NRC FORM 313
(1-84)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 5-31-87

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [ ] A. NEW LICENSE
- [X] B. AMENDMENT TO LICENSE NUMBER 42-05255-07
- [ ] C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip Code)*

Department of the Army
William Beaumont Army Medical Center
El Paso, Texas 79920-5001

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Same as Item #2

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

MAJ Larry M. Case

TELEPHONE NUMBER: 915-568-5525

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time. Enclosure 1

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED. Enclosure 1

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE. Enclosure 2

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT. Enclosure 3

10. RADIATION SAFETY PROGRAM. Enclosure 4

11. WASTE MANAGEMENT.

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*
FEE CATEGORY | AMOUNT ENCLOSED $

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE–CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
[signature]	BG John E. Major	CG, WBAMC	7 Aug 85

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS
- [ ] <$250K
- [ ] $250K–500K
- [ ] $500K–750K
- [ ] $750K–1M
- [ ] $1M–3.5M
- [ ] $3.5M–7M
- [ ] $7M–10M
- [ ] >$10M

b. NUMBER OF EMPLOYEES *(Total for entire facility excluding outside contractors)*

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION *(dollar and/or staff hours)* ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? *(NRC regulations permit it to protect confidential commercial or financial–proprietary–information furnished to the agency in confidence)*
- [ ] YES
- [ ] NO

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY

AMOUNT RECEIVED | CHECK

DATE

8512050133 851016
REG4 LIC30
42-05255-07 PDR

PRIVACY ACT STA ... REVERSE

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY:** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).

2. **PRINCIPAL PURPOSE(S):** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30, 32, 33, 34, 35 and 40 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.

3. **ROUTINE USES:** The information may be (a) provided to State health departments for their information and use; and (b) provided to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for an NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you.

4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed. A request that information be held from public inspection must be in accordance with the provisions of 10 CFR 2.790. Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned need to inspect the document.

5. **SYSTEM MANAGER(S) AND ADDRESS:** U.S. Nuclear Regulatory Commission
Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

Information in support of Item 5, NRC Form 313:

5a.	5b.	5c.
I-125	Ion exchange, AECL Model C234	200mCi each 250mCi total
Gd-153	GdO_2, Gulf Nuclear Model GD-1	1000mCi each 1300mCi total

Information in support of Item 6, NRC Form 313:

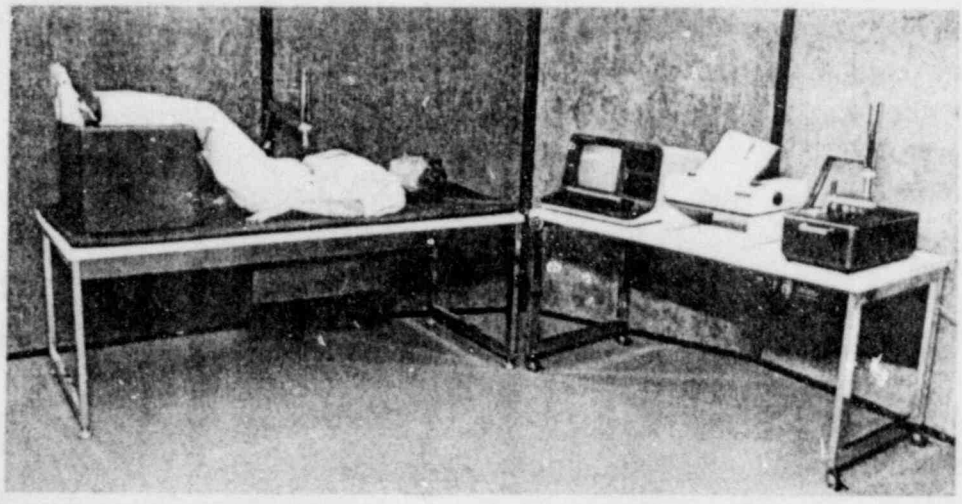
6. The sealed sources listed in item 5 will be used in one of two types of bone mineral analyzers supplied by Lunar Radiation Corporation (see attached descriptive literature). The I-125 will be used in a single-photon scanning attachment, Lunar SP2, with an NRC device registration number of NR-430-D-102-S. The Gd-153 will be used in a dual-photon spine scanning system, Lunar DP3, with an NRC device registration number of NR-430-D-101-S.

Enclosure 1

Rev 12-3

LUNAR RADIATION CORPORATION

DP3 SPINE/FEMUR SCANNER



DESCRIPTION

The DP3 Spine/Femur scanner is the most widely used system for monitoring the axial skeleton in the world today. Used by nearly 90% of existing U.S. facilities, the DP3 has set the standard for dual-photon measurements of the spine and proximal femur and is particularly well-suited for diagnosis and monitoring of osteoporosis.

COMPONENTS

- Rectilinear Scanner Module
- Scanner Table
- Computer Console Table
- Calibration Standard
- Epson FX-80 Printer (optional)
- SP2 Forearm Scanner (optional)
- Northstar Advantage Computer
  - — (640 X 240 pixel display)
  - — dual DSDD disk drives; 27 scans/diskette

SOFTWARE

LUNAR'S sophisticated software makes measurements easy and precise. Automated analysis ensures fast results, but overrides allow the operator to make adjustments if necessary. Correction factors incorporated in the software make measurements independent of tissue cover or position of the bone in the beam path. Calibration to standards allows utilization of existing normal databases and inter-unit comparisons. Intelligent software locates bones of interest and tracks them eliminating positioning problems and dependence on large scan areas. This technique gives lower patient radiation dose, maximum precision, high anatomical resolution, and fast scan times. Scan programs for lumbar spine and proximal femur are standard (typical scan time is 15 minutes). Programs feature automatic location of baselines, bone edges and regions of interest.

RESULTS

Results are graphically displayed, stored on diskette for later analysis, and printed out. Bone mineral content (g), area (cm^2), and density (g/cm^2) are calculated for each region of interest. For the lumbar spine values are given for each vertebra and for varicus combinations. For the proximal femur values are given for the femoral neck, Wards triangle and the trochanter. All data are compared to a normal U.S. database after adjusting for age, body size, sex and race.

RADIATION/LICENSING

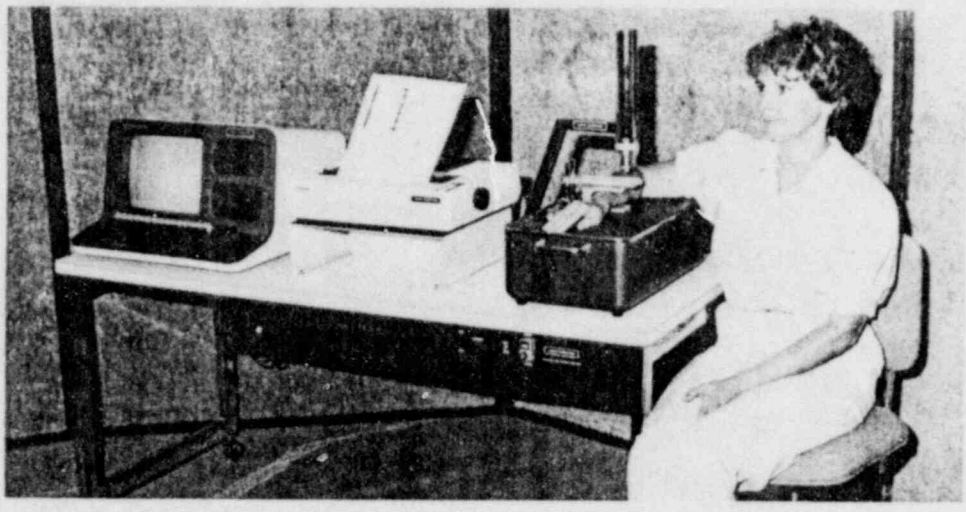
- NRC or state licensing required for a 1 Ci sealed source of 153-Gd.
- NRC device registration number NR-430-D-101-S
- FDA 510K approval (K802180A)
- Dose to patients — under 12 mrem
- Dose to operator — < 0.1 mrem/day
- Source life — 12-18 months typical; up to 24 months

POWER/SPACE

- 110V/60Hz or 220V/50Hz, 630 W
- Single phase, grounded
- Recommended space: 8' x 10'

LUNAR RADIATION CORPORATION

SP2 RECTILINEAR FOREARM SCANNER



DESCRIPTION

The SP2 Rectilinear Forearm Scanner is the industry's most advanced system for determining bone mineral content using single photon absorptiometry (^{125}I). The SP2 is a completely automated scanner that indicates bone density on infants, adults and small animals. The rectilinear scan used by the SP2 allows bone width, distance between bones or anatomical landmarks to serve as the basis for accurate repositioning. Rectilinear scanning minimizes anatomical variation which is the major source of precision error. Scans can be done at the usual shaft and distal sites and at the exclusive ULTRADISTAL site (75% trabecular bone).

COMPONENTS

- Rectilinear Scanner Module
- Scanner Software
- Calibration Standard
- Tissue Equivalent Bolus
- Epson FX-80 Printer (optional)
- Computer Console Table
- Northstar Advantage Computer
  - — (640 X 240 pixel display)
  - — dual DSDD disk drives; 55 scans/diskette

SOFTWARE

LUNAR'S sophisticated software makes system operation easy by using menus and operator prompting. Scan procedures are completely automated but allow for operator override to ensure the most precise results. Total scan time is approximately 10 minutes. Quality control programs are included.

RESULTS

Results are graphically displayed, stored on diskette for later analysis, and printed out. Bone mineral content (g), bone width (cm) and BMC/W (g/cm^2) are calculated for each site. All data are compared to a normal U.S. database after adjusting for age, body size, sex and race.

RADIATION/LICENSING

- NRC or state licensing required for a 200 mCi sealed source of 125-I
- NRC registration number NR-430-D-102-S
- FDA 510K approval (K802181A)
- Dose to patients — typically under 10 mrem
- Dose to operator — $<$ 0.1 mrem/day
- Source life — 6 months
- Source capsule C324 from Atomic Energy of Canada

POWER/SPACE

- 110V/60Hz or 220V/50Hz, 575 W
- Single phase, grounded
- Recommended space: 6' x 6'

LUNAR RADIATION CORPORATION
The leader in bone measurement

916 WILLIAMSON STREET
MADISON, WI 53703
(608) 258-8545

460779

Information in support of Item 7, NRC Form 313:

7. Attached is documentation outlining the training and experience of MAJ Larry M. Case who has been approved by the WBAMC Radiation Control Committee as the new Radiation Protection Officer for WBAMC.

Enclosure 2

FORM NRC-313M-SUPPLEMENT A (8-78) U.S. NUCLEAR REGULATORY COMMISSION

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE
Larry M. Case, Radiation Safety Officer	NA

3. CERTIFICATION

SPECIALTY BOARD (A)	CATEGORY (B)	MONTH AND YEAR CERTIFIED (C)

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING (A)	LOCATION AND DATE(S) OF TRAINING (B)	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) (C)	SUPERVISED LABORATORY EXPERIENCE (Hours) (D)
a. RADIATION PHYSICS AND INSTRUMENTATION	University of Colorado Medical Center (UCMC) Denver, CO Sep 77 - Aug 78	72	48
b. RADIATION PROTECTION	" " "	24	36
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	" " "	24	48
d. RADIATION BIOLOGY	" " "	47	12
e. RADIOPHARMACEUTICAL CHEMISTRY	" " "	36	60

5. EXPERIENCE WITH RADIATION. *(Actual use of Radioisotopes or Equivalent Experience)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Co-60	8900 Curies	WBAMC	4yrs	Therapy
Ir-192	0.3 Curies	WBAMC	4yrs	Therapy
I-125	0.350 Curies	WBAMC	4yrs	Therapy
C_s-137	570 mg-Ra-Eq	WBAMC	4yrs	Therapy
Ze-133	0.05 Curies	UCMC	6mos	Nuc Med
Tc-99m	1.0 Curies	UCMC	6mos	Nuc Med
Ga-68	0.025 Curies	UCMC	6mos	Nuc Med

THE REGENTS OF THE

UNIVERSITY OF COLORADO

HAVE CONFERRED ON

LARRY M. CASE

THE DEGREE

MASTER OF SCIENCE

WITH ALL THE RIGHTS AND PRIVILEGES THEREUNTO APPERTAINING.
IN WITNESS THEREOF THIS DIPLOMA IS AWARDED BY THE REGENTS
UPON THE RECOMMENDATION OF THE FACULTY.
GIVEN AT THE MEDICAL CENTER ON THE TWENTY-SECOND DAY OF DECEMBER, A. D.
NINETEEN HUNDRED AND SEVENTY-EIGHT AND IN THE
ONE HUNDRED SECOND YEAR OF THE UNIVERSITY.

Dick M. Bates Jr.
CHAIRMAN, BOARD OF REGENTS

R. C. Lautenschlaeger
PRESIDENT OF THE UNIVERSITY

John W. Cowee
CHANCELLOR

Willis C. Light
DEAN OF THE FACULTY

UNIVERSITY OF COLORADO
BOULDER, COLORADO 80302
PERMANENT RECORD

NAME CASE, LARRY MILTON

STUDENT NO 123-32-9884

CAMPUS	COURSE TITLE	DEPT.	NUMBER	SEMESTER CREDIT	GRADE	CREDIT POINTS
	FALL 1976 GR-595	123-32-9884		QUARTER HOURS		
3	SYS APPROACH INSTRUMEN	PHMD	610	3	B	9
3	RADIOLOGY	RAD	600	2	B	6
3	RADIATION PHYSICS	RAD	613	1	IPB	3
3	RADIATION BIOL	RAD	614	1	B	3
3	PHYSICS DIAG RAD	RAD	617	2	IPB	6
3	IMAGING SYSTEMS DIAG	RAD	630	2	B	6
	WINTER TERM 1977GR-595	123-32-9884				
3	ON-LINE MED DATA PROC	PHMD	614	3	B	9
3	RADIOLOGY	RAD	600	2	A	8
3	RADIATION PHYSICS	RAD	613	1	IPB	3
3	RADIATION BIOL	RAD	614	1	A	4
3	PHYSICS OF NUCLEAR MED	RAD	616	2	IPB	6
	SPRING 1977 GR-595	123-32-9884				
3	RADIOLOGY	RAD	600	2	IPB	6
3	RADIATION PHYSICS	RAD	613	1	IPB	3
3	RADIATION BIOL	RAD	614	1	A	4
3	PHYSICS THERAPEUT RAD	RAD	615	2	IP	6
3	LOW LEVEL IRRADIATION	RAD	625	2	IPB	6
4	PRIN ELEC & MAGNET	PHYS	332	3	B	9
	SUMMER 1977 GR-595	123-32-9884				
3	RADIOLOGY	RAD	600	2	B	6
	FALL 1977 GR-595	123-32-9884				
3	BIOSTAT METH	BICM	601	2	C	4
3	PARTICLE ACCELERATORS	RAD	618	2	B	6
3	SPEC TOP - NUCLEAR MED	RAD	632	1	A	4
3	HUMAN BIOL & PATHOGEN	BIOL	325	6	P	
	WINTER 1977-78 GR-595	123-32-9884				
3	BIOSTAT METH	BICM	601	2	A	8
3	INT RAD ONCLGY & TRMT	RAD	622	2	A	8
3	SPEC TOP-RAD THER PHYS	RAD	631	1	A	4
	SPRING 1977-78 GR-595	123-32-9884				
3	INTRO ULTRASOUND MED	IDPT	614	2	B	6
3	RADIOISOTOPES RESEARCH	RAD	612	5	IWA	20
3	PHYS OF DIAG RAD	RAD	633	1	A	4
	SUMMER QTR 1978 GR-595	123-32-9884				
3	RESEARCH IN RADIOLOGY	RAD	650	3	A	12

DATE OF BIRTH
10-27-1943

H. S. FROM WHICH ADMITTED

H. S. GRADUATION DATE

MATRICULATION DATE
FALL 1976

OTHER COLLEGES AND DEGREES

ST UNIV. OF N.Y., ALFRED
ST. UNIV COLLEGE AT PLATTSBURGH, N.Y.
UNIV OF MD., COLLEGE PARK
PARK COL., KANSAS CITY, MO., B.A., 1973

ISSUED TO STUDENT

VALID ONLY WITH OFFICIAL SIGNATURE & EMBOSSED SEAL

Byron G. McOmber
UNIVERSITY REGISTRAR
UNIVERSITY OF COLORADO

CURRICULUM VITAE

LARRY M. CASE
MAJOR, MEDICAL SERVICE CORPS, UNITED STATES ARMY

PERSONAL STATISTICS:

Date of Birth:	27 October 1943
Height:	6 Ft.
Weight:	185 lbs.
Health:	Excellent
Status:	Married

CURRENT ADDRESS:

5337 Plainview Drive
El Paso, Texas 79924

EDUCATION:

University of Colorado Medical Center, Denver, Colorado
Master in Physics (Radiological Physics) 1978

Park College, Parkville, MO
Bachelor of Arts in Physics (Magna Cum Laude) (National Physics Honor Society-Sigma Pi Sigma) 1973

PROFESSIONAL/MILITARY EXPERIENCE:

July 1981 - June 1985

Assigned to the Department of Radiology Radiation Therapy Service, William Beaumont Army Medical Center as the Radiological Physicist. Job responsibilities included the calibration of radiotherapy generators and measurement of pertinent machine parameters; performance of individual dosimetric measurements or calculations for specific radiotherapy patients; conducting computerized treatment planning calculations; supervising radiotherapy technologists; monitoring dosimetric calculation procedures used in the clinic; and attending to administrative matters with additional duty as Alternate Radiation Protection Officer for WBAMC.

