



University of Pittsburgh

RADIATION SAFETY OFFICE

February 25, 1981

Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

Enclosed are two copies of the renewal application for NRC License #37-00245-05 which expires 3/31/81. This application is made without the use of an NRC form, but provides the information requested per NRC guide entitled Information Required For Renewal Of Teletherapy Licenses (enclosed) sent by the NRC along with draft NUREG-0339 and notification of upcoming license expiration.

Please address the license renewal approval and/or any request for additional information to the undersigned.

Very truly yours,

E. D. Durkosh
Radiation Safety Officer

Enclosures

RKB/cam

8509190589 850910
REG1 LIC30
37-00245-05 PDR

ML10

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07104

FORM RESPONSE FOR TELETHERAPY LICENSE
RENEWAL - PRESBYTERIAN UNIVERSITY HOSPITAL

- 1.) The correct name and address of this license is:

University of Pittsburgh
Radiation Safety Office
Room A550 Crabtree Hall, GSPH
Pittsburgh, Pennsylvania 15261

- 2.) License number to be renewed: 37-00245-05

- 3.) Individual users: 1. John A. Parsons, M.D.
2. Melvin Deutsch, M.D.
3. Vincent Cheng, M.D.
4. Muhammad Afridi, M.D.
5. John H. Webster, M.D.*

ABR - Thur - 1962 p. 3291

*New user: See Appendix A for C.V.

- 4.) No changes from items 7 and 9 of current license.

- 5.) No change from item 8 of current license.

- 6.) An electrical mercury/microswitch interlock system was installed in this teletherapy unit in the summer of 1977 (reference to control no. 86717). This system is designed to prevent the unattenuated primary beam from impinging on wall "D", which faces the outside of Presbyterian University Hospital, one floor above the loading dock.

The interlock system depends on the gantry angle; it provides for any head swivel /gantry angle combination which would allow the primary beam to strike wall "D". Head swivel angles of 40° through 160° are interlocked (with gantry angle 0° in respect to the vertical). This system cannot be easily disabled, either electrically or mechanically.

- 7.) Continuous patient viewing is provided by closed-circuit T.V. monitoring. Radiotherapy technicians turn the monitor on at the beginning of each treatment day, and observe patients continuously during each treatment until the end of the last treatment, when the unit is switched off.

In the event of T.V. monitor failure, patients may be viewed through a leaded glass window in the door of the treatment room. The window is in line with a parabolic mirror which reflects the entire treatment table.

- 8.) Personnel Monitoring Devices

A. Supplier: R. S. Landauer & Company
Glenwood, Illinois 60425

B. Devices Used: For all personnel-physicians, medical physicists and technicians-whole body TLD badges are employed. Additionally, medical physicists who work with the

teletherapy machines, and key personnel who handle brachytherapy sources, wear T.L.D. ring badges.

- C. Frequency of Change: Whole body badges are changed monthly or quarterly; ring badges, monthly.
- D. Other Dosimeters: In the case that the Radiation Safety Office wishes to follow a person's exposure more actively, a digi-dose self-reading dosimeter is worn, this dosimeter is returned to a zero reading before each use. The method of zeroing the instrument is not disclosed to the wearer. The dosimeters accumulate exposure in millirem. They read via L.E.D. display when actuated by the wearer. Directions are given to read dosimeters as required by the exposure situation. Digi-dose electronic dosimeters have a useful range of 1-4999 mRem. Self-reading pocket ionization chambers, which may also be issued, range from 0-200 mR, 0-5R, 0-100R, 0-200R.

All dosimeters are calibrated annually in a dose calibration room, here in this institution, against a Co-60 secondary standard.

