PHYSICIANS RADIOLOGY, INC.
ST. LOUIS HILLS RADIOLOGY
6651 CHIPPEWA ST. LOUIS, MISSOURI 63109
PHONE: 647-8893

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RECEIVED

PRACTICE LIMITED TO X-RAY DIAGNOSIS AND RADIATION THERAPY

- RADIOLOGISTS -
SAM J. MERENDA, M.D.
M. AL-ALY, M.D.
H. C. SHEN, M.D.
U. K. HWANG, M.D.

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U.S. NUCLEAR REG. COMMISSION
NMSS RIDS SECTION

January 5, 1981

Francis A. St. Mary
Material Licensing Branch
Division of Fuel Cycle and
Material Safety
United States
Nuclear Regulatory Commission
Washington, D.C. 20555

Reference Control No. 04930

Dear Mr. St. Mary:

In answer to your letter dated Dec. 8, 1980, requesting additional information regarding the radiation survey of our Cobalt-60 source unit, I submit the following:

1. The new Cobalt-60 source installed is an Advanced Medical Systems, Inc., Model AMS 3801 source.

2. Our teletherapy unit is a Picker Corporation Model 6150 A.

3. With respect to question #3, please refer to enclosures #1 (Survey of Fred C. Abrath, Ph.D, physicist from Mallinckrodt Institute of Radiology, Division of Oncology) and enclosure #2 (Survey of Palmer G. Steward, Ph.D. Medical physicist, 7375 Shaftesbury, St. Louis, MO. 63130).

4. In regard to Inquiry #4, we were aware of the Condition #23 added to our license and we did so inform the manufacturer and physicist of this condition prior to and at the time of installation. The manufacturer (Advanced Medical Systems, Inc.) stated that they did not anticipate any problem, since this source had been installed in 1965 and 1970 and measurements, at that time, showed the output to be within the accepted range. They elected to install the new source.

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When Mr. Fred Abrath (physicist) made a radiation survey after the installation of the new source, and showed an average leakage of 2.08 mR/hr, we notified (sent a copy of the survey) to Mr. R. J. Skrtich of the Advanced Medical Systems, Inc., 1020 London Road, Cleveland, Ohio 44110. A report was also sent to you (August 19, 1980). It was the expressed feeling of both the physicist and the Advanced Medical Systems, Inc. installer that the output was so near the accepted 2.0 mR/hr, that it would be acceptable. The survey pointed out that there were no hot spots.

About 15 - 16 treatments are given per day, 5 days a week. All patients are set up by one of two radiologists--not by technicians or other personnel. One radiologist (myself) treat on Mondays and Thursdays; the other treats on Wednesdays and Fridays. On Tuesdays, each of us treats some of the patients. All of the patients are treated on an out-patient basis in this private office, so that none of the set-ups are complicated and they take only a short period of time, so that no personnel is in the proximity of the Cobalt head for any length of time.

Upon receipt of your letter dated December 8, 1980, we contacted the physicist (Fred Abrath of Mallinckrodt) and presented him with the letter instructing him to make appropriate surveys to comply with the contents of your letter. We also contacted an independent physicist (Palmer G. Steward, Ph.D.) asking that he make an independent survey about the Picker Unit Head. A copy of this survey is enclosed (see enclosure #2). The measurements are still over the 2.0 mR/hr.

If this attached independent survey from the second physicist (P. G. Steward) still does not allow you to approve the source, then I would request a waiver for the following reasons:

a. Installation of a new source would cause disruption in the treatment course of my patients and could have a deleterious effect on the outcome of their illness. Some are in the early weeks of treatment, some near the end and many in the middle. We have no other (no second source) for treating them,

b. As pointed out above, two radiologists do all of the treatments so that no one gets much exposure to the Cobalt head.

c. The installation of a new source would necessitate additional exposure to the installing personnel of Advanced Medical Systems, Inc.

Following receipt of your letter dated December 8, 1980, I immediately contacted the physicists and the manufacturer. We pushed everybody to move as fast as we could, but with the holidays, etc., it took this long for me to get the information you requested. Enclosure #1 by physicist Fred Abrath answers questions 5, 6, 7 and 8.

If this waiver is not granted, then I will immediately notify the manufacturer to have the source changed as quickly as possible, since I do want to comply with the requirements of your office.

It is my hope that you will be able to honor my request for a waiver. I thank you for any help you can give me in this delicate matter.