September 1978 - July 1981

Assigned to the 10th US Army Medical Laboratory, Landstuhl, Germany. Job responsibilities included being the Chief, Department of Radiological Hygiene; Consultant in Radiological Hygiene to the USAREUR Surgeion General; the performance of diagnostic and industrial/nonmedical x-ray and isotope radiation protection surveys and compliance tests to include

	nuclear medicine clinics; conducting limited microwave and laser radiation protection surveys; and formalized radiation protection class presentations.
July 1976 - August 1978	Assigned to the Officer Student Detachment, AHS, Fort Sam Houston with duty at the University of Colorado Medical Center, Denver, CO. Completed graduate studies in Medical Physics. MS awarded. Studies included clinical rotation in Nuclear Medicine, Radiology, Radiation Oncology, Ultrasound and Radiation Safety.
October 1975 - July 1976	Assigned to the US Army Environmental Hygiene Agency, Regional Division West, Fitzsimmons Army Medical Center, Denver, CO. Job responsibilities as Nuclear Medical Science Officer included the performance of diagnostic and industrial x-ray and isotope raidation protection surveys and compliance tests at Army installations located in the Western part of the United States.
October 1973 - October 1975	Assigned to the US Army Environmental Hygiene Agency, Health Physics Division, Aberdeen Proving Ground, MD. Job responsibilities included the conduct of diagnostic and industrial x-ray and isotope radiation protection surveys at numerous Army installations throughout the Continental US; compliance review of Nuclear Regulatory Commission license applications from Army Activities; and supervision of electronic technicians as the Division's Calibration Officer in Nucleonic instruments.
August 1973 - October 1973	USAMEDD Officer Basic Course, AHS, Fort Sam Houston, TX. Direct Commission.
April 1962 - July 1971	Various assignments as an enlisted US Air Force member. Jobs included Precision Measurement Equipment Technician which involved calibration and repair of all types of test equipment and measuring devices and Bomb Navigation System Technician. Honorable discharge.
PROFESSIONAL AFFILIATIONS:	Health Physics Society - Plenary Member American Society for Therapeutic Radiology and Oncology - Associate Member Past Full Member - American Association of Physicists in Medicine

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CURRICULUM VITAE CONT'D

RELATED CONTINUING EDUCATION:

Microwave Oven Survey Techniques Workshop (US Army Environmental Hygiene Agency 1974).

Annual National Conference on Radiation Control (1974).

Nuclear Hazards Training Course (Kirtland AFB, 1974).

ABHP Certification Exam Preparation Course (BRH 1974).

Medical X-Ray Survey Techniques Course (US Army Academy of Health Sciences 1974).

Symposium on Radiation Beam Measurements Using Ionization Chamber Methods (1975).

Microwave/Laser Radiation Protection Course (US Army Environmental Hygiene Agency (1975).

HPS Midyear Symposium (1975, 1976).

Radioisotope Handling and Radiopharmaceutical Quality Assurance Workshop (UCMC 1976).

External Beam, Interstitial and Intracavitary Dosimetry-Principles (M.D. Anderson 1976).

Update on Nuclear Medicine Symposium (Denver, CO 1977).

SNM Rocky Mountain Nuclear Medicine Conference (Denver, CO 1977).

Insights into CT Scanning Symposium and Workshop (Denver, CO 1978).

HPS Central Rocky Mountain Chapter Accelerators Symposium (Denver, CO 1978).

AAPM Workshop on Electron Linear Accelerators in Radiation Therapy (Denver, CO 1978).

JCAH Program on Hospital Accreditation Standards (Ramstien AFB 1979).

The Medical Effects of Nuclear Weapons (AFRRI 1980).

CURRICULUM VITAE CONT'D

Current Trends in Radiation Protection Workshop (US Army Environmental Hygiene Agency 1975, 1979, 1981, 1983).

HPS Annual Meeting (1975, 1982, 1983, 1984).

RSNA and AAPM Joint Meeting (1984).

Health Physics in Radiation Accidents (Oak Ridge Associated Universities 1985).

Annual Meeting of Campus Radiation Safety Officers (1985).

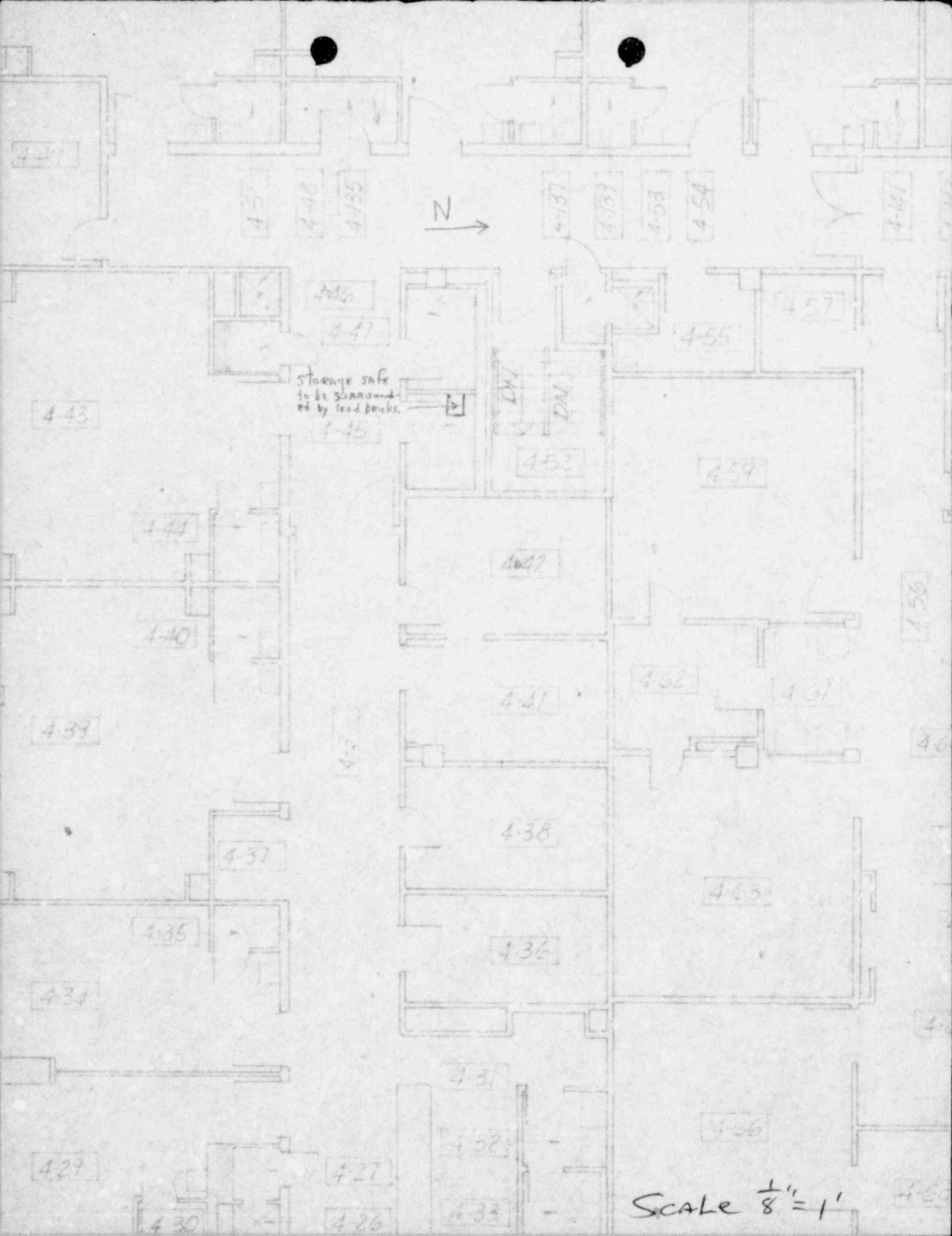
Information in support of Item 9, NRC Form 313:

9. The sealed Sr-90 and Cs-137 sources described in paragraph 11.a.(1), Tab F of our original application 29 March 1979 are to be moved to the 4th floor GYN Ward upon approval of this amendment request. Also, any sealed I-125 or Ir-192 seeds referenced in the same paragraph 11.a.(1) will be stored upon receipt in the same room in the GYN Ward. Storage handling and security of the sources within the room will be the same as previously described in referenced paragraph 11.a.(1); the only difference being that the lead storage safe is located in the north east corner of Room 4-45. Exposure level surveys around the top, bottom and sides of the leaded storage safe and cart indicate that exposure levels outside the new storage Room 4-45 will not exceed 1.37mR in any 24 hour period. The location of the safe will be such that during any loading or unloading procedures the only area which will be subject to higher exposure levels will be a stairwell. The stairwell is only for fire escape and has no general traffic. The steps in this stairwell at the area of concern are approximately 3 feet below the floor level of Room 4-45. As a precautionary measure, however, the source handler will ensure that the adjoining Rooms 4-46 and 4-42 are vacant before any source handling procedures are initiated. Also, the alarm ratemeter referenced in the original paragraph 11.a.(1), Tab F will be located in Rm 4-42. The floor above Room 4-45 is the building physical plant and is unoccupied. The room below is an ultrasound scan room which is presently unused. The ceiling height is over 14 feet, however, so exposure rates to a height of 7 feet will be less than 1.37mR in any 24 hour period. See attached diagram for location of Rm 4-45 and adjoining areas.

The radioactive materials and devices which are intended to be added to our license and are described in Items 5 and 6 will be utilized and stored in Room 12-34, Nuclear Medicine Clinic, WBAMC (floor plan attached).

The equipment information attached is to describe procedures and equipment that the Nuclear Medicine Service, WBAMC desires to utilize as an alternate method in checking their dose calibrator. The present method is described in paragraph 10.b., Tab E of our application. The present method is not to be eliminated.

460779
Enclosure 3


N
storage safe to be surrounded by lead bricks.
4-46
4-47
4-55
4-57
4-43
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4-42
4-40
4-41
4-39
4-38
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4-29
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4-26
4-33
Scale 1/8" = 1'

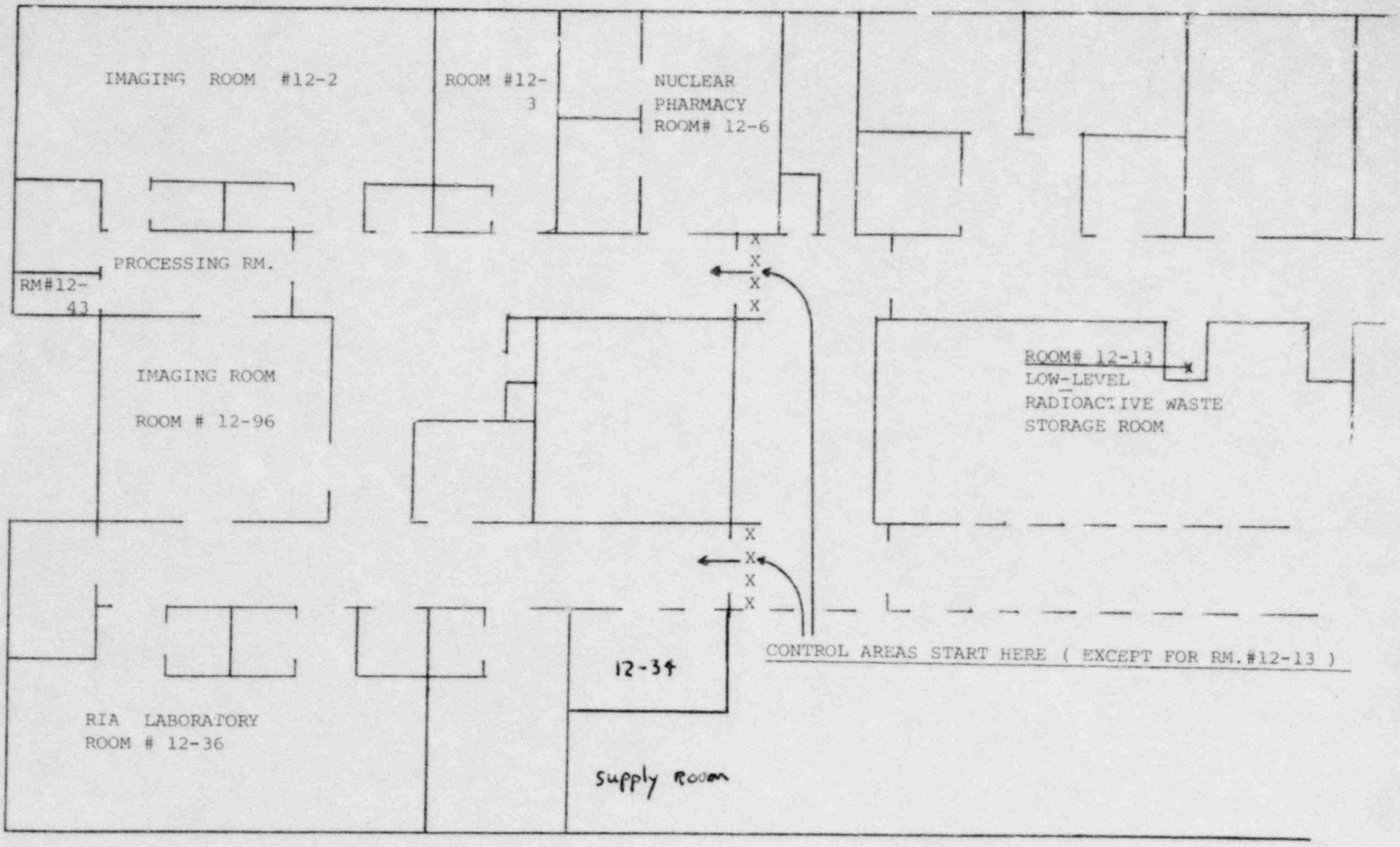

DIAGRAM: NUCLEAR MEDICINE SERVICE; CONTROL AREAS.

