

APR 02 1987

License No. 37-09995-02  
Docket No. 030-00488  
Control No. 106650

Nazareth Hospital  
ATTN: Sister M. Therese, Admin.  
2601 Holme Avenue  
Philadelphia, Pennsylvania 19152

Gentlemen:

Please find enclosed an amendment to your NRC Material License.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the Region I Material Licensing Section, (215) 337-5239, so that we can provide appropriate corrections and answers.

Please be advised that you must conduct your program involving licensed radioactive materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, please note the items in the enclosed, "Requirements for Materials Licensees."

With the receipt of your letter dated December 25, 1986 and the Radiation Safety Survey dated March 21, 1987, Condition 16. of License No. 37-09995-02 has been fulfilled.

Since serious consequences to employees and the public can result from failure to comply with NRC requirements, the NRC expects licensees to pay meticulous attention to detail and to achieve the high standard of compliance which the NRC expects of its licensees.

You will be periodically inspected by NRC. A fee may be charged for inspections in accordance with 10 CFR Part 170. Failure to conduct your program safely and in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in prompt and vigorous enforcement action against you. This could include issuance of a notice of violation, or in case of serious violations, an imposition of a civil penalty or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C.

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Nazareth Hospital

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We wish you success in operating a safe and effective licensed program.

Sincerely,

**Original Signed By:**  
**Jack Davis**

Jack Davis  
Nuclear Materials Safety Section B  
Division of Radiation Safety  
and Safeguards

Enclosures:

1. Amendment No. 14
2. Requirements for Materials Licensees

DRSS:RI  
Davis/k1

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MS-16  
K2

Memorandum:

To: Sister M. Therese, Administrator  
From: Robert Stanton, Ph.D., D.A.B.R. *R. Stanton*  
Date: March 21, 1987  
Re: New Cobalt-60 Source, Radiation Safety Survey

In response to the letter of Jack Davis, Nuclear Materials Safety Section B., Division of Radiation Safety and Safeguards, Nuclear Regulatory Commission dated March 12, 1987, I have enclosed a report of radiation safety measurements made today.

The enclosed report conforms to condition 16 of license # 37- 09995 -C2, and in addition to points 1 and 2 of Mr. Davis's Letter. Please call me if there are any questions regarding this information at 609-342-2307.

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# Report on Radiation Safety Survey

## Nazareth Theratron 80 Co-60 Unit

Date of Measurements: February 26, 1987

Equipment: Keithley Cutie-Pie Type Meter, Model 36155  
Serial Number 23340  
(Calibrated 10/15/86, using Cs-137 Source traceable to the NBS)

Indicators/Interlocks:

Interlocks: Door switch, emergency bars, timer and key all force the source off.

All indicators are functioning including red light above door, rod indicator on machine head, lights on console, and independent radiation monitor.

Note: all indicators and interlocks are functioning properly.

Exposure Conditions:

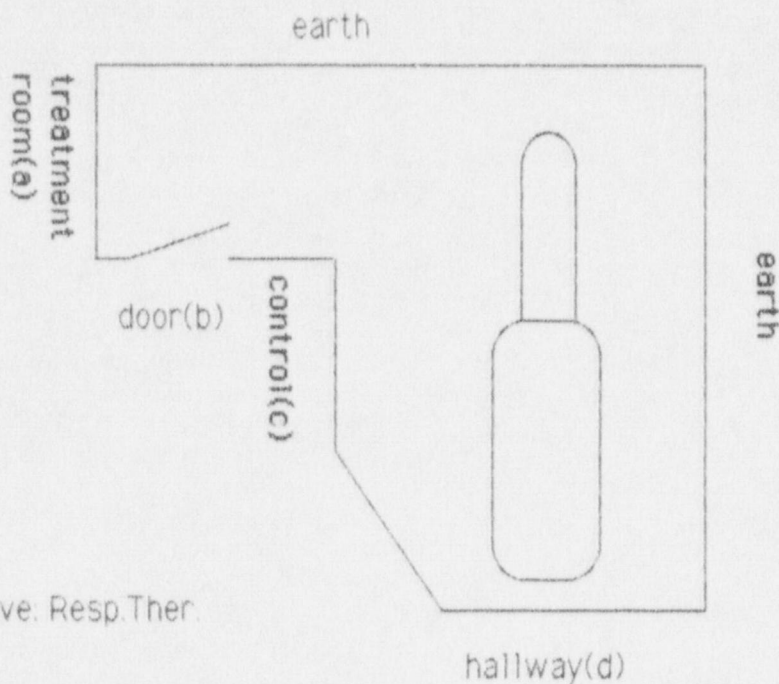
A: Beam aimed at Barrier, no scatter. For primary barriers, this is the maximum intensity radiation condition. Maximum radiation measurements were determined which were approximately 30 degrees off alignment with the beam's central ray. It is this value which is reported.

B: Beam aimed at Barrier, with scatter. For secondary barriers, this was the maximum intensity radiation condition. The phantom used was a cellulose phantom (dense paper), measuring two feet by 1 foot by 1 foot and fully intercepting the radiation field.

C: Beam aimed Down, with scatter

Beam Size: Maximum: 30x30 cm at 80 cm SAD

Diagram:



Above: Resp. Ther.  
(e)

Measurements:	condition A	condition B	condition C
position		Output(mR/hr)	
a	-	25	0.1
b	-	47	0.8
c	0.9	-	0.2
d	-	-	<0.1
e	0.3	0.4	-

Areas indicated "earth" are not occupiable.

All measurements indicated are the maximum readings in the indicated area.

## Interpretation:

Assumptions: For weekly levels:  
 Workload: 50 patients/day  
 3 minutes/patient  
 5 days/week  
 750 minutes = 12.5 hours/week  
 For "in one hour" restriction:  
 Workload: 8 patients per hour  
 24 minutes/hour

Use Factors: 0.25 walls (primary)  
 0.5 ceiling (primary)

Calculations of Dose Equivalent values for Occupied Areas adjacent to Co-60 Teletherapy Room:

- a.  $2.5 \text{ mR/hr} \times 24/60 = 1 \text{ mRem in one hour}$   
 $2.5 \text{ mR/hr} \times 12.5 \text{ hr} = 31 \text{ mRem in one week}$
- b.  $4.7 \text{ mR/hr} \times 24/60 \text{ hr} = 1.9 \text{ mRem in one hour}$   
 $4.7 \text{ mR/hr} \times 12.5 \text{ hr} = 58.8 \text{ mRem in one week}$
- c.  $< 1 \text{ mRem in one hour}$   
 $< 13 \text{ mRem in one week}$
- d.  $< 0.1 \text{ mRem one hour}$   
 $< 1.5 \text{ mRem in one week}$
- e.  $0.4 \text{ mR/hr} \times 24/60 < 0.2 \text{ mRem in one hour}$   
 $< 8 \text{ mRem in one week}$

Note: All levels were calculated assuming use factors such that the maximum reading obtained is always obtained and occupancy factor values of 1. Using these assumptions, all levels in the department (areas a,b,c,and d) are well under the unrestricted limit of 2 mRem in any one hour and 100 mRem/week. All levels outside the department are even lower than these.

signed: Robert Stanton, Ph.D.  
 D.A.B.R.