



UNIVERSITY OF MINNESOTA
TWIN CITIES

Department of Environmental Health and Safety
Boydton Health Service, Room W-140
410 Church Street S.E.
Minneapolis, Minnesota 55455
(612) 373-3167

June 19, 1985

George M. McCann
Materials Licensing
Region III, US NRC
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. McCann:

The following is a list of the additional information you requested relative to our request to amend University of Minnesota NRC License #22-00187-52, under your Control No. 77376.

- A. Dr. Faiz Khan, Professor, Department of Therapeutic Radiology, will assume responsibility of the safe operation of the panoramic irradiator and for the training and instruction of any other persons who wish to use the irradiator. Dr. Khan is head of the Radiation Physics Section of the Department of Therapeutic Radiology. Three other radiation physicists, Bruce Gerbi, Chris Deibel and Barry Werner will assist Dr. Khan in the training and instruction of persons who wish to use the irradiator. Information on the training and experience of these four individuals is enclosed. Dr. Khan will approve no individual for operation of the irradiator until they have satisfactorily completed the required training and received proper instruction (see section C of this letter). A signed document certifying completion of this training will be kept on file by Dr. Khan and a copy will be forwarded to the Radiation Protection Program.
- B. The Radiation Protection Program will, in cooperation with the Department of Therapeutic Radiology, perform a pre-operational radiation protection survey prior to initiation of use of the Co-60 Teletherapy Unit (panoramic irradiator) to assure compliance with regulations. The Radiation Protection Program will also continue to perform leak tests of the Co-60 source once every six months. Once every three months Dr. Khan and a representative of the Radiation Protection Program will check the facility safety systems (the function of the door interlocks, room radiation monitor, warning lights, etc.) to assure proper operation.
- C. Concerning the training of persons prior to authorization for use, each user will be required to satisfactorily complete the following training and instruction prior to approval to use the irradiator.
 - 1) Completion of the viewing of the University Radiation Protection Training Tapes (1, #2, #3 and #5), which give background information on types of ionizing radiation and sources of radiation exposure, control of

RECEIVED

JUN 24 1985

REGION III

8509110191 850816
REG3 LIC30
22-00187-52 PDR

JUN 24 1985

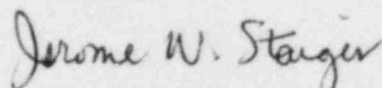
June 19, 1985

external and internal radiation exposure, biological effects of ionizing radiation and dose limits, instructions for occupationally exposed pregnant women and personnel dosimetry requirements. Each trainee must complete the training tape questionnaire. A copy of the questionnaire will be forwarded to the Radiation Protection Program along with a signed document certifying satisfactory completion of all aspects of the training and instruction given to the trainee prior to use of the irradiator.

2. Instruction in the procedures to be followed in the routine operation of the irradiator, and in the event of an emergency situation such as failure of the source drawer to close (see attached operating and emergency procedures). Following this instruction the trainee will be accompanied in an actual step-by-step set up of the operation of the irradiator and review of possible emergency situations and appropriate responses.
 3. Instruction in the proper operation of the room radiation monitor, its location and alarm levels, and the appropriate actions to be taken in the event of an alarm. Instruction in the operation and use of the portable radiation survey instrument which will include: operation and interpretation of instrument readings, use of check source to evaluate instrument response, storage location for instrument and requirements for use when entering irradiation facility after completion of an irradiation. Instruction on the proper use and storage of personnel radiation dosimeters (film badges).
- D. The attached copies of the operating and emergency procedures describe the step-by step sequence to be followed under normal and emergency conditions. All personnel will be assigned personnel radiation dosimeters which they will wear when they are present at the irradiator facility.
- E. The operation of the irradiator facility will not involve the irradiation of flammable or explosive chemicals.
- F. The door to the irradiator room will be equipped with a locking mechanism that has panic hardware on the interior of the door to allow a person to exit from the inside of the facility though the door is locked on the outside.

If you have any questions concerning the information provided, please contact me. Thank you for your assistance in the completion of the review of our request for amendment of this NRC license.