LINEATOR INSTRUCTIONS

086-507

Atomic Products Corporation

ATOMLAB DIVISION • ESTABLISHED 1949
P.O. BOX 1157 CENTER MORICHES, NEW YORK 11934 USA
(516) 878-1074
TWX #510-228-0449

Rev. 6/20/83

LINEATOR INSTRUCTIONS

Introduction- the lineator is a simple device for testing linearity and dynamic range of isotope calibrator instruments. Its use simplifies compliance with the Nuclear Regulatory Commission Appendix D of Regulatory Guide 10.8, October, 1980 and various state requirements.

The Nuclear Regulatory Commission, and other licensing agencies typically require a license amendment before use of the Lineator is authorized. A sample license amendment form is included in these instructions as Appendix D. This form should be transferred to your stationary, signed by authorized personnel, and sent to the appropriate agencies with any required fees. When the amendment is received use of the Lineator is authorized. Note that the NRC Regulatory Guide 10.8 Appendix D dated October, 1980 requires test of calibrator linearity at installation and quarterly thereafter. State and local requirements may differ. The Lineator may be used for this quarterly calibration. The concentration of Mo 99 should be less than .1 uCi per mCi of Tc99m.

The Lineator consists of four tubes, three of which are lead lined, which can be arranged concentrically. The smallest diameter tube is labeled 0 and is used to contain and position a source of Tectnetium 99m of the maximum activity to be measured in the dose calibrator in normal service. The lead lined tubes, labeled A,B & C, slide over the central tube, and are used singularly, or in combination. Each of these outer tubes absorbs some of the radiation from the ource and reduces the effective source activity seen by the dose calibrator. Use of the lineator thus allows the operator to simulate a total of eight different source strengths with only one source. The effective reduction increases from tubes A to B to C, and is affected slightly by the shape of the source used, and by the characteristics of the isotope calibrator.

The principle of operation of the Lineator is reproducibility over a wide dynamic range, rather than absolute calibration. Initially the linearity of the dose calibrator must be established by conventional means, such as dilution or decay of a Technetium source. The initial calibration using the Lineator then establishes the effective reductions in activity (ratios of activity with lead tube(s) inserted relative to source in central tubes alone). All subsequent use of the Lineator will show the same effective ratios unless:

1. The dose calibrator becomes defective, at which time it must be repaired, or

2. The Lineator components are damaged or replaced. Care should be taken that the bottom end of the Lineator components are not damaged.

OPERATION

General Instructions:

1. Remove all sources from the vicinity of the calibrator to be tested.

2. Remove the source holder from the calibrator. Remove the chamber liner, if necessary, to allow insertion of the central Lineator tube, tube 0.

3- Set the calibrator to TC-99m, check background reading using most sensitive scales. Zero out the background reading or note the value for later calculations. Check zero on all ranges. Note that background readings which vary widely may indicate a defective machine or a changing radiation environment which will affect the calibration.

4- The Lineator is designed for use ONLY with TC-99m. Load tube C with a vial of 99mTc whose activity is equivalent to the maximum anticipated activity to be assayed (e.g., the first elution from a new generator). The base is formed to center a 10ml or a 20ml vial. Place the tube in the calibrator chamber with the open end up. Use caution to avoid damaging the calibrator or the Lineator. The source and central tube will stay in place until the calibration procedure is complete.

5- Be prepared to work quickly. Arrange Lineator components, data sheets and clock for ease of operation. A complete calibration requires less than 5 minutes. Completion in 7 minutes introduces only a 1% total error due to decay of TC-99m. If linearity test duration exceeds 7 minutes the procedure should be repeated.

6- Set the range switch, as necessary, to read the activity to three significant figures.

CALIBRATION PROCEDURE

Having established the linearity of the calibrator by standard means, an initial calibration provides the factors to be expected for all future linearity checks, so long as the calibrator maintains its linearity and the Lineator components are not damaged.

After performing the steps given in the General Instructions continue with the following steps, adjusting range switch to obtain 3 significant figures:

7- Record the time and the initial activity with the source in the central tube, and only the central tube inserted in the calibrator. Use a data sheet similar to or a copy of Appendix B.

8- Place tube A over the central tube and lower gently. Record reading A.

9- Remove tube A and place tube B carefully over the central tube, record reading B.

10- Insert tube A between central tube and tube B, record reading AB.

11- Remove tubes A & B, insert tube C, record reading C.

12- Add tube A, record reading AC.

13- Remove tube A, add tube B record reading BC.

14- Add tube A, record reading ABC.

15- Record time.

16- Remove and store lineator components, store source in shield.

17- Calculate the eight factors as indicated on the work sheet, Appendix A: Divide the value for the central tube only by the value for each reading for each tube combination and enter results in column headed "Present Factors". Be sure all readings are in the same units (e.g. mCi or uCi). If this is an initial calibration the factors should be retained for future reference and transferred to a master work sheet similar to or a copy of Appendix C, in the column labeled "Initial Factors". Copies of this master work sheet will be used for subsequent calibrations.

If not performing an initial calibration continue with the following steps.

18- Divide each entry in "Present Factors" column by corresponding entry in column labeled "Initial Factors". Enter results times 100 in column labeled Percent Ratio. The ratios should have values near 100.

19- Examine entries in Percent Ratio column (3) to be sure that each is within the allowed tolerance limit for the present radioactive material license. For example, if the license allows 5% variation, all the values in the ratio column should be between 95 and 105. If all ratio values are within acceptable range the calibration is complete and the isotope calibrator has been proven to have acceptable linearity.

If any value of the Percent Ratio is outside the acceptable range renormalize by finding an average value for all eight percent ratio values and dividing each ratio by this average, then multiplying each by 100.

If still beyond tolerance, the problem may be due to:

a- Changing background conditions, including activity in nearby patients. stabilize background activity and repeat.

b- Failure to properly subtract background for each reading. check and repeat procedure if appropriate.

c- Damage to lineator components. Inspect and replace as necessary. Each component may be purchased separately but will require a new initial calibration.

d- A defect in the dose calibrator. This requires repair of the calibrator, followed by a demonstration of linearity using conventional methods, and an initial calibration to establish the factors to be expected with future operation with the Lineator.

20- Sign data sheet and retain for future proof of calibration and compliance with regulations.

APPENDIX A: SAMPLE WORK SHEET

Date: Jan. 2, 1982

Calibrator Serial No.: _____

Operator: J.R.

Source: Tc-99m

ZERO (Background) Reading: 0.00

Range: 0.20 mci (200 uci)

Start Time: 1610

TUBE(S)	Reading-Background	Present Factor (1)	Initial Factor (2)	Percent Ratio (3)
0 only	8.64 mci	1	1	100
0 + A	2.38	3.63	3.64	99.7
0 + B	1.65	5.24	5.28	99.2
0 + AB	0.450	19.20	19.39	99.0
0 + C	0.216	40.0	40.2	99.5
0 + AC	.0615	140.5	141.6	99.2
0 + BC	.0430	201.0	202.5	99.3
0 + ABC	.0123	702	716	98.0

Completion Time: 1615

NOTES: (1) Each factor is the ratio of the reading-background for tube 0 only to the reading-background for that entry.

(2) Values determined from the initial calibration.

(3) % Ratios of entries: 100 x Col. (1)/Col. (2) If any entry in this column differs from 100 by an amount greater than the license allowance see instructions.

APPENDIX B: INITIAL CALIBRATION WORK SHEET

Date: _____

Calibrator Serial No: _____

Operator: _____

Source: _____

ZERO (Background Reading): _____

Range: _____

Start Time: _____

TUBE(S)	Reading-Background	Present Factor (1)	Initial Factor (2)	Percent Ratio (3)
0 only	_____	1	1	100
0 + A	_____	_____	_____	_____
0 + B	_____	_____	_____	_____
0 + AB	_____	_____	_____	_____
0 + C	_____	_____	_____	_____
0 + AC	_____	_____	_____	_____
0 + BC	_____	_____	_____	_____
0 + ABC	_____	_____	_____	_____

Completion Time: _____

NOTES:

(1) Each factor is the ratio of the reading-background for tube 0 only to the reading-background for that entry.

(2) Values determined from the inital calibration.

(3) % Ratios of entries: 100 x col. (1)/Col. (2) If any entry in this column differs from 100 by an amount greater than the license allowance see instructions.

APPENDIX C: WORK SHEET

Date: _____

Calibrator Serial No: _____

Operator: _____

Source: _____

ZERO (Background) Reading: _____

Range: _____ _____

Start Time: _____

TUBE(S)	Reading-Background	Present Factor (1)	Initial Factor (2)	Percent Ratio (3)
0 only	_____	1	1	100
0 + A	_____	_____	_____	_____
0 + B	_____	_____	_____	_____
0 + AB	_____	_____	_____	_____
0 + C	_____	_____	_____	_____
0 + AC	_____	_____	_____	_____
0 + BC	_____	_____	_____	_____
0 + ABC	_____	_____	_____	_____

Completion Time: _____

NOTES:

(1) Each factor is the ratio of the reading-background for tube 0 only to the reading-background for that entry.

(2) Values determined from intial calibration.

(3) % Ratios of entries: 100 x Col. (1)/Col. (2) If any entry in this column differs from 100 by an amount greater than the license allowance see instructions.

APPENDIX D:

AMMENDMENT REQUEST

In order to be in compliance please send the following to your license authority (state or NRC). Remember to use your facility stationary and reference the license number.

NRC or State License #: 42-05255-07

Facility: Wm. Beaumont Army Medical Center

Address: El Paso, Tx

City: El Paso State: TX Zip: 79920-5001

Contact: _____
(Technologist, Consultant, Doctor, Administrator or RSO)

Phone: _____

Gentlemen:

Please ammend our license to allow our dose calibrator to be checked for dose linearity with the model 086-507 Lineator manufactured by Atomic Products Corporation. Test results will be maintained in forms similar to those provided in the manufacturers instruction manual. The test will be performed as per the instruction manual. All corrective actions indicated will be made.

Information in support of Item 10, NRC Form 313:

10. The WBAMC Regulation 40-14 with change 1 dated 28 March 1979 included as Tab H of our original application, 29 March 1979 has been changed in its entirety with an effective date of 22 March 1985. The entire regulation is attached.

Enclosure 4

DEPARTMENT OF THE ARMY
HQ, WILLIAM BEAUMONT ARMY MEDICAL CENTER
El Paso, Texas 79920- 5001

WBAMC Regulation
No. 40-14

22 March 1985

Medical Services

WBAMC RADIATION PROTECTION PROGRAM

The words "he," "his," and "him," when used in this regulation, represent both the masculine and feminine genders unless otherwise specifically stated.

1. PURPOSE. The purpose of this regulation is to:

a. Implement the applicable laws, regulations, conditions, and restrictions under which radioactive materials and x-ray, microwave, radiofrequency (RF) or laser radiation-producing devices are used within WBAMC.

b. Promulgate the rules, direction, and guidance of the WBAMC Radiation Control Committee (RCC) in the proper and safe handling of radioactive material and equipment which produces x-ray, microwave, RF, or laser radiation.

c. Control the procurement, receipt, storage, use, repair, transfer, and disposal of radioactive materials and equipment which produce x-ray, laser, microwave, or RF radiation.

d. Prescribe the radiation protection program for William Beaumont Army Medical Center (WBAMC).

2. GENERAL.

a. The provisions of this regulation apply to all activities and organizations using radioactive material and/or equipment which produce x-ray, laser or microwave radiation, for which the WBAMC Radiation Control Committee (RCC) exercises responsibility. See WBAMC Regulation 15-1 for the scope of the RCC.

b. To facilitate the use and understanding of this regulation, the contents have been divided into separate Appendixes, each dealing with a specific topic. Therefore, it is necessary to consult only the Appendix dealing with the specific matter in question to find the pertinent information.

3. EXPLANATION OF TERMS. As used in this regulation, the following definitions apply:

a. Shall, Will imply a standard, condition, or procedure which must be met if one is to be in compliance with this and other regulations, Federal Law

*This regulation supersedes WBAMC Reg 40-14, 27 Sep 77, with Change 1, 28 Mar 79.

460779

and professional guidance of other authoritative groups which promulgate recommendations for the safe use of radioactive material, laser and microwave sources of radiation.

b. May, Should, Is Recommended imply a standard, condition, or procedure from which one may deviate for good and sufficient reason without violating this or other regulations, Federal Law and professional guidance of other groups which promulgate recommendations for the safe use of radioactive material, laser, and microwave sources of radiation. Decisions to deviate from the accepted procedures in this regulation warrant the careful consideration of the Principal User or other responsible individuals in a supervisory capacity.

4. RESPONSIBILITIES.

a. The Commander, William Beaumont Army Medical Center has overall responsibility for this regulation.

b. The Radiation Protection Officer is the Commander's representative who is directly responsible for overseeing the implementation of this regulation. Temporary minor exceptions to specific provisions of this regulation may be granted on an individual basis by the Radiation Protection Officer (RPO) providing such exemptions do not jeopardize radiological safety or violate law, regulation, the conditions of the USNRC Licenses, or the provisions of DA Authorizations to use radioactive materials.

c. Each user will be directly responsible for all radiation protection within his area of operation. There will be RCC approved Standing Operating Procedures (SOP) posted for his personnel to use. The daily and weekly radiation surveys will be conducted, recorded, and filed by the user organization to be available for inspection. If the using organization has a changing inventory of radioisotopes they must maintain a current inventory of isotope activities on hand and submit a quarterly summary to the Radiation Protection Officer.

5. REFERENCES. Applicable references are summarized in Appendix W.

The proponent agency of this regulation is the Preventive Medicine Service. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to C, PVNTMED Service. (HSHM-PMA-RP).

FOR THE COMMANDER:

IBRAHIM R. MALDONADO
CPT, MS
Adjutant General

23 Encl
Appendixes A thru W

DISTRIBUTION:
Ad Plus: 16(1), 25(1), 26(1), 27(1), 28(1), 29(1), 81(1), 78(25)

INDEX OF APPENDIXES

INDEX of APPENDIXES (continued)

APPENDIX A

AUTHORIZATION TO USE RADIOACTIVE MATERIAL

1. PURPOSE. The purpose of this Appendix is to describe the administrative policies and procedures for the use of radioactive material at WBAMC. This Appendix is applicable to contractor and consultant personnel as well as to WBAMC personnel.

2. GENERAL. William Beaumont Army Medical Center has been issued a DA Authorization and various USNRC Licenses to permit the receipt, possession, storage, use, transfer, and disposal of radioactive material within the Center. No individual may be licensed by the USNRC to use radioactive material at WBAMC; the institution is licensed. Accordingly, possession and use of radioactive materials by individuals within WBAMC is permitted only when specifically authorized by the WBAMC Radiation Control Committee.