- 9.) A. Instruments for surveys and radiation monitoring include those used by both the Radiation Safety Office and by Andrew Bukovitz and Christopher Serago, the resident medical physicists in the Presbyterian University Hospital Joint Radiation Oncology Committee. All instruments are designed for and capable of both beta and gamma detection. See Appendix B for listing of instruments commonly employed by the Radiation Safety Office and by Dr. Bukovitz's group.
- B. All instruments employed by the Radiation Safety Office are calibrated at least annually. The Victoreen and Capintec electrometers employed by Dr. Bukovitz are calibrated every two years; the survey meter he employs is calibrated yearly.
- 10.) Radiation Safety Office instruments are calibrated to Ra-226, using a sealed needle directly traceable to NBS. Calibration factors for Co-60 are then performed using Co-60 sources with known activities and dates. Additionally, a Cs-137 irradiator is available in a calibration room on the premises. Descriptions of beta-gamma calibration sources follow:
- ICN Model CCSD-20E irradiator containing 19.4 curies of Cs-137. (As of 5-30-73, source W-748).
 - $9.9 \pm .7\%$ mg., sealed Ra-226 needle (NBS #47428, as of 11-11-71).
 - 2.2 curie sealed secondary Co-60 source (as of 11-23-73).
 - 62.8 mCi sealed secondary Co-60 source (as of 11-16-73).

The exposure rates from the gamma sources are measured at known distances using a Victoreen Model 510 condenser R-meter and

appropriate R-chambers which are NBS traceable by calibration at Victoreen's Regional Calibration Facility in Cleveland, Ohio. Distance versus mR/hr curves are plotted periodically to account for slight decay (or ingrowth) and to insure repeatability. These curves are used day-to-day for routine calibrations. Instruments are normally calibrated according to manufacturer's instructions. Typically, the instrument is placed in a known radiation field which approximates slightly above meter mid-range; the meter is adjusted to within $\pm 10\%$. Then as a final linearity check, two points at approximately 1/3 and 2/3 full scale for each scale on each range are checked for exposure rate readings at known exposure rate distances. If a true exposure rate versus meter reading exceeds $\pm 10\%$, a calibration graph is attached to the meter. When meter reading versus true reading exceeds $\pm 20\%$, the cause is investigated and instrument repair is initiated.

Radiation Safety Office instruments are calibrated, maintained, and repaired by the Radiation Safety Office Instrumentation Specialist. He has performed this service for the office for nine years.

- 11.) Most instrument calibrations are performed by the licensee. The newly-acquired, factory-calibrated MDH 1015C x-ray monitor will either be calibrated by the manufacturer, or by the Victoreen Regional Calibration Laboratory, 10101 Woodland Avenue, Cleveland, Ohio. The MDH 1015C monitor was manufactured by MDH Industries, Inc., 426 West Duarte Road, Monrovia, California, 91016. Their agreement State license number is California-2787-59.

The Capintec and Victoreen electrometers which Mr. Bukovitz's group use are both calibrated at the Victoreen Regional Facility in Cleveland, Ohio. The Radiation Safety Office Instrumentation Specialist calibrates the Victoreen 440 survey meter used by Mr. Bukovitz.

- 12.) All leak tests on the teletherapy unit are performed by the University of Pittsburgh Radiation Safety Office.

Leak tests are performed by swabbing (ethanol-soaked Q-tip) the region within the collimator opening, at the point shielding the source opening.

Swabs are counted on Nuclear Chicago 4330 windowless gas proportional counters for ten minutes. The detection limit of these counters is approximately 2×10^{-4} μCi . They have a Co-60 gamma detection efficiency of 10%.

Leak tests are performed semi-annually. Records are maintained of all results.

- 13.) Please regard Appendices C and D for emergency procedures and system checks. Appendices C and D are exact copies of those posted in plain view by the teletherapy console.

- 14.) The Presbyterian University Hospital teletherapy unit underwent a source change on 2-13-81, with the installation of a new 6542 Ci Co-60 source. It was hoped that the source would arrive sufficiently early to allow the required radiation survey to be included with this license renewal application. The new source, however, was delayed

in shipment, so that the survey is only now being performed. In order to send this application in timely fashion, the survey report could not be included; it will be submitted within 30 days of installation.

15.) Refer to Item 3.

Curriculum Vitae

File

Name: John Hamilton Webster
Date of Birth: December 17, 1928
Place of Birth: Belleville, Ontario, Canada
Citizenship: American (landed immigrant to Canada - February 1974)
Marital Status: married

Education:

Elementary and Secondary: Public Schools of Picton, Ontario
Higher Education: Queen's University, Faculty of Medicine,
Kingston, Ontario, Canada (1948-1955)
Degrees Received: M.D., C.M.