Sincerely,



Jerome W. Staiger
Radiation Protection Officer

JWS:bc
cc: Dr. Faiz Khan
Enclosure

ELDORADO & COBALT TELETHERAPY UNIT OPERATING INSTRUCTIONS

1. Turn on main power switch (located on wall).
2. Insert control console key into console panel and turn clockwise until the green light comes on indicating that the unit power is turned on.
3. From outside of the irradiation room observe that the radiation monitor indicates no elevated radiation level. Observe the warning light above the room door, and observe the unit head (via TV monitor) to make sure that the source is in the off position (source drawer rod on head sticks out when the source is 'on' and is retracted back into the head when the source is in 'off' position).
4. Enter room with the portable radiation survey instrument, leave the door open behind you. Set up experiment. Do not lean on the unit head.
5. Following set-up, instruct all personnel to leave the room. After they have left, push the survey acknowledge button inside the irradiation room (~20 second delay) and proceed out of room yourself. Close door immediately and make sure that no one enters room. Put survey instrument back on storage stand.
6. Push reset button on control console and set timer for desired irradiation time. Turn the unit on by turning the timer switch to 'on' position. The red light on the control console and above the room door will come on when the source is in the 'on' position.
7. If it is necessary to momentarily interrupt an irradiation turn timer switch of 'off' position (green light indicates source off), irradiation can be resumed by turning the timer switch back to 'on' position.
8. Following completion of the irradiation, observe unit head to see that the source drawer has returned to 'off' position, and check control console light and light above room door for indication of source 'off'. Turn off power by removing the key from the control console (turn key counter clockwise). Use portable radiation survey instrument to monitor the radiation level while entering the room.
9. To interrupt an irradiation under emergency conditions, hit the red bar in the control console. This will switch off power to the unit, and the source drawer will be retracted to 'off' position. Observe the radiation monitor and warning lights to assure that radiation levels have returned to a non-operational level.
10. Following completion of irradiation(s) and removal of irradiated samples, clear all personnel from the area and lock the irradiator room door. Record information on irradiator use in the Operators Log Book (name, date of use, time of irradiation initiation, time of irradiation completion).
11. Once every three months the facility operator and a Radiation Protection Program representative will conduct a test of the safety systems of the irradiator facility (door interlocks, warning lights, radiation monitoring instruments). Results of these tests will be recorded in the operator's log book.

EMERGENCY PROCEDURE IN CASE OF SOURCE DRAWER FAILURE
(NON-HUMAN IRRADIATION ONLY)

If the beam does not turn off in normal time (as indicated by red light over door, on stand of treatment head, on control panel, or radiation monitor showing dose rate, proceed thus:

1. Hit the emergency red bar.
2. Lock the door (Do not enter the irradiator room).
3. CALL: a) The Radiation Protection Program, 3-3167 (8:00 a.m. - 4:30 p.m. M-F). If emergency occurs after hours dial 1-3-3 and tell the emergency operator that you have a "Radiation Emergency". Give the operator your name, telephone no., and a brief description of the location of and the nature of the emergency.

4. CALL: b)

		<u>Office</u>	<u>Home</u>
	Dr. Faiz Khan	6-9638	646-3844
OR	Dr. Barry Werner	6-3069	377-0311
OR	Bruce Gerbi	3-8680	739-8260
OR	Dr. Chris Deibel	6-5063	724-9182
<u>AND</u>	Dr. Seymour Levitt	3-8680	944-2850

CURRICULUM VITAE

FAIZ M. KHAN

EDUCATION AND DEGREES: B.S., (Physics, Math, Chemistry, English)
University of Panjab, Emerson College,
Multan, Pakistan, 1953-1957.
Honors degree in Mathematics.
M.S., (Physics)
University of Panjab, Government College,
Lahore, Pakistan,
1957-1959.
Ph.D., (Biophysics)
University of Minnesota,
Minneapolis, Minnesota, U.S.A.
1963-1969.

EXPERIENCE:

20 years experience in radiological physics

Certified by American Board of Radiology in Therapeutic Radiological Physics

PROFESSIONAL EXPERIENCE:

1979 - present	Professor, Department of Therapeutic Radiology, University of Minnesota, Minneapolis, Minnesota.
1974 - 1979	Associate Professor, Department of Therapeutic Radiology, University of Minnesota, Minneapolis, Minnesota.
1973 - present	Director of Radiation Physics Section, Department of Therapeutic Radiology,, University of Minnesota, Minneapolis, Minnesota.
1971 - present	Consultant Physicist, Veterans Administration Hospital, Minneapolis, Minnesota.
1969 - 1974	Assistant Professor, Department of Therapeutic Radiology, University of Minnesota, Minneapolis, Minnesota.
1968 - 1969	Instructor, Department of Therapeutic Radiology, University of Minnesota, Minneapolis, Minnesota.