3. EXPLANATION OF TERMS.

a. US Nuclear Regulatory Commission (USNRC) License. A license issued to WBAMC which permits the receipt, possession, storage, utilization, transfer and disposal of certain radioactive material at WBAMC. USNRC Licenses are issued for byproduct material, special nuclear material, and source material.

b. Department of the Army Authorizations. An authorization issued by Department of the Army to WBAMC which permits the receipt, possession, storage, utilization, transfer, and disposal of naturally-occurring and accelerator-produced radioactive material at WBAMC.

c. WBAMC Radioisotope Authorization. An authorization issued by the Radiation Control Committee (RCC) to an individual within the authority of the USNRC License and DA Authorization held by WBAMC to receive, possess, store, use, transfer, and dispose of radioactive material. WBAMC Radioisotope Authorizations are subject to the conditions of the USNRC License, the Code of Federal Regulations, Department of Army Regulations, and this regulation.

d. Human Use. Human use of radioactive materials refers to the internal or external administration of radioactive materials, or radiation therefrom, to human beings.

e. Non-Human Use. Non-human use of radioactive materials refers to those applications in which radioactive material is not applied to or injected into human beings. In Vitro studies of human tissues or fluids are included in this category, providing none of the product material is to be administered to humans.

f. Principal User. An individual who, by virtue of his training and experience with radioactive material, has been recommended by the WBAMC Radiation

Control Committee (RCC) to possess and use radioactive material for a specified purpose. A Principal User bears the responsibility for the safe handling of the materials and for proper precautionary measures to protect himself and others from unwarranted exposure to radiation. He may prescribe such rules, procedures, or other restrictions as may be deemed necessary to effect the proper handling of the radioactive material. He is directly responsible to the WBAMC Commander for radiation safety matters.

g. Co-Worker. An individual who possesses adequate training and experience with comparable radioactive material or equipment to qualify him as a Principal User. A Co-worker performs such duties under the Principal User as directed. A Co-worker is responsible to the Principal User for safe and proper handling of radioactive materials.

h. Trainee. An individual who does not possess adequate training and experience to be authorized as a Principal User himself. He is assigned to this category so that he may obtain the necessary experience under the direct supervision of the Principal User and Co-workers. It is the aim of the trainee to obtain suitable training and experience to become qualified as a Principal User or Co-worker.

i. Technician. An individual who, under the supervision of the Principal User or Co-worker, performs certain routine duties involving the use of radioactive material. He does not possess suitable training and experience to be classified as a Principal User or Co-worker, and is not undergoing such training as would qualify him to attain that status. Technicians must be trained in the safe handling of radioactive material, contamination control, and precautionary measures which may be taken to protect themselves and others from unwarranted exposure to radiation.

j. Health Physics. A profession devoted to the protection of Man and his environment from unwarranted radiation exposure.

4. PROCEDURES FOR INITIALLY OBTAINING WBAMC RADIATION CONTROL COMMITTEE AUTHORIZATION TO USE RADIOACTIVE MATERIAL.

a. The Principal User prepares in final form the following documents (the appropriate forms and assistance in their preparation will be furnished by the Health Physics Section, PVNT ED Svc. upon request):

(1) Non-Human Use:

(a) WBAMC Form 19-406, Request for Authorization to Use Radioactive Material (one copy; see Annex 1, this Appendix).

APPENDIX A - continued

(b) NRC Form 313M Supplement A, Training and Experience Authorized User or Radiation Safety Officer (one copy; see Annex 2, this Appendix).

(2) Human Use:

(a) WBAMC Form Request for Authorization to Use Radioactive Material (one copy; see Annex 1, this Appendix).

(b) NRC Form 313M Supplement A, Training and Experience Authorized User or Radiation Safety Officer (one copy; see Annex 2, this Appendix).

(c) NRC Form 313M Supplement B, Preceptor Statement (one copy; see Annex 3, this Appendix).

(d) If the contemplated use is not listed in Appendix E to AR 40-37 and has not been granted NDA status by FDA, the Principal User must submit a protocol for Non-Routine Medical Use of Radioactive Materials as outlined in Appendix D, AR 40-37 (see Annex 4, this Appendix).

b. The Principal User obtains administrative approval from the individual occupying the next higher command position, i.e., the Service Chief's Authorization Request will be approved by the Chief of the Department, etc. The documents are then forwarded to the Radiation Protection Officer.

c. Health Physics personnel will conduct an initial survey of the contemplated laboratory facility to evaluate potential occupational hazards.

d. The Radiation Protection Officer will review the request for adherence to radiation protection practices and for compliance with all requirements. If changes are required to insure the above, appropriate changes will be made to the request after discussion with the requestor.

e. Copies of the documentation will be distributed to the Radiation Control Committee (RCC) for review prior to the next quarterly committee meeting. The committee may recommend command approval following detailed discussion of the protocol outlined in documentation. A subcommittee composed of the Chairman, the Radiation Protection Officer, the Chief, Department of Radiology, and at least one other member, may give interim approval to requests which require action in advance of a regular committee meeting.

f. Following Command approval of the Committee Minutes, the Authorization will be recorded, a number assigned and distribution effected.

5. AMENDMENT OF WBAMC RADIOISOTOPE AUTHORIZATION TO USE RADIOACTIVE MATERIAL. If at any time the applicant desires to deviate from the procedure, the radioisotope, or the specified investigation as described on the approval Authorization, he shall request an amendment to his Authorization by submitting a Request for Authorization to Use Radioactive Material, WBAMC Form describing the proposed changes to his WBAMC Radioisotope Authorization, through the Radiation Protection Officer to the WBAMC RCC.

6. REVIEW AND RENEWAL OF AUTHORIZATION. Current Authorizations will be reviewed at least annually and at other times as deemed appropriate by the Radiation Protection Officer. After review, Authorizations are renewed, discontinued, of revised in accordance with current requirements.

7. ANNEXES.

a. Annex 1, WBAMC Form 19-406, Request for Authorization to Use Radioactive Material.

b. Annex 2, NRC Form 313M Supplement A, Training and Experience Authorized User or Radiation Safety Officer.

c. Annex 3, NRC Form 313M Supplement B, Preceptor Statement.

d. Annex 4, Nonroutine Medical Uses of Radioactive Material.

REQUEST FOR AUTHORIZATION TO USE RADIOACTIVE MATERIAL

DATE

THRU: Radiation Protection Officer
Health Physics Office
Preventive Medicine Service, WBAMC

TO: Radiation Control Committee
WBAMC

FROM: *(Principal User and Organization)*

(List all Co-Workers and respective organizations)

RADIONUCLIDES AND MAXIMUM CURIAGE OF EACH WHICH MAY BE POSSESSED AT ANY ONE TIME

(Select ONE Category)

☐ UNSEALED SOURCE

☐ SEALED SOURCE

RADIOACTIVE MATERIAL WILL BE USED IN

RADIOACTIVE MATERIAL WILL BE STORED IN

USE

☐ HUMAN

☐ NON-HUMAN

DESCRIPTION OF USE *(Use reverse and additional sheets where necessary; list references and show dose calculations where applicable, method of wash disposal, counting or assay procedures.)*

I ACKNOWLEDGE MY RESPONSIBILITIES AS PRINCIPAL USER.

_____
(Signature of Principal User)

ADMINISTRATIVE APPROVAL:

_____
(Signature of Chief of Department, Service or Division)

WBAMC RADIATION CONTROL COMMITTEE APPROVAL

APPROVED:

APPROVED:

AUTHORIZATION NO.

REVIEW DATE

WBAMC FORM 19.406, 7 Jun 77

AFPP-FBT

NRC FORM 313M SUPPLEMENT A
(9-81)

U.S. NUCLEAR REGULATORY COMMISSION

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE

3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES *(Hours)* C	SUPERVISED LABORATORY EXPERIENCE *(Hours)* D
a. RADIATION PHYSICS AND INSTRUMENTATION			
b. RADIATION PROTECTION			
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY			
d. RADIATION BIOLOGY			
e. RADIOPHARMACEUTICAL CHEMISTRY			

5. EXPERIENCE WITH RADIATION. *(Actual use of Radioisotopes or Equivalent Experience)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

NRC FORM 313M SUPPLEMENT B
(9-81)

U. S. NUCLEAR REGULATORY COMMISSION

PRECEPTOR STATEMENT

Supplement B must be completed by the applicant physician's preceptor. If more than one preceptor is necessary to document experience, obtain a separate statement from each.

1. APPLICANT PHYSICIAN'S NAME AND ADDRESS

FULL NAME

STREET ADDRESS

CITY | STATE | ZIP CODE

KEY TO COLUMN C

PERSONAL PARTICIPATION SHOULD CONSIST OF:

1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage.

2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data.

3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.

2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS *(Additional information or comments may be submitted in duplicate on separate sheets.)* D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION		
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME		
	LIVER FUNCTION STUDIES		
	FAT ABSORPTION STUDIES		
	KIDNEY FUNCTION STUDIES		
	IN VITRO STUDIES		
OTHER			
I-125	DETECTION OF THROMBOSIS		
I-131	THYROID IMAGING		
P-32	EYE TUMOR LOCALIZATION		
Se-75	PANCREAS IMAGING		
Yb-169	CISTERNOGRAPHY		
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES		
OTHER			
Tc-99m	BRAIN IMAGING		
	CARDIAC IMAGING		
	THYROID IMAGING		
	SALIVARY GLAND IMAGING		
	BLOOD POOL IMAGING		
	PLACENTA LOCALIZATION		
	LIVER AND SPLEEN IMAGING		
	LUNG IMAGING		
	BONE IMAGING		
OTHER			

460779

PRECEPTOR STATEMENT *(Continued)*

2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN *(Continued)*

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS *(Additional information or comments may be submitted in duplicate on separate sheets.)* D
P-32 *(Soluble)*	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA, AND BONE METASTASES		
P-32 *(Colloidal)*	INTRACAVITARY TREATMENT		
I-131	TREATMENT OF THYROID CARCINOMA		
	TREATMENT OF HYPERTHYROIDISM		
Au-198	INTRACAVITARY TREATMENT		
Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	INTRACAVITARY TREATMENT		
I-125 or Ir-192	INTERSTITIAL TREATMENT		
Co-60 or Cs-137	TELETHERAPY TREATMENT		
Sr-90	TREATMENT OF EYE DISEASE		
	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR		
Sn-113/ In-113m	GENERATOR		
Tc-99m	REAGENT KITS		
Other			

3. DATES AND TOTAL NUMBER OF HOURS RECEIVED IN CLINICAL RADIOISOTOPE TRAINING

4. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OF:

a. NAME OF SUPERVISOR

b. NAME OF INSTITUTION

c. MAILING ADDRESS

d. CITY

5. MATERIALS LICENSE NUMBER(S)

6. PRECEPTOR'S SIGNATURE

7. PRECEPTOR'S NAME *(Please type or print)*

8. DATE

NRC FORM 313M SUPPLEMENT B
(9-81)

ANNEX 4 (NONROUTINE MEDICAL USES OF RADIOACTIVE MATERIAL) to APPENDIX A AUTHORIZATION TO USE RADIOACTIVE MATERIAL)

1. Experimental and nonroutine medical uses of byproduct materials include all human uses not specified in Appendix E to AR 40-37. Such uses may be classified into one of two phases of development:

a. Clinical Research applies to a new use of radioactive material in humans. Little or nothing is known about the procedure and little or nothing has been published on the subject. The basis for proceeding with the new use in humans is derived from knowledge obtained from animal studies. This phase of development includes the initial introduction into humans and initial trials on a limited number of patients.

b. Clinical Evaluation applies to the planned testing of a new diagnostic or therapeutic procedure in an appropriate series of control and diseased humans. The procedure and results of clinical research will ordinarily have been reported in the literature or at meetings. If adequate information has not been published, the applicant should have spent sufficient time with those who developed the test to be thoroughly familiar with the details.

2. The clinical research phase of experimental or nonroutine medical use of radioactive material is normally limited to physicians who have broad experience in the use of radioisotopes and who have appropriate facilities and equipment available to conduct research. The individual physician to be designated as the authorized user should normally have broad and varied experience in the use of radioisotopes and in clinical research investigation.

3. The clinical evaluation phase of experimental or nonroutine medical use of radioactive material is normally limited to physicians under the supervision of an individual physician with broad experience in clinical evaluation and the use of radioisotopes and under the guidance of the Radiation Control Committee representing a number of disciplines. Adequate resources to conduct the trials shall be available.

4. Applications for experimental or nonroutine uses of radioactive material in humans are reviewed by the WBAMC Radiation Control Committee (RCC), and shall be in the format specified by AR 40-38. Applications shall be supported by a research protocol which includes:

a. Title of study.

b. The purpose for conducting the study. Indicate whether the study is to be clinical research or clinical evaluation and explain why.

c. The plan of investigation in sufficient detail to permit a critical evaluation of the methods for conducting the experiments and the controls established.

d. A statement as to whether any planned complimentary drug or radioisotope administration is contemplated in conjunction with the study.

e. A statement about the expected fate of the isotope administered and, if the procedure is for therapy, a statement about the expected effects.

f. If the application is for clinical research, an outline of related work conducted by the applicant or others in laboratory animals and in humans, including data on localization, effective half-life, and radiation dosage. If no work has been conducted in animals, explain why. Pertinent references and a brief abstract prepared by the applicant of published or unpublished material should be submitted (the brochure of a commercial supplier is not a satisfactory authority for this purpose).

g. If the application is for clinical evaluation, pertinent references and a brief abstract prepared by the applicant of published or unpublished material, including information on localization, effective half-life, and radiation dosage should be submitted (the brochure of a commercial supplier is not a satisfactory authority for this purpose).

h. If investigational drugs are to be used clinically in the project on human subjects, the provisions of AR 40-7 apply, and the applicant must include the written approval of the Army Investigational Drug Review Board obtained in accordance with that regulation. Investigational drugs are defined as: "A new drug, not yet approved by the Commissioner of Food and Drugs, Department of Health, Education, and Welfare for general use by the public as a safe and efficacious drug, and that is proposed for clinical study under Department of Army auspices after adequate preclinical information has been obtained."

i. A description of human subjects to be studied:

(1) Persons without manifest disease - number, method of selection, age range.

(2) Persons with manifest disease - number, nature of pathology, method of selection, age range.

(3) Pregnant women will ordinarily be excluded from any test not involving the condition of the pregnancy itself. Specify whether or not pregnant women will be tested and if so, explain why.

(4) Persons under the age of 18 years will ordinarily be excluded from any test involving radiation exposures. Specify whether or not persons under 18 years of age will be tested, and if so, explain why.

APPENDIX B

RESPONSIBILITIES OF PRINCIPAL USER
OF RADIOACTIVE MATERIALS

1. PURPOSE. The purpose of this Appendix is to delineate the responsibilities of a Principal User of radioactive material.

2. EXPLANATION OF TERMS.

a. Principal User. See definition, paragraph 3f, Appendix A.

b. Co-worker. See definition, paragraph 3g, Appendix A.

c. Trainee. See definition, paragraph 3h, Appendix A.

d. Technician. See definition, paragraph 3i, Appendix A.

