

ATTENTION HOSPITAL ADMINISTRATOR

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D. C. 20555

IE Bulletin No. 76-08

Date: August 9, 1976

TELE THERAPY UNITS

DESCRIPTION OF CIRCUMSTANCES

A recent investigation by the Nuclear Regulatory Commission (NRC) indicates that some NRC-licensed teletherapy units may be operated in such a manner as to deliver a radiation output which differs, outside of acceptable limits, from the calculated output used as a basis for administering the dose prescribed by the physician.

The NRC investigation of the use of a cobalt-60 teletherapy unit at the Riverside Methodist Hospital, Columbus, Ohio revealed that during the period March 1975 through January 1976, the delivered dose from the teletherapy unit was at variance with the medically prescribed dose. The investigation showed that in this case these variances were due to human error in the calculation of the radiation output as derived from a calibration of the teletherapy unit and not due to malfunction of the equipment. The Riverside Methodist Hospital took prompt corrective action when this situation was identified. In considering this situation, NRC also reviewed preliminary results from a study which compared the measured radiation

output with the calculated radiation output of some cobalt-60 units. These preliminary results show that for a fraction of the comparisons made, there are variances outside of acceptable limits between the measured and the calculated output.

In implementing its licensing and inspection procedures the NRC has expected that teletherapy machines are calibrated in accordance with accepted standards of practice. In view of the current information, however, timely action by licensees is necessary to obtain assurance that NRC-licensed teletherapy units will deliver the radiation dose prescribed by the physician.

ACTIONS TO BE TAKEN BY LICENSEES:

All licensees currently authorized by NRC to possess NRC-licensed radioactive material in teletherapy devices for human therapy are requested to:

1. Measure the radiation output (exposure rate or dose rate) from each teletherapy unit under one typical set of machine operating conditions.
2. Compare the measurements obtained in Item 1, above, with the calculated output values used as a basis for administering prescribed doses (such as the calculated values from the physical decay of the radioactive source since the last full calibration).

3. If the measured output obtained in Item 1 differs from the calculated output by more than 5%, perform a full calibration of the teletherapy unit in accordance with accepted standards of practice, such as those recommended by the Scientific Committee on Radiation Dosimetry of the American Association of Physicists in Medicine. (Physics in Medicine and Biology, Vol. 16, No. 3, 1971, pp. 379-396)
4. Report the completion of the requested action and a summary description of the methods used. These reports, which may be released to the public under the Freedom of Information Act, are requested to be submitted within 30 days after receipt of this bulletin to the Director, Division of Materials Inspection Programs, Office of Inspection and Enforcement, USNRC, Washington, D. C. 20555; a copy of the report should be sent to the Director of the appropriate NRC Regional Office listed in Appendix D, Title 10, Code of Federal Regulations, Part 20, or on Form NRC-3. Any questions concerning the instructions in this bulletin should be directed to the appropriate NRC Regional Office.
5. As an alternative to the actions described in Items 1, 2, and 3, above, licensees who participate in a program of national recognition that independently evaluates the output

of teletherapy units may submit, at their option, as the report of Item 4, above, copies of documents showing the results of their participation within the past six months. The programs for which this alternative is acceptable are

- (a) the National Bureau of Standards - Bureau of Radiological Health voluntary cobalt-60 measurement assessment program;
- (b) the Centers for Radiological Physics programs which are sponsored by the National Cancer Institute; and, the Radiological Physics Center program which is sponsored by the American Association of Physicists in Medicine.

Based on a review of the reports and documents submitted, licensees may be required to participate in an NRC-sponsored program to evaluate the radiation output of NRC-licensed teletherapy units. Licensees will be individually contacted as appropriate.

Approval of NRC requirements for reports concerning possible generic problems has been obtained under 44 U.S.C. 3152 from the U. S. General Accounting Office. (GAO Approval B-180255 (R0072), Expires 7/31/77.)

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