Sincerely,

S. J. Merenda, M.D., F.A.C.R.
Radiologist

SJM:lnl

enclosures #1, #2.

ENCLOSURE #1

WASHINGTON UNIVERSITY

SCHOOL OF MEDICINE

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THE EDWARD MALLINCKRODT
INSTITUTE OF RADIOLOGY
DIVISION OF RADIATION ONCOLOGY

Addressing #5 of the letter in regards to the functioning of the beam stop the following was found.

a) With the primary beam directed toward the integral beam absorber there are no operational stops either mechanically or electrically. Therefore an angle of 360 degrees allowed.

b) With the primary beam directed away from the integral beam absorber a beam stop exists at an angle of 55 degrees clockwise from vertical down and at an angle of 25 degrees counterclockwise from vertical down.

c) The tests to show the above operation consisted of the following: the teletherapy unit was rotated to a certain angle, then the machine was turned on and it was noted whether the beam actually came by two methods; one, whether the light indicator came, two with a T.V. camera focused on a survey meter lift inside the teletherapy room, a television monitor external to the room would show any deflection on the exposure meter indicating whether the beam is on or off.

Addressing number 7 in the letter, the method used above with the exposure meter and T.V. Camera inside the cobalt room was employed to check the ON-OFF operation of the teletherapy unit. This same method was employed to check the proper functioning of the timer.

Addressing number 8 of the letter the green light was replaced as mentioned in 3.2.5. Item number 3.1.1 was found not to pertain to this teletherapy unit and was mistakenly included in the report.

Fred Abrath Ph.D.

510 SOUTH KINGSHIGHWAY ST. LOUIS, MISSOURI 63110

ENCLOSURE #1

WASHINGTON UNIVERSITY

Addressing number 6 in the letter the following is the information regarding the area survey.

Area Survey:

The area around the treatment room was surveyed in accordance with Item V of the Teletherapy Licensing Guide (1975). The readings were taken with the surface of a phantom 60cm from the source. Measurements were made with the beam at 180° vertical down and at 90° counterclockwise from vertical down. The values reported were the maximum levels found using the survey meter. All Measurements were made 1 foot from wall service.

LOCATION	Max Reading
Console	0.2 mR/hr
South Wall (orthovoltage Room)	0.5 mR/hr
Door of Cobalt Room	0.2 mR/hr
Ceiling	0.1 mR/hr
North Outside Wall	0.1 mR/hr

The room survey was performed with a Panoramic Victoreen Model 470A, Serial 918, calibrated 8/29/80 @ Washington University against 137 Cs calibrator/ usn375, S.N. F163, under NRC License 24-00167-11.

Fred Abraham PhD

ENCLOSURE #2

Palmer G. Steward, Ph. D.
Medical Physicist
7375 Shaftesbury
St. Louis, Mo 63130
January 2, 1980

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Sam J. Merenda, M.D.
Physician's Radiology
6651 Chippewa Ave.
St. Louis, Mo 63109

On December [illegible] 1980 the radiation field was surveyed surrounding the head of the Picker cobalt-60 unit, Style 3347B, S/N 105, located at the office of Dr. Merenda, Physician's Radiology, 6651 Chippewa Ave., St. Louis, Mo.

With the source in the off position and the collimators open, the exposure rate was determined at fourteen points on the surface of a sphere of radius 1 meter centered at the cobalt source. The fourteen points were those suggested by the American National Standards Institute (ANSI N449. 1 1978) and found acceptable by the Nuclear Regulatory Commission. The points on the sphere are identified by: one at each pole, 4 in the equatorial plane, and one at the center of each of the eight spherical triangles formed by connecting these 6 points.

The survey instrument used was a Victoreen model 440, serial number 3186 calibrated on December 22, 1980 using a cobalt-60 calibration source. This calibration source was compared with a reference standard in April, 1980, which in turn was calibrated relative to an NBS standard. The accuracy of the calibration standard is believed to be approximately ±3 percent.

The results of the survey are as follows: The minimum and maximum exposure rates were 0.3 mR/h and 3.9 mR/h, respectively. Assuming an overall accuracy of ±10% for the survey, the average exposure rate of all fourteen points lies within the interval 1.9 to 2.4 mR/h.

Palmer G. Steward

Palmer G. Steward, Ph.D.
Medical Physicist