3. RESPONSIBILITIES.

a. Become thoroughly familiar with the contents of this Regulation prior to using radiation sources.

b. Obtain and use radiation sources as authorized by this Regulation.

c. Take adequate precautionary measures to protect himself and others from unwarranted exposure to radiation.

d. Seek advice and assistance from the Radiation Protection Officer when concerned about the safety of a radiation operation.

e. Prescribe rules, procedures, SOPs, or protocols for the use of radioactive materials under his control to insure their proper and safe use. These will be made available to any radiation worker in that area and will be furnished to the Radiation Protection Officer on request. (See paragraph 4, this Appendix, for a list of suggested radiation laboratory safety rules).

f. Insure that all personnel working under his supervision are familiar with the specific practices to be followed or avoided in the practice of radiological safety. Health Physics will provide in-service radiation safety training when requested.

g. Preclude the misuse of radioisotopes and radiation producing devices by unstable or irresponsible personnel who might endanger themselves or others by their conduct.

h. Insure that all rules, procedures, and practices of radiological safety are employed in the work area.

i. Seek the assistance of the appropriate supervisors for assistance in obtaining cooperation and compliance as needed. Although Health Physics provides the necessary technical advice for radiation protection, enforcement of rules and regulations is the responsibility of the immediate supervisor. Any dispute must be resolved at the lowest possible level of supervision.

j. The Principal User will promptly report known or suspected radiation overexposures to the Radiation Protection Officer. The overexposed individual shall cooperate with any or all attempts to evaluate his radiation overexposure.

k. Maintain a current inventory of the activity of radioactive material on hand to be readily available to the Radiation Protection Officer upon request. The inventory will include the radionuclide(s), activity, and date of that activity.

l. Provide information and assistance to the Radiation Protection Officer which is necessary for the completion of adequate radiation protection surveys.

m. The Principal User is directly responsible for violations of this regulation by personnel working under his authority. Continued violations will be brought to the attention of the Commander through the Radiation Control Committee minutes.

4. RECOMMENDED RULES OF LABORATORY SAFETY FOR RADIATION WORKERS.

a. No eating, drinking, smoking or applying cosmetics in any area where radioisotopes are stored or used.

b. Do not bring food or drink into areas where radioisotopes are used or stored, even if it is to be eaten elsewhere.

c. Do not store food (lunch bags, soft drinks, etc.) in cabinets, refrigerators, etc., which are used or have been used for radioactive material (unless the storage container has been decontaminated and certified as such by the Radiation Protection Officer).

d. Do not use laboratory glassware or equipment for the preparation or consumption of food or drink.

e. Wear protective gloves, aprons, laboratory coats, etc., whenever there is a possibility of contaminating oneself.

Appendix B - continued

f. Protect all breaks in the skin with waterproof material, e.g., rubber gloves, whenever handling radioactive materials.

g. Wash hands thoroughly, including under fingernails, with mild soap and water and a soft brush after handling any radioisotope and monitor hands with a suitable detector before going about any other work or whenever leaving the laboratory for meals, coffee breaks, etc., and especially before eating, drinking, smoking or applying cosmetics.

h. Never wash hands with solvent materials; use mild soap and water and a soft brush as needed.

i. Eliminate sharp objects, e.g., broken glassware, from areas where radioactive materials are used.

j. Wear film badges (dosimeters, if issued) at all times during duty hours, except for medical and dental appointments.

k. When leaving the work area for the day or for medical or dental appointments, leave the film badge (and dosimeter, if issued) in the designated film badge storage area which has been approved by the Radiation Protection Officer in accordance with AR 40-14. Do not wear film badges home or when on TDY without permission from the Radiation Protection Officer.

l. Do not tamper with film badges or dosimeters. Protect them from damage.

m. Mark all radiologically contaminated or potentially contaminated containers and equipment clearly with radioactive marking tape.

n. At the conclusion of each run of the experiment using radioactive material, decontaminate areas, change absorbent paper, clean up equipment, etc., to avoid build-up of contamination.

o. Do not wear laboratory coats which were worn during the use of radioactive material for other work or outside the lab. Contamination on the coat may be spread, absorbed, or ingested if care is not exercised.

p. Never pipet by mouth, not even water. Bad habits, once formed, are not easily broken.

q. Report all known or suspected accidental exposures, contamination, spills, inhalations, ingestions, absorptions, or injections of radioactive material IMMEDIATELY to the Radiation Protection Officer, 568-5525, and to your immediate supervisor. No punative action will be taken against individuals who are accidentally exposed to radiation, either for the accident or for prompt reporting.

r. Dispose of radioactive waste only in receptacles provided. Do not mix radioactive and non-radioactive waste.

s. If a radioactive waste sink is available, follow the posted instructions for use. Be sure to complete the logbook entry.

t. Keep work areas where radioactive materials are used free from unnecessary materials and equipment.

u. Where practical, use absorbant paper to limit the spread of contamination.

v. Use syringe shields when preparing and administering radiopharmaceutical dosages, except in rare circumstances where their use would compromise the patient's well-being. Tongs should be used when vials must be removed from shields or to hold unshielded syringes containing radioactive material for transfer during dosage preparation.

w. Store vials containing radiopharmaceuticals in shielded containers immediately after use in a shielded section of the laboratory that is properly labeled (see Appendix D).

x. Do not handle telephone, reports, etc., with contaminated hands or while using protective gloves.

y. Personnel working with radioactive materials will report IMMEDIATELY to the appropriate supervisor and the Radiation Protection Officer any cuts or skin abrasions occurring during the working hours.

z. The following procedures are to be followed in event of a wound incurred while working with radioactive materials:

(1) Wash the injured area at once with running water. Time is important; even a few seconds may make a considerable difference.

(2) Notify the appropriate supervisor and the Radiation Protection Officer (568-5525).

(3) Self-treatment or antiseptics should not be employed until the wound has been checked by a Medical Officer.

(4) The injury will be reported as required by AR 385-40.

APPENDIX C

ROLE OF WBAMC HEALTH PHYSICS

1. PURPOSE. To delineate the general responsibility of the Radiation Protection Officer pertaining to this regulation.

2. RESPONSIBILITIES OF THE RADIATION PROTECTION OFFICER. A summary of the Radiation Protection Officer's responsibilities are found in the WBAMC Organizational and Functional Manual, however, a more detailed outline of those responsibilities are listed as follows:

a. Advises the Commander, WBAMC, on the control of radiation hazards.

b. Directs all Health Physics activities at WBAMC.

c. Serves as principal WBAMC Action Officer for control of radioactive material and sources of radiation including x-ray, microwave, and laser.

d. Acts as executive agent for the USNRC Licenses and DA Authorizations for the possession, storage, and use of radioactive material for WBAMC.

e. Acts as the custodian of all radioactive materials at WBAMC.

f. Provides advice, assistance, and support of all activities using radioactive material or machine-produced radiation on matters of radiation safety.

g. Conducts and administers education and training programs in the use of radioactive materials.

h. Furnishes technical support to activities with specific requirements which exceed their capabilities.

i. Performs missions which can be effectively consolidated to free individual users and enable them to more effectively utilize their resources toward the accomplishment of their primary objectives. Among these are the following:

(1) Performs radiation protection surveys.

(2) Administers the photodosimetry and bioassay programs.

(3) Radioactive Material Control, including:

(a) Maintains inventory of radioactive material and machines which produce x-ray, laser, or microwave radiation at WBAMC.

(b) Insure compliance with the possession limits, etc., of USNRC Licenses and DA Authorizations.

(c) Renders required administrative reports.

(d) Keeps necessary and required records to insure compliance with pertinent laws and regulations.

(e) Monitors incoming shipments of radioactive material to avoid contamination of the user's facilities and to insure compliance with Federal packaging, labeling, and shipping requirements.

(f) Receives, processes, and ships radioactive waste as generated at WBAMC.

(g) Transports radioactive material throughout WBAMC.

(h) Ships radioactive material from WBAMC in compliance with Federal and Department of Army regulations.

(4) Provides for servicing, repairs, and calibration of portable survey instruments used at WBAMC.

(5) Provides full-range Health Physics support for all users of ionizing and nonionizing radiation sources and devices at WBAMC.

(6) Will respond around-the-clock to meet any contingency involving radiation, radioactive material, or personnel exposure.

(7) Supplies users with certain specialized Health Physics equipment needed for the control of radiological hazards.

(8) Conducts the environmental radiation surveillance program for WBAMC.

(9) Develops and tailors radiation protection programs to meet needs of individual users.

(10) Assists radiation workers in avoiding unwarranted exposure to radiation through close and continuous support.

3. WBAMC RADIATION EMERGENCIES SUPPORT. During WBAMC radiation emergency responses, the Radiation Protection Officer has the responsibility to provide personnel and equipment necessary to allow the Medical Center to function safely for patient care.

4. HEALTH PHYSICS SUPPORT DURING EXPANDED OPERATIONS. During expanded operations, Health Physics support will be provided in accordance with the WBAMC Emergency Preparedness Plan (EPP).

APPENDIX D

CONTROL MEASURES AND PROTECTION STANDARDS
FOR
RADIATION EXPOSURE

1. REFERENCES.

a. Title 10, Code of Federal Regulations, Part 20, U.S. Nuclear Regulatory Commission Rules and Regulations.

b. AR 40-14, Control and Recording Procedures for Exposure to Ionizing Radiation and Radioactive Materials.

c. AR 385-30, Safety Color Code Markings and Signs.

d. NCRP Report No. 39, Basic Radiation Protection Criteria.

2. APPLICABILITY. The definitions and limitations stated in this Appendix are peacetime standards for occupational exposure of personnel to ionizing radiation. Occupational exposure to ionizing radiation is that exposure incurred as a result of an individual's employment or duty. No portion of this Appendix shall be interpreted as limiting the intentional exposure of an individual to radiation for the purpose of medical diagnosis or medical therapy of that individual.

3. DEFINITIONS AND REQUIREMENTS FOR CONTROLLED AREAS.

a. Controlled Area. A controlled area is a defined area in which the occupational exposure of personnel to radiation is under the supervision of the Radiation Protection Officer.

b. Radiation Area. Any area, accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose equivalent in excess of two millirem or in any five consecutive days a dose equivalent in excess of one hundred millirem. Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

"CAUTION"

"RADIATION AREA"

c. High Radiation Area. Any area, accessible to personnel in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose equivalent equal to one hundred millirem. Each High Radiation Area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

"CAUTION"

"HIGH RADIATION AREA"

(1) A High Radiation Area will be established with the approval of the Radiation Protection Officer.

(2) Each High Radiation Area established for more than 30 days shall be equipped with control devices in accordance with 10 CFR 20.203 and 29 CFR 1910.96.

(3) Except in an emergency, no individual shall enter a High Radiation Area until the area has been monitored by Health Physics and approval for his entry has been given by Health Physics.

(4) No individual shall enter or remain in a High Radiation Area unless personnel are immediately available in the vicinity to render assistance.

d. Airborne Radiation Area. Any room, enclosure, or operating area in which radioactive material exists in concentrations in excess of amounts specified in Appendix B, Table 1, Column 1, Title 10, Code of Federal Regulations, Part 20, or any room, enclosure, or operating area in which airborne radioactive material exists in concentrations which, averaged over the number of hours in any work during which individuals are in the area, exceed 25 percent of the amounts specified in the above referenced Code of Federal Regulations. Each Airborne Radioactive Area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

"CAUTION"

"AIRBORNE RADIOACTIVITY AREA"

(1) An Airborne Radioactivity Area will be established with the approval of the Radiation Protection Officer or his representative.

(2) The Radiation Protection Officer shall direct the use of respiratory protective devices, ventilation control measures, and other appropriate actions within Airborne Radioactivity Areas.

e. Areas Where Radioactive Material Is Present. Each area or room and principal container in which radioactive material is stored or used shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

"CAUTION"

"RADIOACTIVE MATERIAL(S)"

Appendix D - continued

Samples, working solutions, laboratory standards, check sources, etc., must be labeled, segregated, or otherwise identified in such a manner that all personnel in the area recognize that radioactive material is present in the object. Radioactive marking tape may be used for this purpose. The label should include the specific nuclide, activity, date (or time) of that activity, name (or initials) of individual responsible for the radioactive material. However, beakers, flasks, test tubes, and other laboratory containers used transiently (within one working day) in laboratory procedures are exempt from labeling requirements, provided they are used in areas which are bordered by warning tape and labeled as containing radioactive material. These provisions shall apply until the containers are properly cleaned, surveyed and released for general use.

f. Contaminated Areas. Any area, including work areas, which are contaminated with radioactive material to levels in excess of values published in Annex 1 to Appendix P of this regulation (Contamination Control and Decontamination Operations).

(1) Any area which may routinely become contaminated during experimental procedures may be posted conspicuously with a sign or signs bearing the radiation caution symbol and the words:

"CAUTION"

"POTENTIALLY CONTAMINATED AREA"

(2) Any area which is contaminated may be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

"CAUTION"

"CONTAMINATED AREA"

(3) All areas designated as "Contaminated Areas" or "Potentially Contaminated Areas" will always be regarded as heavily contaminated and must be surveyed by Health Physics following use and decontamination in order to be considered free of contamination.

g. Special Areas of Concern:

(1) At the discretion of the Radiation Protection Officer, dose rates may be posted for informational purposes at any point.

(2) Specially designated sinks, approved by the Radiation Protection Officer, through which radioactive material may be discharged into the sanitary sewer system shall be conspicuously posted with the radiation caution symbol and the words:

"CAUTION"

"RADIOACTIVE MATERIAL DISPOSAL SINK"

Any radioactive material discharged into the sanitary sewer system by the designated sink will be recorded as amount of solution, activity of material, time and date of disposal, and signature of the individual disposing of the material in the designated sinks' control log book.

(3) All laboratory receptacles for radioactive waste shall be conspicuously posted with the radiation caution symbol and the words:

"CAUTION"

"RADIOACTIVE WASTE"

(4) Equipment containing or likely to contain radioactive material, and equipment requiring special precautions to perform specific tasks, will be posted with a sign stating that approval of the Radiation Protection Officer is required before any maintenance or repair of this item is initiated.

4. RADIATION PROTECTION STANDARDS. Every effort will be made to maintain the radiation dose equivalent as far below the following Radiation Protection Standards as reasonably achievable. Positive efforts will be carried out to fulfill this objective; and, determination of necessity will be weighed against the benefits to be expected.

a. Basic Radiation Protection Standards adopted for the control of occupational exposures to ionizing radiation include:

(1) The accumulated dose equivalent of radiation to the whole-body; head and trunk; active blood-forming organs; gonads; or lens of the eye will not exceed:

(a) 1.25 rem in any calendar quarter, nor

Appendix D - continued

(b) 5 rem in any one calendar year

(2) The accumulated dose equivalent of radiation to the skin of the whole body (other than hands and forearms); cornea of the eye; and bone will not exceed:

(a) 7.50 rem in any calendar quarter, nor

(b) 30.0 rem in any one calendar year

(3) The accumulated dose equivalent of radiation to the hands and wrists or the feet and ankles will not exceed:

(a) 18.75 rem in any calendar quarter, nor

(b) 75 rem in any one calendar year

(4) The accumulated dose of radiation to the forearms will not exceed:

(a) 10 rem in any calendar quarter, nor

(b) 30 rem in any one calendar year

(5) The accumulated dose equivalent or radiation to the thyroid; other organs, tissues; and other systems will not exceed:

(a) 5 rem in any calendar quarter, nor

(b) 15 rem in any one calendar year

(6) Individual(s) under 18 years of age, females known to be pregnant, and occasionally exposed individual(s) will not be exposed to whole body dose equivalent of more than:

(a) 2 millirem in any one hour, nor

(b) 100 millirem in any 7 consecutive days, nor

(c) 500 millirem in any one calendar year, nor

(d) more than 10 percent of the values in (2), (3), (4), and (5), above, for other areas of the body.

(7) Individuals over 18 years of age but who have not reached their 19th birthday may be occupationally exposed to ionizing radiation provided that they do not exceed 1.25 rem dose equivalent to the whole body in any calendar quarter, nor 3 rem in the 12 consecutive months prior to their 19th birthday.

