

# Research Medical Center



2316 East Meyer Boulevard  
Kansas City, Missouri 64132  
816/276-4000

July 3, 1985

William J. Adam Ph. D.  
Material Licensing Section  
United States Nuclear Regulatory Commission  
Region 3  
799 Roosevelt Road  
Glen Ellyn IL 60137

RE: LICENSE # 24-17998-01  
CONTROL # 78425

Dear Dr. Adam:

Enclosed, please find the additional information you requested concerning the high intensity sources applicable to our cobalt 60 license amendment.

For the sake of expediency if you can address all correspondence to myself at the following address:

Research Medical Center  
Department of Radiation Oncology  
2316 E Meyer Blvd.  
KC MO 64132

Sincerely,

Walter J. Kopecky, Ph.D.  
Medical Physicist  
Director, Department of Radiation Oncology

WJK/lcj

Enc:

RECEIVED  
JUL 08 1985  
REGION III

### Head Leakage With Source in "OFF Position

The head leakage readings were obtained from documentation submitted to the Nuclear Regulatory Commission on or about June 18, 1980 and are included in the exhibit labeled Enclosure #2 of the same license amendment.

<u>View</u>	<u>4660 Ci</u>	<u>7000 Ci</u>
1	0.4	.53
2	1.4	1.86
3	0.8	1.06
4	0.4	0.53
5	1.2	1.60
6	2.2	2.93
7	0.4	0.53
8	0.4	0.53
9	0.6	0.80
10	0.6	0.80
11	0.8	1.06
12	0.8	1.06
13	2.4	3.19
14	<u>1.6</u>	<u>2.13</u>
Average Value:	1.0	1.33
Maximum Value:	2.4	3.19

From documentation submitted to the Nuclear Regulatory Commission on or about June 18, 1980, and included in the exhibit labeled Enclosure #3 of the same license ammendment.

	Measuring points (mR/hr.)					
<u>Strength</u>	1	2	3	4	5	6
4660 Ci	3.3	5.0	0.3	0.5	14	0.9
7000 Ci	4.4	6.7	.4	.7	18.6	1.2

For the proposed 7000 Ci (maximum) source

assume: 1.0 min./port  
2 ports/patient  
40 patients/day  
5 days/week

This results in a total beam "ON" time of 1.3 hr./day or 6.7 hrs./weeks

Anticipated maximum exposures from Table I.

Points	Weekly (mR)
1	28.50
2	43.50
3	2.5
4	4.5
5	121.0
6	8.0

Item 9.d. Beam stop

Electrical interlocks prevent the source from being turned "ON" when the source head is pointing in an improper direction.

Using the angle orientation convention of  $0^\circ$  is vertical toward the floor;  $+90^\circ$  is horizontal toward the outside wall;  $180^\circ$  is vertical toward the ceiling; and  $-90^\circ$  is horizontal toward the console wall, the interlocks are set at  $-10^\circ$  and  $+110^\circ$ . These interlocks prevent the source from being turned "ON" when the source head is pointing in the direction of an arc circumscribing the console wall thru the ceiling and part of the outside wall.

A more detailed description can be found in license amendments and documentation submitted over the past several years

Item 9.e. Shielding evaluation

In accordance with license amendment approved in 1984 the area adjacent to the outside (west) wall and the air shaft are restricted areas. A detailed description of the safety procedures dealing with this area are described in the formentioned amendment.

E.N.C.L. # 2

21

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

Top View - Showing orientation  
of Views A through D

Radiation  
Level  
(mS/hr)

Position No.