Professional Background:

Internship: Memorial Hospital, Manchester, Connecticut (1955-1956)
Residency: Therapeutic Radiology, Roswell Park Memorial Institute,
Buffalo, New York (1956-1959)
Certification: Therapeutic Radiology by The American Board of Radiology
(June 1962)

Medical Positions:

July 1959 - Senior Cancer Research Radiologist, Roswell Park Memorial
June 1962 Institute, Buffalo, New York
June 1962 - Associate Cancer Research Radiologist, Roswell Park Memorial
May 1963 Institute, Buffalo, New York
May 1963 - Associate Chief Cancer Research Radiologist, Roswell Park
February 1964 Memorial Institute, Buffalo, New York
February 1964 - Chief of Therapeutic Radiology, Roswell Park Memorial Institute,
March 1974 Buffalo, New York
April 1974 - Professor and Chairman, Department of Therapeutic Radiology,
August, 1979 McGill University, Montreal, Quebec

Medical Positions: (Continued)

April, 1974 - Therapeutic Radiologist-in-Chief
August, 1979 Montreal General Hospital
Royal Victoria Hospital
Jewish General Hospital
The Montreal Children's Hospital

September, 1979- Therapeutic Radiologist
Present Joint Radiation Oncology Center
University Health Center of Pittsburgh
Presbyterian-University Hospital
230 Lothrop Street
Pittsburgh, Pennsylvania 15213

Memberships:

American College of Radiology
American Society of Therapeutic Radiologists
Canadian Association of Radiology
Canadian Medical Association
Canadian Oncology Society
International Association for the Study of Lung Cancer
International College of Radiology
Quebec Medical Association
Society of Chairmen of Academic Radiation Oncology Programs
The Association of Radiologists of the Province of Quebec
The College of Physicians and Surgeons of the Province of Quebec
Allegheny County Medical Society
Pittsburgh Roentgen Society
American Medical Association
Pennsylvania Medical Society

Licenses, Certification:

1. LMCC - 1956
2. New York State License - 1963
3. ABR Diplomate (Therapeutic Radiology) - 1962
4. Province of Quebec License & Specialty Certificate in Therapeutic Radiology - 1974
5. F.R.C.P. (C) & Specialty Certificate in Radiation Oncology - 1978
6. Pennsylvania State License - 1980; #MD-038599 - L

Publications:

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Recurrent Cancer of the Corpus Uteri: Part II - Techniques and Results of Treatment, A.O. Badib, S.S. Kurohara, A.A. Beitia, J.H. Webster, Am. J. Roentgenol, 105 (3): 596-602, March 1969

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Influence of Gravidity on Prognosis in the Common Uterine Cancers, S.S. Kurohara, M.A.Selim, J.H.Webster, J. Patterson, Cancer 27 (5): 1117-1120, May 1971

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Role of Radiation Therapy and of Surgery in the Management of Localized Epidermoid Carcinoma of the Maxillary Sinus, S.S.Kurohara, J.H.Webster, F. Ellis, J.P. Fitzgerald, D.P. Shedd, A.O. Badib, Amer J. Roent., 114 (1): 35-42 January 1972

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COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF STATE
COMMISSIONER OF PROFESSIONAL AND OCCUPATIONAL AFFAIRS
HARRISBURG, PENNSYLVANIA 17120

MEDICAL PHYSICIAN & SURGEON

CERTIFICATE NO.

MD-C38599-L

ISSUED

JUL 11 1980

EXPIRES

DEC 31 1980

JOHN HAMILTON WEBSTER

372 BANK STREET

SEWICKLEY

PA 15143

APPENDIX B

The following lists the instruments utilized in surveys and monitoring by user, manufacturer's name, model number, range, instrument type, and latest calibration date.