(8) Women of reproductive capacity should be occupationally exposed only under conditions where the dose equivalent to the abdomen will not exceed:

(a) 170 millirem in any calendar quarter, nor

(b) 500 millirem in any 9 month period

(9) Females known to be pregnant will not be occupationally exposed to ionizing radiation more than 4a(6) (a) and (b), and 4a(8), above. It is the responsibility of the female employee to advise her supervisor of the fact that she is pregnant.

b. Radiation Protection Standards adopted for the control of planned occupational exposures to ionizing radiation under emergency situations include:

(1) The Saving of Human Life:

(a) The accumulated dose equivalent of radiation to the whole body should not exceed 100 rem.

(b) The accumulated total dose equivalent of radiation to the hands and forearms should not exceed 300 rem.

(2) Less Urgent:

(a) The accumulated dose equivalent of radiation to the whole body should not exceed 25 rem.

(b) The accumulated total dose equivalent of radiation to the hands and forearms should not exceed 100 rems.

c. Radiation Protection Standards adopted for the control of non-occupational exposures to ionizing radiation includes limiting the use of the sources of ionizing radiation such that the accumulated dose equivalent of radiation to whole body for an individual in the general population (exclusive of natural background and medical and dental exposures) will not exceed 0.5 rem in any one calendar year.

d. When dosimetry indicates that an individual may have received greater than 400 millirem per month whole-body exposure; exposure to unusual concentrations of airborne radioactive material; or the individual believes he may have been exposed to excessive ionizing radiation, the Radiation Protection Officer will direct an investigation of the circumstances of the exposure. A written report of the investigation will be prepared and maintained by the Radiation Protection Officer.

e. When it is determined that an individual may have received a dose of ionizing radiation in excess of the limits stated in paragraph 4a, above, or has been exposed to airborne concentrations of radioactive materials in excess of 25

percent of the amounts specified in Annex 1 to Appendix R when averaged over the number of hours in any week, a report of the finding will be made to the Radiation Control Committee for recommendations of corrective action to be taken. Reports of investigations of overexposures and corrective action will be prepared by the Radiation Protection Officer and submitted through Health Services Command to The Surgeon General and the USNRC in compliance with pertinent directives.

f. The exemption of medical exposure for consideration relative to permissible exposure limits apply only to the patient. All other personnel, such as physicians and technicians administering exposures, are subject to the permissible exposure limits listed above.

5. ACCIDENTAL EXPOSURE TO IONIZING RADIATION. The specific procedures and responsibilities relating to the accidental exposure of personnel to known or suspected overexposures are delineated in Appendix R to this regulation.

a. Internal Exposure. All persons who are known or suspected to have been internally exposed to quantities of radioactive material in excess of the amounts specified in Appendix R of this regulation shall be reported immediately to the Radiation Protection Officer.

b. External Exposure. All persons who are known or suspected to have been externally exposed to radiation levels in excess of those listed in paragraph 4e, above, shall be reported immediately to the Radiation Protection Officer.

APPENDIX E

PERSONNEL MONITORING

1. PURPOSE. The purpose of the personnel monitoring program is to record the exposure of individuals to ionizing radiation and uncover hazardous conditions from ionizing radiation not detected during routine radiation surveys.

2. SELECTION OF PARTICIPANTS. Personnel selected for personnel monitoring will include:

a. Individuals who are likely to be exposed to sufficient radiation from all occupational exposures to receive an accumulated dose in excess of ten (10) percent of the applicable quarterly basic Radiation Protection Standard (see Appendix D, this regulation).

b. Those other individuals selected by the Radiation Protection Officer.

3. DEVICES AND METHODS FOR PERSONNEL MONITORING.

a. A film badge is the primary dosimetric device for personnel monitoring in the Army. It consists of a packet of radiosensitive photographic film in a plastic holder. The following types of film badges are available:

(1) Whole-body badge. Sensitive to beta, x-ray, and gamma radiation and worn to measure the exposure received by the whole body and skin.

(2) Wrist badge. Same as the whole body badge except that it is provided with a wrist band so that it can be used to measure the dose to the wrist.

b. Pocket chambers provide a means of obtaining rapid indications of the accumulated dose over short periods of time. The direct reading personnel dosimeter enables individuals to monitor their own accumulated dose.

c. Various audible pocket ratemeters and integrating dosimeters are also available. These are useful for personnel intermittently exposed to high intensity x-ray or gamma radiation fields.

d. Thermoluminescent dosimeters are useful for dose measurements where other devices are too cumbersome or are otherwise unavailable.

e. Bioassay methods may be employed in some cases to assess the quantity of certain radioisotopes which are present within the body. Available techniques include:

(1) Whole body scanning

(2) Selective organ scanning

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(3) Breath analysis

(4) Urinalysis

(5) Fecal analysis

4. GENERAL GUIDELINES.

a. Each person, except those being exposed to a radiation source for medical purposes, who occupies a Controlled Area for more than a day, will wear a film badge unless specifically exempted by the Radiation Protection Officer.

b. Film badges will not be used for any purpose other than personnel monitoring without the approval of the Radiation Protection Officer.

c. Only those film badges issued from the WBAMC Health Physics Office shall be acceptable in meeting the requirements of this paragraph for persons coming under the scope of this regulation.

d. WBAMC film badges shall not be worn by WBAMC personnel when occupationally exposed at other facilities without the consent of the Radiation Protection Officer, WBAMC. When military or civilian personnel assigned to WBAMC are exposed to ionizing radiation at an installation outside the jurisdiction of WBAMC, they shall ensure that the required exposure information is furnished to the custodian of his DD Form 1141 (Record of Occupational Exposure to Ionizing Radiation). These records are maintained at the WBAMC Health Physics Office.

e. Other dosimetric devices and methods may be employed to supplement the film badge under certain circumstances. The Radiation Protection Officer will designate those individuals authorized to substitute another device or method for the film badge based upon the occupational hazards to which they are exposed.

f. Film badges will be stored in controlled, low dose rate areas in the duty section when not being worn by the individual.

g. Film badges used for personnel dosimetry will not be worn during medical and dental x-ray exposures or when the individual is to receive a radioisotope treatment. Clearance will be obtained from the Radiation Protection Officer before wearing the film badge after completion of radioisotope treatment procedures.

h. Film badges will be worn during duty.

i. The film badge will not be intentionally exposed, tampered with, or damaged.

APPENDIX E - continued

j. Whenever the film badge is thought to have been lost, damaged, accidentally exposed, etc., the Radiation Protection Officer will be promptly notified. A replacement badge will be issued immediately.

k. The whole-body badge should be worn on the torso fully exposed.

l. The whole-body film badge will be worn under the lead apron, and the wrist badge under the lead glove when these protective items are worn.

m. The wrist badge should be worn on the side of the wrist facing the radiation source.

n. Film badges should never be carried in the pocket, subjected to mechanical stress, chemical fumes, heat, humidity, or direct sunlight since these can damage the film and give false results.

o. Film badges will be worn only by the individual to whom they are issued.

5. ADMINISTRATION.

a. Application for film badge service will be made to the Radiation Protection Officer on DD Form 1952.

b. Personnel on permanent film badge monitoring service will be subject to medical examinations in accordance with Appendix F, this regulation.

c. Health Physics will exchange film packets with monitored sections, and send the film packets, along with photodosimetry reports, to The US Army Ionizing Radiation Dosimetry Center, Lexington, Kentucky, for monthly development and exposure evaluation.

d. Records of exposures will be maintained as follows:

(1) The US Army Ionizing Radiation Dosimetry Center maintains permanent records of all exposure readings and returns the Photodosimetry Report (DA Form 3484) to the WBAMC Radiation Protection Officer.

(2) The WBAMC Radiation Protection Officer maintains DD Form 1141 (Record of Occupational Exposure to Ionizing Radiation) for all military and civilian personnel assigned or attached to WBAMC who are participants in the WBAMC Personnel Monitoring Program in accordance with AR 40-14.

(3) The Radiation Protection Officer will send the photodosimetry reports on non-WBAMC personnel (i.e., those persons for whom no DD Form 1141 is maintained by WBAMC, and former WBAMC employees whose DD Form 1141 has been forwarded) to the appropriate custodian of medical records of each monitored individual at intervals not to exceed a calendar quarter. Reports of zero exposure will not be furnished to monitored visitors, unless requested by the visitor or the custodian of his exposure records.

(4) The "Record of Occupational Exposure to Ionizing Radiation" and records of bioassay results on WBAMC personnel shall be made available to the individual or his superiors upon request to the Radiation Protection Officer.

(5) The results of bioassay, whole-body radioactivity measurements, or estimation of internal exposure to persons registered in the WBAMC Personnel Monitoring Program, shall be sent to the Radiation Protection Officer who is responsible for posting data to the DD Form 1141 and other dosimetry files.

e. Personnel monitoring will be discontinued when an individual departs or is assigned duties which, in the opinion of the Radiation Protection Officer, do not warrant continuation. Exposure records will be forwarded to the gaining installation IAW established SOP requirements.

6. INVESTIGATIONS.

a. Health Physics personnel will inquire into all excessive, unusual, or unanticipated exposure results.

b. All film badge readings in excess of 400 millirem will be investigated by Health Physics and a written record of the findings will be prepared.

c. When exposures greater than the limits specified in AR 40-14 are found, a formal investigation will be conducted and a brief explanation of the probable cause of the overexposure will be entered on the individual's DD Form 1141 by the Radiation Protection Officer.

APPENDIX F

MEDICAL EVALUATION OF RADIATION WORKERS

1. GENERAL. It is necessary to periodically evaluate the health of radiation workers in order to provide baseline data for future comparisons, supplement the radiation protection program, provide for timely detection of developing medical problems, and for medicolegal reasons. The references cited in APP W, this regulation, provide guidelines needed for the evaluation of individuals. In order to ensure that all radiation workers at WBAMC receive timely and appropriate medical evaluations, a comprehensive program is needed.

2. PURPOSE. It is the purpose of this Appendix to promulgate the medical evaluation procedures for radiation workers at William Beaumont Army Medical Center based upon applicable regulations, guidelines, and the professional opinions of the members of the WBAMC Radiation Control Committee (RCC).

3. RESPONSIBILITIES.

a. WBAMC Radiation Control Committee (RCC) is responsible for providing guidance and rendering professional opinions regarding suitable medical evaluation procedures for radiation workers at WBAMC.

b. The WBAMC RCC is responsible for determining medical examination policy for all personnel occupationally exposed to ionizing radiation to WBAMC and determining specific parameters for examination in event of a suspected or actual overexposure to ionizing radiation.

c. The Radiation Protection Officer is responsible for:

(1) Classifying individual workers at WBAMC into categories given in paragraph 4, this Appendix.

(2) Providing up-to-date notification of this classification to the Preventive Medicine Officer.

(3) Detecting working conditions which could result in an accidental ingestion, inhalation, injection, or absorption of radioisotopes by workers, taking action to reduce such hazards, and calling the areas of hazard to the attention of the Preventive Medicine Officer.

d. The Preventive Medicine Officer or his designated representative is responsible for:

(1) Determining the nature of special studies, organ function tests, and bioassays which might be of benefit in the medical evaluation of workers who are exposed to potential hazards from the use of radioisotopes.

(2) Evaluating the results of such directed studies which are not part of a routine medical examination.

(3) Insuring that the Physical Examination Section implements the decisions made and considers the results of such studies, assays, and tests as part of the medical examination of those specific workers.

(4) Providing advice and guidance to examining physicians concerning the scope and conduct of medical examinations for radiation workers.

(5) Seeking the advice of specialists and/or members of the RCC in any instance where such advice might assist in determining the exact nature of the hazard, the critical organ, and the nature and usefulness of the studies undertaken.

4. CATEGORIES OF PERSONNEL. Personnel working with radiation will be divided into four major categories according to the hazard to which they are exposed. The categories are mutually exclusive in most instances; however, some individuals may fall into more than one category. Such individuals should be examined in accordance with requirements of both categories.

a. Personnel Exposed to an Internal Radiation Hazard. This group includes those individuals who, by virtue of their duties, routinely are in the proximity of unsealed radioactive material and, therefore, potentially subject to inhalation, ingestion, absorption, or injection of such material into their bodies.

b. Personnel Exposed to an External Radiation Hazard. Those individuals who are potentially exposed to x-ray or gamma radiation emanating from x-ray machines, sealed gamma sources, etc.

c. Personnel Exposed to Laser Radiation Hazard. This group includes those individuals who, by virtue of their duties, routinely are in the proximity of laser devices.

d. Personnel Exposed to Microwave Radiation Hazard. This group includes those individuals who, by virtue of their duties, routinely are in the proximity of microwave devices.

5. MEDICAL EVALUATIONS.

a. Initial Examinations. Preplacement/pre-employment medical examinations are required:

(1) For workers exposed to ionizing radiation hazards, this examination should include a routine medical examination using SF 88 and 93 for military personnel and SF 78 for civilian personnel, a review of prior occupational exposure, and a description of any unusual exposure to ionizing radiation resulting from previous occupations, accidents, or diagnostic procedures. Any therapeutic exposure will be listed by the dosage and the areas treated. This information on diagnostic and therapeutic radiation will be recorded as a portion of the history,

APPENDIX F - continued

but will not be entered on DD Form 1141 (Record of Occupational Exposure to Ionizing Radiation). The family and personal medical history will note the presence or absence of cancer, blood dyscrasis, thyroid disease, history of recurrent abortion, congenital malformation, or any other conditions which may be associated with exposure to ionizing radiation. Sufficient blood counts (white cell count with differential, red cell count, hemoglobin, hematocrit, and platelet count) to establish a baseline will be performed. Personnel exposed to an internal radiation hazard may receive whole body count, bioassay studies, selective organ scans, and/or other appropriate additional studies if directed for that individual by the Preventive Medicine Officer.

(2) Personnel routinely exposed to hazardous laser radiation shall have a preplacement medical examination, a termination of employment examination, and be included in an occupational vision conservation program. The medical examination shall be performed in accordance with TB MED 524.

(3) Personnel potentially exposed to hazardous levels of microwave or radiofrequency (RF) radiation, as determined by the Radiation Protection Officer, shall have a preplacement medical examination and a termination of employment examination, in accordance with AR 40-583.

(4) The decision as to the acceptability of the individual into the occupational program will be rendered by the examining physician(s). The examining physician(s) may defer the decision as to the acceptability of an individual by referring the results of his examination to the Radiation Control Committee (RCC).

b. Periodic Examinations.

(1) Routine physical examinations for all radiation workers exposed to ionizing radiation hazard, whether military or civilian, are to be administered as required in accordance with AR 40-14.

(2) For workers routinely exposed to laser radiation hazard, or potentially hazardous levels of microwave/RF radiation, periodic eye examinations will be conducted as required in accordance with AR 40-46 for laser hazards and AR 40-583 for microwave/RF radiation, or when there is reason to believe that eye damage may have occurred. The examination should include a careful review of general and eye symptomatology. The performance of a physical examination, comprehensive eye examination, or laboratory procedures as indicated by the history will be performed at the discretion of the examining physician. More detailed and frequent examinations may be indicated, dependent upon the capability of the medical facility and the extent of the exposures.

c. Special Examinations. Routine bioassay, scanning, whole-body counting, or other special studies of personnel will be restricted to those tests specifically designated on an individual basis at the discretion of the attending physician or Preventive Medicine Officer.

d. Final Examination. At the termination of assignment of an individual to a position which warrants classification as a radiation worker, a final medical examination will be conducted. This examination is similar to the initial examination except that only an interim history need be recorded for the purpose of this regulation. The examination will always include a CBC with platelet count. Previously conducted special examinations which resulted in abnormal findings may be repeated as part of the final examination at the discretion of the attending physician or the Preventive Medicine Officer.

