



INDIANA UNIVERSITY
MEDICAL CENTER

RADIATION SAFETY OFFICE
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DMB COPY

August 16, 1985

W. L. Axelson, Chief
Nuclear Materials Safety
and Safeguards Branch
U.S.N.R.C. - Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

License No. 13-02752-03 30-1609
License No. 13-02752-08 30-7792

Dear Mr. Axelson:

Attached please find the information requested in your letter dated July 22, 1985. Should you require further information, please do not hesitate to contact this office.

Sincerely,

Mack L. Richard
Mack L. Richard, M.S.
Radiation Safety Officer

Attachments: 2

cc: Glen Irwin, M.D.
Vice President

Walter C. Daly, M.D.
Chairman, Radiation Safety Council

Jon P. Lindemann, M.D.
Chairman, Radionuclide Radiation Safety Committee

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ATTACHMENT 1

OCCUPATIONAL RADIATION EXPOSURES ASSOCIATED WITH CO-60 TELETHERAPY

I. Background Information

During a routine inspection of the activities associated with the use of our Co-60 teletherapy unit (byproduct material license number 13-02752-08), the NRC inspector expressed concern regarding the radiation levels which had been measured by him at the teletherapy console location. This concern was also indicated in a letter associated with the results of said inspection. In both instances, the main concern appears to be that the exposures in the console location are not in accordance with the ALARA (as low as reasonably achievable) philosophy. It was also stated in the aforementioned letter that the whole body exposures to teletherapy operators frequently exceeded our ALARA action levels I and II.

As you are well aware, teletherapy treatment facilities are subject to review and approval by NRC licensing. In addition, results of radiation surveys following the replacement of the Co-60 source (typically at 5 year intervals) are required to be performed and provided to the appropriate NRC section(s). The most recent source exchange occurred August 1, 1980 and the required survey was performed August 2, 1980. The results of said survey were forwarded to the NRC in a letter (and Attachments) dated August 15, 1980. That survey included the radiation levels measured at the console; however, following the submission of that report, there was no indication that these levels were not in keeping with the ALARA philosophy.

In your July 22, 1985 letter, it was stated that our ALARA action levels I and II were frequently exceeded. A careful review of the personnel monitoring records in conjunction with the Radiation Therapy Technologist (RTT) rotation schedule for the years of 1983 and 1984 has since been performed by the Radiation Safety Officer. It is true that ALARA action level I (> 125 mrem/qtr) was exceeded by at least 1 RTT in seven of the eight quarters over the aforementioned two years. At no time has any RTT exceeded ALARA action level II (> 375 mrem/qtr) during those two years or any other time period. There were two quarters where an RTT's film badge was inadvertently left in the treatment room and subsequently exposed; however, those false positive exposures were investigated and documented in our records following their occurrence. It was also noted during our review that due to the frequent rotation of the RTTs, only 1 RTT exceeded 10% of the maximum permissible annual dose equivalent, i.e. 500 mrem (in that case the total annual dose equivalent was 510 mrem). We do recognize that the frequent rotation of personnel solely to reduce individual radiation exposures is not in keeping with the ALARA philosophy; however, radiation exposure is not included in this institution's criteria for the RTT

rotation schedule.

II. Action to be Taken

Within the next 9 to 12 months, we will be submitting an amendment to our teletherapy license to add an additional Co-60 teletherapy unit to our license. Following the installation and NRC approval of this new teletherapy unit, our current teletherapy unit will be utilized to perform whole body irradiations of patients undergoing bone marrow transplantation. Due to this fact, the orientation of the beam will be such that it is very likely that the radiation levels at the console will be less than they are currently for normal teletherapy treatments. These types of whole body irradiations also require a Co-60 source of less activity which means that the radiation levels at the console will most likely continue to decline due to decay. As a part of this project, the Radiation Safety Office will perform measurements around the current teletherapy console to determine if the beam configuration utilized for these whole body irradiations in conjunction with the treatment times and total number of patients to be treated in this manner will reduce the RTT exposure levels below the ALARA action level I. In addition, should the Co-60 source in this teletherapy unit be exchanged in the future for one of greater activity than the current source a re-evaluation of the radiation exposures will be performed. These measurements will be provided to the Radionuclide Radiation Safety Committee (RRSC) for review and appropriate action and to the NRC as required.

ATTACHMENT 2

RESPONSE TO NOTICE OF VIOLATION

I. Notice of Violation - item 1

A. Corrective action taken

A memorandum has been forwarded to the Chief Technologist and copied to the Director of the Division of Nuclear Medicine reiterating the necessity to segregate radioactive and non-radioactive wastes as well as the requirement to perform surveys to verify the presence or absence of radioactivity in various wastes. The Radiation Safety Staff routinely monitors non-radioactive waste containers during the course of their compliance surveys and have found no additional problems of this nature to date.

B. Correction action to avoid further noncompliance

The Radiation Safety Staff will continue the aforementioned monitoring of non-radioactive waste containers and will notify responsible individuals should this problem recur. This violation was also publicized via our Radiation Safety Newsletter which is received by all individuals responsible (Principal Investigators) for the safe use of byproduct materials within university laboratory facilities.

C. Date when full compliance will be achieved

The cause of the elevated reading in the non-radioactive waste container was determined to be a contaminated disposable glove which was subsequently removed. Full compliance was achieved as of that date which was June 27, 1985.

II. Notice of Violation - item 2

A. Corrective action taken

A contamination survey was performed by the Principal Investigator on June 28, 1985.

B. Corrective action to avoid further non-compliance

The standard procedure following a compliance survey by the Radiation Safety Staff is to notify the Principal Investigator in writing of any violations of federal, state, or university regulations. The Principal Investigator responsible for the laboratory mentioned in the Notice of Violation (Wishard WOP-446) was notified in writing on July 22, 1985 and required to respond in

writing. When chronic violations are noted, the violations are reviewed by the Radionuclide Radiation Safety Committee (RRSC) and action taken as appropriate. This violation was also publicized via our Radiation Safety Newsletter which is received by all individuals responsible (Principal Investigators) for the safe use of byproduct materials within university laboratory facilities.

C. Date when full compliance will be achieved

Full compliance was achieved on the date of the contamination survey mentioned in item II., A. above.