | X✓ |
| 19. Indicator Light | X✓ | X✓ |
| 20. Emergency Shutoffs | X✓ | X✓ |
| 21. Collimator | X✓ | X |

Note: *Circle all items not meeting attached criteria.

**Circle all items not meeting attached criteria after servicing.

Signed: W. B. Baker

Date: 6.1.85

CONTROL NO. 78270

NEUTRON PRODUCTS Inc

FGH

Certified
Radiation
Physicists

Fields, Griffith, Hubbard
and Associates, Inc.

1141 Hohleider Road
Glenview, Illinois 60022
312 835-4433

Western Regional Office
2483 Whippoorwill
Las Vegas, NE 89121
702 731-6446

Theodore Fields M.S. F.A.C.R. C.H.P.
Charles R. Griffith M.S. F.A.C.R.
Lincoln B. Hubbard Ph.D. M.A.C.R. C.H.P.
Michael V. Broadbent Ph.D. M.A.C.R.
Francis E. Gannon M.S.

April 10, 1985

William J. Adam, Ph.D
Materials Licensing Section
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

RE: Control Number 78270

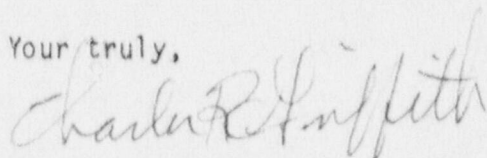
Dear Dr. Adam:

In reply to your letter and as a follow-up to our phone conversation of last week, please consider the following.

Referring to the survey report submitted on January 6, 1985, the measured radiation level in the superficial therapy room was 25 mr/hr when the beam was horizontal and aimed at the NE corner. In our original plan this position was anticipated. However, in checking the therapy records the greatest angle from the vertical towards the NE corner that has been used is less than 5°. But assuming that this horizontal beam toward the NE corner is used on one patient per year, the treatment time would be about 4 min, which would result in an exposure of 1.67 mR at position 5. This would only occur one time per day during the series of treatments. The superficial therapy unit is used very seldom and the occupancy of this room is extremely limited. The one therapy technologist treats only one patient at a time and if using the superficial room would not be treating in the cobalt room.

I feel it is evident that the sections 20.105 (b) (1) & (2) or 10 CFR Part 20 are met and I hope that this is satisfactory to complete your review of our new source survey.

Your truly,



Charles R. Griffith, M.S., F.A.C.R.

cc: Joel E. Kaye, M.D.
Radiology Department
Mansfield General Hospital
Mansfield, Ohio 44903

RECEIVED
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34-02007-02 PDR

APR 15 1985