6. MEDICAL SURVEILLANCE OF OCCUPATIONALLY EXPOSED PERSONNEL.

a. Special Cases. If the Radiation Protection Officer identifies areas of particular hazard from radioisotopes, especially areas of potential internal hazard from radioisotopes, he will take appropriate action to minimize the hazard and will advise the Preventive Medicine Officer of the hazard. The Preventive Medicine Officer, seeking whatever consultation he deems necessary, will direct the appropriate additional studies, organ function tests, bioassays, whole-body scans which might be of medical benefit in the evaluation of suspected exposure of the individual. He will insure that such studies are conducted and that the results are evaluated by well-trained professional personnel.

b. Consultations. Professional advice in the area of radiation exposure is available from Chief, Ophthalmology; Chief, Radiology; Chief, Nuclear Medicine; and Chief, Radiation Therapy. Any physician engaged in the evaluation of radiation workers may seek advice from any of these individuals to assist in such evaluations.

c. Reports. Abnormal medical findings discovered during medical examinations of radiation workers will be IMMEDIATELY reported to the RCC for appropriate action. The Radiation Protection Officer (phone: 568-5525) will coordinate such reporting.

APPENDIX G

PREGNANCY SURVEILLANCE PROGRAM

1. Female radiation workers are included in the WBAMC Pregnancy Surveillance Program. It is the responsibility of both the individual and her supervisor to notify the Radiation Protection Officer, WBAMC, immediately upon learning of a confirmed pregnancy.

2. In cases where the pregnant employee is exposed to ionizing radiation, the Preventive Medicine Officer and the Radiation Protection Officer will survey the working environment and will, in conjunction with the employee's personal physician, determine the advisability of her continuing work in this environment for the duration of her pregnancy.

3. The Preventive Medicine Officer will make specific recommendations to the appropriate personnel branch for a change in working environment during pregnancy when it is considered medically desirable in individual cases.

4. Confirmed cases of pregnancy will receive a benefit/risk briefing based on USNRC guidelines. A signed statement of understanding and receipt of the briefing will be on file in using activity.

5. Radiation benefit/risk briefings will be provided all female radiation workers of child bearing age as in-service training by the Radiation Protection Officer.

APPENDIX H

PROCUREMENT, RECEIPT, STORAGE, AND TRANSFER OF RADIOACTIVE MATERIAL

1. PURPOSE. The purpose of this Appendix is to prescribe the procedures for procurement, receipt, storage, and transfer of radioactive material at WBAMC in order to assure compliance with applicable USNRC Licenses and DA Authorizations.

2. GENERAL. The Radiation Protection Officer (RPO) is responsible for maintaining a current inventory of radioactive material at WBAMC and insuring that the quantity of radioactive material on hand does not exceed amounts permitted under WBAMC's USNRC Licenses and DA Authorizations. Accordingly, the RPO must be consulted prior to the procurement or transfer of all radioactive material.

3. PROCUREMENT OF RADIOACTIVE MATERIAL.

a. The WBAMC Radiation Control Committee (RCC) will designate those persons authorized to order radioactive material. The RPO will provide to the Chief, Logistics Division, a list of all persons authorized by the WBAMC RCC to purchase radioactive material.

b. Radioactive material will be ordered only after it is ascertained by the RPO or his designated representative that receipt of the material will not cause the amount on hand to be in excess of quantities permitted in the appropriate USNRC License or DA Authorization.

c. All purchases of radioactive material must be identified as such and must be identified as being ordered under the appropriate USNRC License or DA Authorization. Purchasers will obtain USNRC License numbers from the RPO.

d. Gifts and/or free samples of radioactive material will not be accepted unless approved by the RPO.

e. A copy of the appropriate USNRC License or DA Authorization will be furnished to each supplier of radioactive material upon request to the RPO. Federal law requires that a supplier of radioactive material verify the purchaser's authority to possess the type and quantity of each radioisotope ordered from him.

f. Radioactive material will be borrowed from or lent to other licensed users or licensees only with approval of the RPO who will prescribe necessary control procedures. Emergency transactions will be reported to the RPO the next working day following the transaction.

g. Possession of radioactive material by persons not authorized for use of that radioactive material by the WBAMC RCC is strictly forbidden. Gifts and erroneous shipments which fall in this category will be reported immediately to the RPO, who will determine the disposition of the radioactive material. Cases

of repeated or willful violation of this provision will be referred to the WBAMC RCC, which may recommend disciplinary action to the Commander.

4. RECEIPT OF RADIOACTIVE MATERIAL.

a. Receipt, use, and ultimate disposition of radioactive material will be documented as follows:

(1) A DA Form 4574-R, Radiopharmaceutical Stock Record (see AR 40-37), will be initiated for each radiopharmaceutical shipment received at WBAMC. Each debit against the balance will be entered, and the ultimate disposition of the shipment will be noted on the DA Form 4574-R.

(2) A WBAMC Form 149, RIA Material - Kit Usage (Annex 1, this Appendix), will be initiated for each in vitro radioassay kit shipment received at WBAMC. Each debit against the balance will be entered, and the ultimate disposition of the shipment will be noted on the WBAMC Form 149.

(3) Receipt of sealed radioactive sources for radiation therapy which are either permanent implants or are returned to the manufacturer after use, will be recorded on DA Form 4574-R, Radiopharmaceutical Stock Record. Each use of the sources will be entered, and the ultimate disposition of the shipment will be noted on the DA Form 4574-R.

(4) Receipt of unsealed radioactive material for in vitro or animal research will be recorded on DA Form 3862, Controlled Substances Stock Record. Each debit against the balance will be entered on the DA Form 3862.

(5) Departments and services utilizing large numbers and amounts of radioactive materials, and having automated data processing (ADP) capability, may use this capability for recording receipt, use, and ultimate disposition of radioactive material shipments, provided at least all information required is included in the program.

b. The Radiation Protection Officer (RPO) or his designated representative, upon receipt of a package of radioactive material, will monitor the external surfaces of the package for radioactive contamination caused by leakage of the radioactive contents. Packages will be monitored in accordance with Section 20.205 of 10 CFR Part 20.

c. The RPO will be responsible for all notifications and reports prescribed in Title 10, Code of Federal Regulations and arising from receipt of contaminated or leaking shipments of radioactive material.

d. The RPO will prescribe the disposition of all gifts and erroneous shipments of radioactive material received at WBAMC. Procedures for after hours receipt of radioactive material will be placed in the Administrative Officer of the Day (AOD) procedures book. Assistance from the RPO or his alternate will be available for after hours emergencies.

APPENDIX H - continued

e. Under no circumstances will an incoming shipment of radioactive material be refused.

5. STORAGE OF RADIOACTIVE MATERIAL.

a. All radioactive material, except radiation therapy sealed sources and BACTEC blood culture vials, will normally be stored in the Nuclear Medicine Clinic and a designated storage area in the Clinical Investigation Laboratory. Exceptions may be approved by the RPO if the exception is not prejudicial to the health and safety of personnel.

b. Radioactive material will be stored in a secure area adequate to protect against vandalism and theft. The RPO will post storage areas with appropriate warning signs.

c. Users are responsible for surveying radioactive material storage rooms no less frequently than once a month and keeping records of these surveys.

6. TRANSFER OF RADIOACTIVE MATERIAL.

a. The transfer and/or use of radioactive material shall be in accordance with guidelines prescribed by the RPO, including this regulation and subsequent written or oral directives.

b. Each transfer and/or use of radioactive material will be described on the appropriate DA Form 4574-R, DA Form 3862, or WBAMC Form 149.

c. Transfer of radioactive material to other Users at WBAMC or other licensees outside WBAMC must have the approval of the RPO. The RPO must have on file a copy of the USNRC or Agreement State License of the person to whom the radioactive material is being transferred, and the License must authorize possession of the type and quantity of radioactive material requested. The transferor is responsible for furnishing a completed DA Form 2791-R, Radioactive Materials Movement, for each shipment of radioactive material from WBAMC. The RPO will survey packed radioactive material prior to its shipment. He will also insure that the package is properly labeled.

d. Disposal of unwanted radioactive material and radioactive waste is described in Appendix J and AR 385-11.

1 Annex
WBAMC Form 149

RIA MATERIAL - KIT USAGE

PRODUCT_____ DATE RECEIVED_____ INITIAL_____ EXP DATE_____

TOTAL ACTIVITY_____ NO OF TUBES_____ LOT NO_____

DATE	RUN NO	STANDARDS	CONTROL	PATIENTS	TOTAL	BALANCE
	BEGINNING BALANCE					
TOTALS						

WBAMC FORM 149, 1 Nov 79

DATE	RUN NO	STANDARDS	CONTROL	PATIENTS	TOTAL	BALANCE
	BALANCE FORWARD					
TOTALS						

APPENDIX I

ACCOUNTABILITY AND INVENTORY OF RADIOACTIVE MATERIAL

AND

MACHINES WHICH PRODUCE IONIZING RADIATION

1. RESPONSIBILITIES.

a. The Radiation Protection Officer is responsible for the physical inventory and accountability for all radioactive material and ionizing radiation producing devices in accordance with AR 385-11, AR 40-61, and Title 10 Code of Federal Regulations.

b. The Radiation Protection Officer is responsible for insuring that the total inventory of any radioisotope does not exceed the possession limitations for that isotope allowed by the DA Authorizations or USNRC Licenses.

c. Each Principal User is responsible for control, security, and inventory of all radioactive material in his possession. He will insure the maximum quantity which he has on hand does not exceed the possession limit stated in his WBAMC Radioisotope Authorization. Quantities in excess of his possession limit will be returned to the Radiation Protection Office for storage until needed.

2. PROCEDURES.

a. Inventory of radioisotopes authorized under the Non-human Use Authorizations will be inventoried quarterly. The Principal User will consolidate the inventory which will be verified by the Radiation Protection Officer.

b. Inventory of radioisotopes authorized under Human Use will be inventoried quarterly at the end of the period. Chief, Nuclear Medicine Service and Chief, Radiation Therapy will consolidate the inventory which will be verified by the Radiation Protection Officer.

c. Machines and devices which produce ionizing, laser and microwave/RF radiation will be registered with the Health Physics Office where a register is maintained. Update and verification of the register will be conducted annually.

APPENDIX J

RADIOACTIVE WASTE

1. PURPOSE. To prescribe the policies and procedures to be followed in the management of radioactive waste at WBAMC in order to insure compliance with pertinent laws and regulations.

2. RESPONSIBILITIES.

a. The Radiation Protection Officer is responsible for the management and control of radioactive waste to include effluents released to the unrestricted environment.

b. Principal Users are responsible for segregation, packaging and delivery of radioactive wastes generated under their control to the areas designated by the Radiation Protection Officer.

c. Individual Users are responsible for:

(1) Keeping the inventory of radioactive waste in their possession as low as practical.

(2) Providing containers for their radioactive waste.

(3) Properly identifying the contents of their waste, to include radioisotope, activity, date and authorization number as required by the Radiation Protection Officer.

3. POLICIES AND PROCEDURES.

a. Radioactive waste is excess or surplus unwanted radioactive material or material contaminated with radiation to the extent that decontamination is judged unsound or the contamination cannot be reduced to an acceptable use level.

b. Radioactive waste must be classified and segregated into the following classes:

(1) Tritium containing material in which the tritium may be released to the environment.

(2) Short half-life materials (half-life of 24 hours or less).

(3) Animal carcasses and/or animal waste.

(4) Dry solid waste (empty vials, absorbent pads, etc.)

(5) Liquid waste.

APPENDIX J - continued

(6) Liquid scintillation vials.

c. Procedures to be followed by users of radioactive material include:

(1) Segregation of radioactive waste into the above categories.

(2) Limit the nonradioactive waste which is mixed with radioactive waste to as little as possible.

(3) Dry solid waste shall be placed in plastic bags or receptacles lined with plastic bags. When filled, the bag will be sealed with radioactive-label tape and marked according to Appendix D, this regulation. If the bags are used for tritium waste, they will be placed inside a kraft paper bag.

(4) Liquid waste and liquid scintillation vials that are retained for disposal shall be sealed and disposed of as directed by the RPO.

(5) All radioactive waste containers shall be properly marked with radiation caution symbols and the words:

"CAUTION - RADIOACTIVE WASTE"

and/or

"CAUTION - RADIOACTIVE MATERIAL"

(6) The inventory of radioactive waste in the possession of individual users will be kept to as little as practical.

(7) Radioactive waste will be controlled by the user to prevent unauthorized disposal by the custodial service.

(8) Animal carcasses will be packed in two plastic bags and kept frozen awaiting proper disposal.

d. Disposal of Radioactive Waste:

(1) Radioactive waste will be controlled and disposed of by the user as instructed by the Radiation Protection Officer.

(2) Excreta from patients undergoing medical diagnosis or therapy with radiopharmaceuticals will be disposed of as directed by the Radiation Protection Officer in accordance with US Nuclear Regulatory Commission (USNRC) regulations and USNRC License requirements.

(3) Radioactive material will not be incinerated or buried at WBAMC.

(4) Individual users are not allowed to dispose of radioactive waste via

APPENDIX J - continued

laboratory sinks which dump into the sanitary sewage system, except as specifically designated by the Radiation Protection Officer.

(5) Ultimate disposal of radioactive waste will be accomplished by the Radiation Protection Officer in accordance with 10 CFR Part 20.

APPENDIX K

LEAK TESTING SEALED SOURCES

1. PURPOSE. To delineate responsibilities for leak testing of sealed sources of radioactive material at WBAMC.

2. DEFINITIONS.

a. Sealed sources, for the purpose of this Appendix, are those which meet all the following criteria:

(1) Radioactive material, other than tritium.

(2) Half-life greater than thirty (30) days.

(3) In any physical form other than gas.

(4) In a quantity which is greater than 100 microcuries of beta and/or gamma-emitting material or greater than 10 microcuries of alpha-emitting material.

(5) Enclosed in, and is intended to be used in, a durable container which prevents leakage or escape of the radioactive material or any of its daughter products.

b. Leak Test -- A nondestructive test in which a wipe is taken from the surface of a sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored where traces of contamination might be expected. Leak tests may be taken by a variety of techniques depending on the source, the isotope, the method of analysis, the mounting, etc.

3. RESPONSIBILITY. The Radiation Protection Officer is responsible for performance, analysis, and posting of records of all leak tests performed at WBAMC to satisfy the requirements of AR 385-11, USNRC License conditions, and DA Authorizations for use of radioisotopes.

4. CRITERIA FOR LEAK TESTING.

a. Leak tests, when required, will be performed at intervals not to exceed six months, except that each source of alpha-emitting radioisotope will be accomplished at intervals not to exceed three months.

b. If a source requiring leak testing is supplied with a certificate from the vendor indicating that a leak test has been made within six months (three months for alpha-emitting sources), an initial leak test will be made on receipt and the retest frequency will be established.

c. Upon receipt of any sealed source a leak test will be performed to verify its condition. Any sealed source which a leak test indicates has greater than .005 microcuries removable radioactivity will be removed from use and reported as required.

APPENDIX L

SURVEY OF WORKING AREAS

1. PURPOSE. The purpose of this Appendix is to delineate the responsibilities for survey of the working areas where radioactive materials are used.

