DEC 8 1980

FCMLB:FAS
030-00318
(04930)

Sam J. Merenda, M.D.
Physicians Radiology, Inc.
St. Louis Hills Radiology
6651 Chippewa
St. Louis, MO 63109

Dear Dr. Merenda:

This is in reference to a report dated August 19, 1980, signed by Stuart E. Bundy, R.T., describing the results of a radiation survey of your cobalt-60 teletherapy unit. In order to complete our evaluation of the report, we need the following additional information.

1. We assume the new cobalt-60 source installed in your teletherapy unit is an Advanced Medical Systems, Inc., Model AMS 3801 source. If our assumption is not correct, please specify the manufacturer's name and model number of your new source.

2. Item 3 of the report states that your teletherapy unit is a Model 6150. Your license authorizes a Picker Corporation Model 6150A. Please confirm the proper model number of your unit.

3. The report indicates that a Victoreen Model 444 instrument was used to make the measurements reported in the survey. We note that this instrument was last calibrated approximately two years and ten months before the survey.

   a. Please describe the standards (i.e., radionuclide, activity) and procedures used to calibrate this instrument.

   b. If this instrument was last calibrated in October 1977, please submit new head leakage measurements and a new survey of radiation levels in areas surrounding the teletherapy treatment room using a survey instrument that has been properly calibrated within the past year (see Items 4 below).

4. The report shows an average head leakage of 2.08 mR/hr at one meter from the source. This value exceeds the limit of 2 mR/hr authorized in Condition 18.A.(i) of your license. In our letter dated May 20, 1980, we

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advised you of our concern that a new source might exceed the limit and we stated that we had added Condition 23, to your license. Condition 23 requires you to return the new source to the manufacturer if the limits authorized by Condition 18.A.(i) are exceeded. Please advise us of the actions you plan to take to comply with the terms of your license.

5. We need clarification of the beam stops that restrict beam orientation. Item 9 of the survey report states that the interlocks "do not allow the radiation to be turned on past 20° counterclockwise from the vertical down position or past 40° clockwise from the vertical down position." Item 11 of the survey report states that measurements were made with the primary beam at 90° counterclockwise from vertical down. In Item 3.2.3 of the dosimetry report, it is stated that "Interlocks and head angulation do not allow the radiation beam to be turned on unless the head is angled between the angles of 70° and 220°." Your renewal request dated March 26, 1979, specified the beam is limited to 20° counterclockwise and 60° clockwise with respect to vertical down. In view of these conflicting statements, please:

   a. Specify the mechanical and/or electrical beam stops that are operational and restrict beam orientation when the primary beam is directed toward the integral beam absorber. Specify each direction in which the teletherapy head can be moved and the maximum angle (from vertical) of the beam orientation in each direction. (See Section III.B.3 of the guide.)

   b. Specify the mechanical and/or electrical beam stops that are operational and restrict beam orientation when the primary beam is directed away from the integral beam absorber. Specify each direction in which the teletherapy head can be moved and the maximum angle (from vertical) of beam orientation in each direction. (See Section III.B.3 of the guide.)

   c. Please describe the tests that were conducted to ensure proper operation of electrical or mechanical stops installed for the purpose of limiting use of the primary beam of radiation. Your tests must be sufficient to show that the stops limit use of the primary beam in the manner described in a. and b. above.

6. From your report of radiation levels in the surrounding areas, it is not clear that radiation levels were measured both with and without the integral beam absorber intercepting the primary beam of radiation. It also appears that reported radiation levels are not correlated with the orientation producing these values. Please provide the following information:

a. For those orientations when the primary beam of radiation is directed toward the integral beam absorber, determine the rotational position of the teletherapy unit that causes the maximum radiation level in each area adjacent to the teletherapy facility (including above the facility). Report the maximum levels measured with the phantom in the primary beam and specify the corresponding rotational position (i.e., angulation toward each area). In general, the maximum levels will be encountered with the beam oriented 30° from the perpendicular toward the barrier in question.

b. For those orientations where the primary beam is directed away from the integral beam absorber, report maximum radiation levels that are measured in each area adjacent to your teletherapy facility, including above. You should be sure that the measurements are made with the beam in its most adverse orientation with respect to each barrier.

c. Your report should clearly indicate how you will comply with our regulations and the terms of your license. The enclosed Discussion of Restricted and Unrestricted Areas for Teletherapy Licensees may be of assistance to you by explaining our requirements for these areas.

7. Although you indicate that certain safety systems operate properly, you have not described the tests that were conducted to ensure their proper operation. Please describe the tests that were conducted to ensure proper operation of:

a. Teletherapy source "on-off" indicators, electrical and mechanical, both at the source housing and at the teletherapy machine control panel. You should use a method of cross-checking these indicators, such as using a radiation detection instrument, to ensure that the indicators correspond to the actual condition of the source.

b. Teletherapy treatment timing device. In addition to demonstrating timer accuracy, your tests should be sufficient to show that the source returns to the "off" position at the end of the preset time, and that the source will not return to the "on" position until the timer is reset.

8. Please inform us of the actions you have taken to correct the deficiencies noted by Fred G. Abrath, Ph.D. in his Report on Dosimetry of Radiation Therapy Unit. These deficiencies were noted in 3.1.1 (regarding the reset switch) and in 3.2.5 (regarding need to replace green light over the door).

Please submit the above information in duplicate within thirty (30) days so that we may complete our evaluation of your report. Your response should reference Control No. 04930.

Sincerely,

Francis A. St. Mary
Material Licensing Branch
Division of Fuel Cycle and
Material Safety

Enclosures:
1. Discussion of Restricted and Unrestricted Areas for Teletherapy Licensees
2. NUREG-0339

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