View A 1 0.4  
2 1.4  
3 0.8  
4 0.4

View B 5 1.2  
6 2.2  
7 0.4  
8 0.4

View C 9 0.6  
10 0.6

View D 11 0.8  
12 0.8  
13 2.4  
14 1.6

Average value 1.0

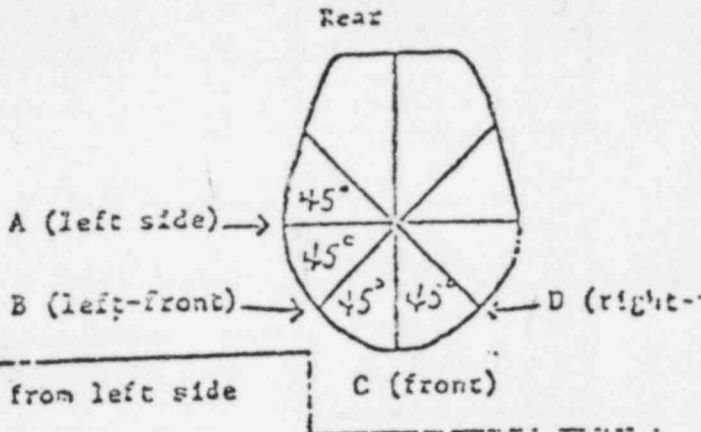
Maximum value 2.4

Instrument used LUDLUM Mod 5  
CALIBRATED 3-15-80

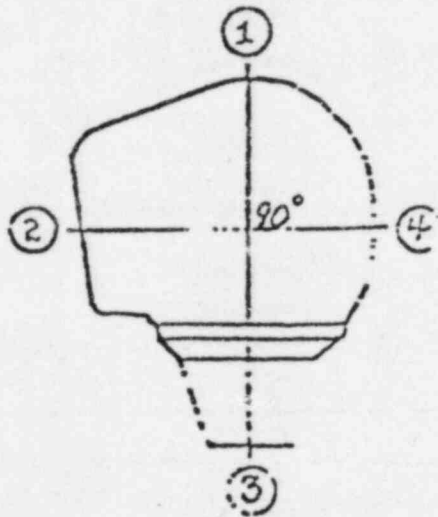
R/M 5118  
Curies 4660  
Date May 1, 1970

Manufacturer's  
name & model #  
of teletherapy  
unit AECL

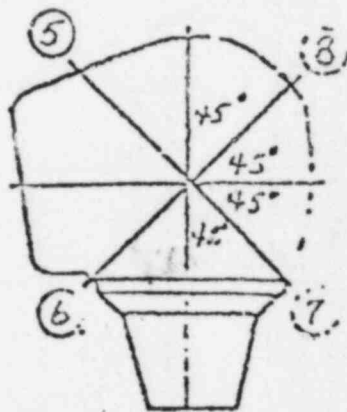
EL DORADO 8



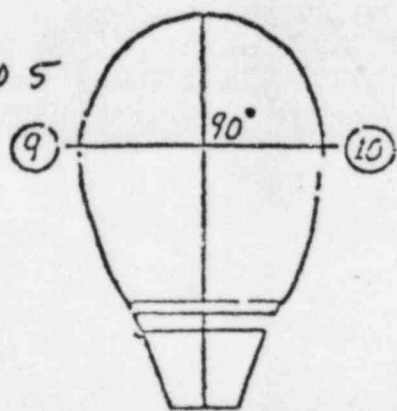
View A - Vertical from left side



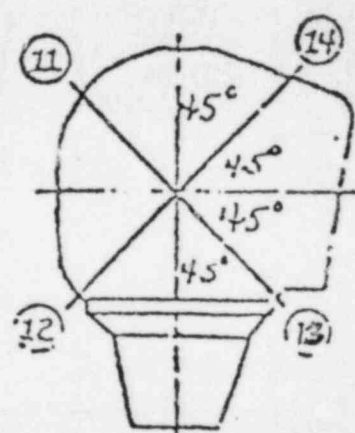
View B - Vertical from left-front



View C - Vertical from front



View D - Vertical from right-front



Enc #3

VIEW #1

North

MAXIMUM READINGS AT MOST ADVERSE BEAM ORIENTATIONS  
PERMITTED:

Mr/hr at points  
numbered:

- 1. - 3.3
- 2. - 5.0
- 3. - 0.3
- 4. - 0.5
- 5. - 14
- 6. - 0.9
- 7. - NO DETECTABLE  
RADIATION

West

5

East

Cobalt  
Control  
Panel

Unoccupied Air  
Shaft with 3"  
Concrete walls

North, West, and East walls  
have 12" concrete. South wall  
has 18" concrete.