CURRICULUM VITAE

BARRY L. WERNER

Education:

<u>Degree</u>	<u>Year</u>	<u>Major</u>	<u>Institution</u>
Ph.D.	1972	Physics	Brandeis University, Waltham, Massachusetts.
M.S.	1967	Physics	Brandeis University, Waltham, Massachusetts.
B.S.	1965	Physics	City College of CUNY, New York, New York.

Experience:

10 years experience in radiological physics

Eligible for American Board of Radiology certification

Professional Experience:

July 1979 - present	Assistant Professor, Department of Therapeutic Radiology, University of Minnesota, Minneapolis, Minnesota. Conducts research in the physics of electron beam treatment planning.
October 1975 - June 1979	Senior Physicist, Northeast Center for Radiological Physics, Memorial Sloan-Kettering Cancer Center, New York, New York. Responsibilities included development of the mailed TLD dosimetry program for over 70 affiliated institutions, on-site review of the radiation therapy calibration and treatment planning methods used at the institutions, on-site review of mammography units, reporting findings to the institutions, general computer programming and various developmental projects in TLD, treatment planning, and imaging.
Sept. 1968 - June 1975	Physics Instructor. Taught physics in universities (Brandeis and Harvard), colleges (Regis and Worcester State), a high school (Wayland, Mass.) and in other settings (Brandeis Upward Bound).

CURRICULUM VITAE

BRUCE J. GERBI

EDUCATION

<u>Institution</u>	<u>Date</u>	<u>Major</u>	<u>Degree</u>
University of Minnesota Minneapolis, MN	1982-present	Biophysics	Ph.D. Candidate
University of Pittsburgh Pittsburgh, PA	1974-1976	Medical Physics	M.S.
University of Pittsburgh	1970-74	Biology	B.S.

EXPERIENCE

9 years experience in radiological physics

Certified by American Board of Radiology in Therapeutic Radiological Physics

PROFESSIONAL EXPERIENCE

1983-present	Instructor, Department of Therapeutic Radiology, University of Minnesota, Minneapolis, Minnesota.
1982-Present	Assistant Scientist, Department of Therapeutic Radiology, University of Minnesota, Minneapolis, Minnesota.
1978-1981	Clinical Physicist/Radiation Safety Officer for the group, Norman, Brannan, Riley, Works, Stewart, and Associates, Consulting Radiologists.
1979-Present	Instructor in the Radiation Therapy Technology School at the Cancer Therapy and Research Center, San Antonio, Texas.
1977-1978	Physics Representative to the Clinical Investigative Unit (dealing with clinical protocols), Mallinckrodt Institute of Radiology.
1976-1978	Assistant Clinical Physicist, Physics Section, Mallinckrodt Institute of Radiology, Division of Radiation Oncology.
1976-1978	Instructor in the Radiation Therapy Technology School, Mallinckrodt Institute of Radiology, Division of Radiation Oncology.
1974-1976	University of Pittsburgh, Presbyterian University Hospital, Physics Training Program.

CURRICULUM VITAE

FIRMIN CHRISTOPHER DEIBEL, JR.

Education:

<u>Degree</u>	<u>Year</u>	<u>Major/Minor</u>	<u>Institution</u>
B.A.	1965	Physics/Mathematics	College of Wooster Wooster, Ohio
M.S.	1968	Physics/Mathematics	University of Minnesota Minneapolis, Minnesota
Ph.D.	1979	Animal Physiology/Physics	University of Minnesota Minneapolis, Minnesota

Experience:

5 years experience in radiological physics

Eligible for American Board of Radiology certification

Professional Experience

1969-72	Instructor of Physics, Normandale Community College, Bloomington, Minnesota. (Head of Physics Department: 1971-72)
1970-72	Research Fellow (Part time), Department of Animal Physiology, University of Minnesota, Minneapolis, Minnesota.
1972-77	Research Fellow, and Graduate Student, Department of Animal Physiology, University of Minnesota, Minneapolis, Minnesota.
1977-79	Graduate Student, Department of Animal Physiology, University of Minnesota, Minneapolis, Minnesota.
Jan-June 1979	Research Associate, Robb Research, Roseville, Minnesota.
July 1979 -June 1981	Instructor, Department of Therapeutic Radiology, University of Minnesota, Minneapolis, Minnesota.
July 1981 -Present	Assistant Professor, Department of Therapeutic Radiology, University of Minnesota, Minneapolis, Minnesota.