OWNER/PRINCIPAL USER	MANUFACTURE/ MODEL NO.	RANGE	INSTRUMENT TYPE	LATEST CALIBRATION DATE
J.R.O.C./Bukovitz, Serago	Capintec 192	2mR- 2000 R	Electrometer/ Ion Chamber	End of 1980*
J.R.O.C./Bukovitz, Serago	Victoreen 570	0-100 R	Electrometer/ Ion Chamber	6/27/80
J.R.O.C./Bukovitz, Serago	Victoreen 440	0-300 mR/hr	Ion Chamber	11/25/80
Radiation Safety Office/Staff	Johnson GSM	0-20 mR/hr.	GM Survey Meter	10/31/80
Radiation Safety Office/Staff	Ludlum 16	0-50 mR/hr.	GM Survey Meter	10/22/80
Radiation Safety Office/Staff	Victoreen 470	0 mR/hr - 1000 R/hr.	Ion Chamber	10/06/80
Radiation Safety Office/Staff	Victoreen Radector	0 mR/hr - 50 R/hr.	Ion Chamber	9/08/80
Radiation Safety Office/Staff	MDH 1015C Monitor	1 mR/hr - 59,940 R/hr	Ion Chamber	Purchased 2/80: Factory Calib.

*Calibration report for Capintec 192 has not been received yet.

EMERGENCY PROCEDURE

IF THE SHUTTER FAILS TO CLOSE,
PROCEED AS FOLLOWS:

1. REMOVE THE PATIENT FROM THE TREATMENT ROOM.
2. THE SHUTTER RETURN EMERGENCY "T" BAR, WHICH IS SUPPLIED WITH THE UNIT AND LOCATED JUST INSIDE THE TREATMENT ROOM, SHOULD BE PLACED OVER THE BEAM CONDITION INDICATING ROD WHICH WILL BE PROTRUDING FROM THE HEAD OF THE UNIT. FORWARD PRESSURE ON THE INDICATING ROD WITH THE "T" BAR WILL PUSH THE SOURCE DRAWER BACKWARDS AND INTO THE "SAFE" POSITION.

NOTE:

The amber colored portion of the emergency "T" bar must be entirely inside the front head cover before the source is in the fully "safe" position. This will reduce external radiation fields to normal levels and allow repairs to be made to the source drawer.

The front portion of the "T" bar is painted red and the source can be considered relatively safe if no red marking appears outside the front cover.

EMERGENCY NUMBERS

Ed Zupan (G.E.)	665-3734
A.G. Bukovitz	364-2014
C. Serago	621-2572
D. Leone	531-7175

EMERGENCY STOP AND COLLISION SYSTEM CHECK

CAUTION: THE OPERATOR IS RESPONSIBLE FOR PERFORMING THE FOLLOWING TESTS ON SAFETY DEVICES ON THIS UNIT. EACH OF THESE ITEMS MUST BE TESTED EACH TIME THE TELETHERAPY UNIT IS STARTED UP.

IMPORTANT: IF ANY OF THESE SAFETY DEVICES MALFUNCTIONS, THE MACHINE MUST NOT BE USED FOR TREATMENT UNTIL THE MALFUNCTION IS CORRECTED.

1. Upon starting up, make certain that the keyswitch returns from the START position to the ON position. The buzzer will continue to signal if the keyswitch remains in the START position.
2. All EMERGENCY STOP buttons should be tested sequentially. These buttons are located as follows:
 - (a) One on the control console (Emergency Stop Bar).
 - (b) One on each side of the couch (Emergency Stop Bar).

To test the EMERGENCY STOP bars on the couch, set the stretcher in the centre of its vertical operating range, depress UP button. With the stretcher in vertical motion, depress the couch EMERGENCY STOP bar. Couch motion should stop, and the BEAM OFF light will extinguish. Power is restored by turning the keyswitch to the START position. To test the EMERGENCY STOP bar on the control console, set the ROTATION SPEED CONTROL for slow rotation, select ROTATION on the treatment mode selector switch, set timer to 30 seconds, switch the treatment timer to ON. With the arm rotating, depress the control console EMERGENCY STOP bar. The arm should stop rotating and the BEAM ON light will extinguish. Power is restored by turning the keyswitch to the START position.

3. The couch collision detector should be tested; with the arm in motion pressing on the stretcher top with a vertical force of 20 lb, should activate the collision detector, stop the arm motion, light the COLLISION lamp on the control console and sound the alarm. If the unit malfunctions, the machine must not be used for treatment and physics immediately notified.