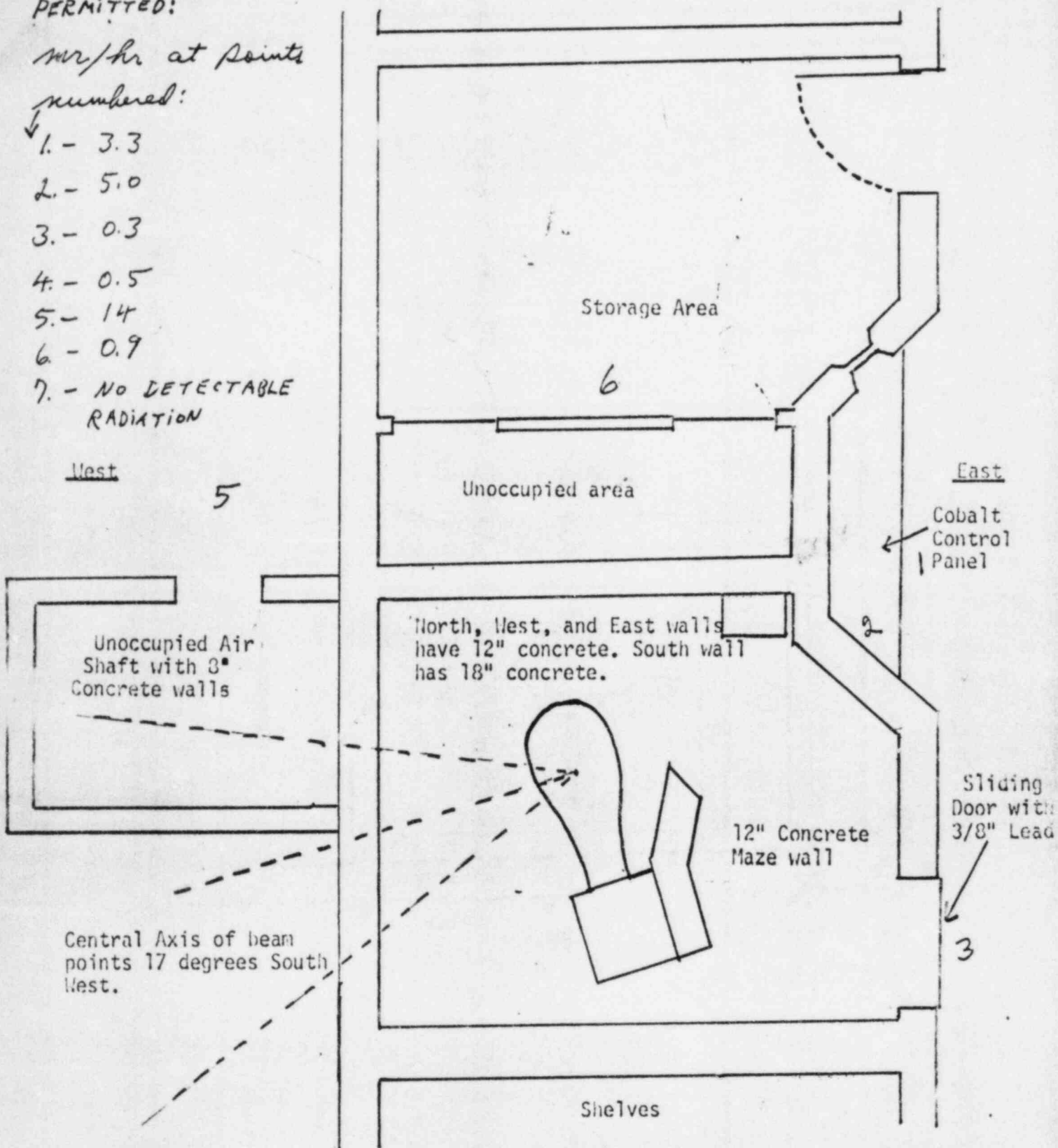
12" Concrete  
Maze wall

Sliding  
Door with  
3/8" Lead

Central Axis of beam  
points 17 degrees South  
West.

Shelves

South



# CONVERSATION RECORD

TIME

3:00P

DATE

new dt: 7/4/85  
6/4/85

TYPE

☐ VISIT

☐ CONFERENCE

☒ TELEPHONE

☒ INCOMING

☐ OUTGOING

ROUTING

NAME/SYMBOL INT

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

ORGANIZATION (Office, dept., bureau, etc.)

TELEPHONE NO.

W. Kopecky, Ph.D.

SUBJECT

C/N 78425

SUMMARY

Requested 30 day extension on response -

ACTION REQUIRED

MS 16

entered on 6/3/85

MS 15

"

"

6/4/85

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

W. J. Adams

DATE

6/4/85

ACTION TAKEN

SIGNATURE

TITLE

DATE