2. RESPONSIBILITIES.

a. Health Physics personnel will perform radiation protection surveys in each area utilizing licensed radioactive materials at a frequency commensurate with the nature, quantity, and hazard potential of the material used. A written report of deficiencies, if found, and corrective action required will be provided to the Principal User.

b. Each Principal User is responsible for radiological safety within his work area. The Principal User will ensure necessary monitoring, survey and evaluations are accomplished as routine procedures to ensure that unwarranted radiological hazards are eliminated.

c. The Radiation Protection Officer will provide additional coverage to users of radioactive materials, radiation producing devices, lasers, and microwave generators consistent with their requirements and will, upon request, perform additional studies and evaluations.

3. AREAS OF INTEREST. Radiological protection surveys will include evaluations of the following, as appropriate:

a. Surface contamination, both removable and fixed.

b. Dose-rate measurements.

c. Airborne radiological hazard, both particulate and gaseous.

d. Ventilation, including fume hoods.

e. Storage areas for radioactive materials.

f. Radioactive waste management, including radioactive waste disposal sinks.

g. Fire and safety hazards.

h. Radiation safety and contamination control aspects of the working environment and experimental procedures.

i. The familiarity of personnel with radiological safety and emergency procedures.

APPENDIX M

MACHINE-PRODUCED RADIATION

1. GENERAL. All machines and devices which produce x-ray, laser or microwave/RF radiation will be registered with the Radiation Protection Officer, who will maintain a registry of such devices in accordance with applicable directives.

2. APPLICABILITY. All proposed procurements, installations, modifications to installations, and relocations of x-ray, laser, and microwave/RF devices will be coordinated with Health Physics. An evaluation will be made of the planned use of the equipment, its location, and protective barriers, interlocks, etc., prior to final approval and commitment of funds.

3. DESIGN REFERENCES. Design or modification of installations shall be accomplished in accordance with:

a. For X-ray: TB MED 521, Management and Control of Diagnostic X-ray, Therapeutic X-ray, and Gamma-Beam Equipment; and the recommendations given in NCRP Reports 33, 35, 36, 49, and NBS Handbook 114, General Safety Standard for Installations Using Non-Medical X-ray and Sealed Gamma Ray Sources, Energies Up to 10 MEV.

b. For Laser: TB MED 524, Control of Hazards to Health From Laser Radiation, and AR 40-46, Control of Health Hazards From Lasers and Other High Intensity Optical Sources.

c. For Microwaves/RF: TB MED 523, Control of Hazards to Health From Microwave and Radio Frequency Radiation and Ultrasound, and AR 40-583, Control of Potential Hazards to Health From Microwave and Radio Frequency Radiation.

d. For Accelerators: NCRP Report No. 51, Radiation Protection Design Guidelines for 0.1-100 MeV Particle Accelerator Facilities.

4. RESPONSIBILITIES.

a. Persons having responsibility for these radiation sources will notify the Radiation Protection Officer of their receipt prior to use.

b. The Radiation Protection Officer will conduct a radiation protection survey of all new, modified, or repaired x-ray, laser or microwave/RF installations prior to their routine use. A radiation protection survey is defined as the evaluation of the radiation hazard in and around an installation. It customarily includes a physical survey of the arrangement and use of the equipment and measurements of the exposure rates under expected operating conditions. A full radiation protection survey is not required after repairs providing output, alignment, shielding, or safety features of the unit have not been altered during repair.

c. The Radiation Protection Officer will conduct a radiation protection survey of existing installations upon request, or at his discretion, to ascertain that equipment, structural shielding, safety devices, and operating procedures are in accordance with pertinent directives, standards, and guides. A written report of the results of the survey will be furnished to the person responsible for the installation.

d. Whenever an x-ray, laser, or microwave/RF device or its installation is found to exceed the limits of the appropriate safety standard, or is otherwise potentially hazardous to personnel, the Radiation Protection Officer will recommend suitable corrective action, and determine if the equipment can continue to be operated pending repairs, modification, etc., without jeopardizing the health of patients and/or occupationally exposed personnel. The responsible individual will be advised, in writing, of these recommendations so that appropriate action may be taken.

e. It is the responsibility of the person in charge of the installation to assure that all equipment under his jurisdiction is operated by persons competent in its safe use. The person in charge will develop a Standing Operating Procedure governing the use of the equipment and post it permanently to insure compliance with SOP.

f. The person in charge of the installation is responsible for the proper education of personnel in safe operating procedures and the nature of injuries resulting from overexposure. Instructions will include information about risks to fetuses from exposure to ionizing radiation. Rules should be promulgated for working safety, including any restriction in operating techniques, to assure safe utilization of equipment.

g. All persons entering x-ray, laser, or microwave areas shall comply with all safety instructions which concern or effect their conduct and shall use such safety devices as are furnished for their protection.

5. CRITERIA.

a. X-ray protection surveys will be conducted in accordance with:

(1) TB MED 521, Management and Control of Diagnostic X-ray, Therapeutic X-ray, and Gamma-Beam Equipment.

(2) NCRP Report No. 33, Medical X-ray and Gamma-Ray Protection for Energies Up to 10 MeV - Equipment Design and Use.

(3) NCRP Report No. 35, Dental X-ray Protection.

(4) NCRP Report No. 36, Radiation Protection in Veterinary Medicine.

APPENDIX M - continued

(5) NCRP Report No. 49, Structural Shielding Design and Evaluation for Medical Use of X-rays and Gamma-Rays of Energies Up to 10 MeV.

(6) NBS Handbook 114, General Safety Standard for Installations Using Non-Medical X-ray and Sealed Gamma Ray Sources, Energies Up to 10 MeV.

b. Laser protection surveys will be conducted in accordance with TB Med 524, Control of Hazards to Health From Laser Radiation, and AR 40-46, Control of Health Hazards From Lasers and Other High Intensity Optical Sources.

c. Microwave/RF protection surveys will be conducted in accordance with TB MED 523, Control of Hazards to Health from Microwave and Radio Frequency Radiation and Ultrasound, and AR 40-583, Control of Potential Hazards to Health From Microwave and Radio Frequency Radiation.

3 Annexes
1. Gen Safety - Laser Opns
2. Gen Safety - Microwave Ovens
3. Gen Safety - RF/Shortwave Diathermy Units

ANNEX 1. (GENERAL SAFETY PRECAUTIONS FOR LASER OPERATIONS) to APPENDIX M (MACHINE-PRODUCED RADIATION)

1. PURPOSE. To provide guidelines for the safe operation of laser devices at William Beaumont Army Medical Center.

2. GENERAL. The effects of laser radiation are essentially the same as light generated by more conventional ultraviolet, infrared, and visible light sources. The unique biological implications attributed to laser radiation are generally those resulting from the very high intensities and monochromaticity of laser light. The principal biological hazards are to the eyes and, to a lesser degree, to the skin. Susceptibility to injury and the severity of injury are dependent upon various properties and the power density of the laser light.

3. HAZARD EVALUATION.

a. General Procedure. Three aspects of a laser application influence the total hazard evaluation and thereby influence the application of control measures.

(1) The capability of the laser device of injuring personnel.

(2) The environment in which the laser is used.

(3) The personnel who may be exposed. A practical means for both evaluation and control of laser radiation hazards is to first classify laser devices according to their relative hazards and then to specify appropriate controls for each classification. The use of the classification method will in most cases preclude any requirements for laser measurements and greatly reduce the need for calculation. This standardized laser classification scheme defines Aspect 1 - the potential hazard of the laser device. Aspects 2 and 3 vary with each laser application scheme. The total hazard evaluation procedure must consider all three aspects, although in most cases only Aspect 1 influences the control measures that are applicable.

b. Laser and Laser System Hazard Classification Schemes.

(1) The general classification scheme with general hazard control concepts is as follows:

(a) Class I - Exempt (EL) laser devices are those not capable of emitting hazardous laser radiation under any operating or viewing conditions.

(b) Class II - Low Power (LP) laser devices are those Continuous Wave (CW) visible (400 - 700 NM) laser devices having a total power between 0.4 uW and 1 mW. Precautions are required only to prevent continuous staring into the direct beam; momentary (0.25 sec) exposure as would occur in an unintentional viewing situation is not considered hazardous.

(c) Class III - Medium Power (MP) laser devices are potentially hazardous if the direct beam is viewed by the unprotected eye, but do not (unless focused) cause hazardous diffuse reflections. Care is required to prevent intrabeam viewing and control specular reflections. Most military laser rangefinders and designators fall into this category.

(d) Class IV - High Power (HP) lasers are those pulsed visible lasers capable of producing hazardous diffuse reflections or fire and skin hazards, or those CW lasers with an output greater than 0.5W. Safety precautions associated with high power lasers generally consist of using door interlocks to prevent exposure to unauthorized or transient personnel entering the laser facility, the use of baffles to terminate the primary and secondary beams, and the wearing of protective eyewear and clothing by personnel.

(2) This classification scheme is taken from American National Standards Institute, ANSI Z 136.1, "Safe Use of Lasers." This classification may already appear on commercial laser products manufactured subsequent to the adoption of that standard and should be used unless the laser is modified to significantly change its output power or energy, or unless the laser is enclosed.

4. SAFEGUARDS AND LIMITATIONS.

a. Medical examinations will be performed on personnel who work with lasers in accordance with Appendix F, this regulation.

b. Visitors to a laser installation who are adequately protected from the laser beam by laser goggles or other suitable means need not be included in the medical surveillance program.

c. Significant or unexplained changes in the ocular examination will be reported to the Radiation Protection Officer, WBAMC, for investigation in coordination with the Ophthalmology Service, WBAMC.

d. Any individual having or suspected of involvement in an accidental laser beam will report the occurrence to the Radiation Protection Officer ASAP, (telephone: 568-5525).

e. Signs warning of hazardous laser radiation will be posted at all entrances to such areas.

f. Only trained personnel in the safe operation of lasers will operate laser devices.

g. Sections using laser devices will have Standing Operating Procedures (SOP's) for each type of laser used within the section. The SOP's will be approved by the Radiation Protection Officer (RPO).

h. Laser installations will be inspected annually by the RPO.

ANNEX 2. (GENERAL SAFETY PRECAUTIONS FOR MICROWAVE OVENS) to APPENDIX M (MACHINE-PRODUCED RADIATION)

1. PURPOSE. To provide guidance for the safe operation of microwave oven devices at WBAMC.

2. GENERAL. The electromagnetic radiation of microwave ovens does not possess sufficient energy to produce ionization. However, it can cause excitation of atoms with the resultant production of heat. When heat is delivered to a tissue in such a way it cannot compensate for and dissipate the heat, damage to the tissue can occur. The actual injury is dependent upon the amount of energy delivered, the rate of energy delivered, and the sensitivity of the tissue. These safety precautions are designed to minimize the possibility of unnecessary or accidental exposure to microwave radiation.

3. PRECAUTIONS FOR SAFE USE OF MICROWAVE OVENS.

a. Microwave ovens will not be operated when empty.

b. Loose or damaged doors or seals will be reported to Preventive Medicine Activity immediately (568-4328).

c. Metal objects will not be placed in microwave ovens.

d. Close and latch the oven door completely, but do not slam the door.

e. Never operate the oven with the door partially open; if the oven will operate with door open, report it immediately to Preventive Medicine Activity (568-4328).

f. Report any malfunction of the oven to supervisory personnel.

4. INSPECTIONS. Microwave ovens will be inspected by Preventive Medicine personnel for leakage as follows:

a. Routine -- All ovens will be inspected for leakage at least every 6 months.

b. Special -- All ovens will be inspected for leakage prior to being placed in service or whenever repaired ovens are returned for service.

5. LEAKAGE. Any microwave oven having leakage of 5 mW/cm^2 or greater at a distance of 5cm or more will immediately be removed from service, cleaned, repaired and reinspected prior to service.

ANNEX 3 (GENERAL SAFETY PRECAUTIONS FOR OPERATION OF RADIOFREQUENCY/SHORTWAVE DIATHERMY UNITS) to APPENDIX M (MACHINE-PRODUCED RADIATION)

1. PURPOSE. To provide guidance for the safe operation of radio frequency (RF) Shortwave diathermy units at WBAMC.

2. GENERAL. While the purpose of such equipment is to generate and supply energy for conversion to heat in the treatment of patients, care should be taken not to treat unnecessary areas of the body or other individuals. These safety precautions are designed to minimize the possibility of unnecessary or accidental exposure to the radiation from diathermy units.

3. PRECAUTIONS FOR SAFE USE OF DIATHERMY UNITS.

a. Calibrate the diathermy units in accordance with the manufacturer's guidelines.

b. All applications of RF/shortwave radiation to personnel should be performed only at the request of the attending physician or physical therapist.

c. The suggested percentage of power setting should be maintained.

d. The duration and areas of exposure, as outlined by the physician or physical therapist, should not be exceeded and should be administered by qualified personnel only.

e. All applications in the head area should be avoided and other types of treatment substituted.

f. The diathermy unit should be secured when not in use.

g. The power setting control should be checked prior to operation to determine any looseness in the control knob position.

h. The timing mechanism should be checked prior to each application to ascertain that the unit does cut off at the end of the preset time of exposure.

i. Do not treat patients on objects which are grounded or use beds, couches, tables, or chairs with steel springs or innerspring mattresses, because sufficient heat may be generated to ignite the mattress material.

j. The applicator(s) should be placed as recommended by the manufacturer's manual, being certain that the position will not change during application so that the power loading will remain constant.

k. RF/Shortwave diathermy is contraindicated for patients with metal implants.

l. Ensure that pacemaker patients are not in the vicinity of the unit.

m. Post pacemaker warning signs as specified in TB MED 523 only while the RF diathermy equipment is in operation.

APPENDIX N

HEALTH PHYSICS ASPECTS OF PATIENT CARE

1. RESPONSIBILITIES.

a. The Radiation Protection Officer, WBAMC, is responsible for providing Health Physics support for WBAMC.

b. The Commander, WBAMC, provides such guidelines as are necessary to insure adequate protection for medical personnel involved in patient care who are occupationally exposed to ionizing radiation.

2. SPECIFIC REQUIREMENTS.

a. Individuals who are occupationally exposed to radiation from radioisotopes or x-ray producing devices will wear film badges unless specifically exempted by the Radiation Protection Officer.

b. Personnel, equipment, linen and facilities will be monitored for radioactive contamination following any procedure in which the possibility of contamination exists.

c. Dressings, etc., destined for disposal will be monitored and disposed of as radioactive waste as required.

d. Health Physics personnel are expected to make recommendations to minimize the accumulated dose to medical personnel and patients who are not being treated with radiation.

e. Patients will not normally be discharged from the hospital following inpatient radioisotope therapy with gamma-emitting radioisotopes until the criteria of the "No Restrictions" column of Table 4, NCRP Report No. 37 are satisfied. The Radiation Protection Officer will make recommendations to the responsible physician regarding any exceptions to this policy.

f. Guidance on various areas of patient care are described below:

(1) Health Physics Aspects of Nursing Care of Radiation Therapy Patients with Sealed Sources (see Annex 1, this Appendix).

(2) Health Physics Aspects of Nursing Care of Radiation Therapy Patients with Non-Sealed Sources (see Annex 2, this Appendix).

(3) Death -- Health Physics Procedures (see Annex 3, this Appendix).

(4) Health Physics Aspects of Surgery and Autopsy (see Annex 4, this Appendix).

APPENDIX N - continued

(5) Health Physics Aspects in the Therapeutic Administration of Radioactive Material (see Annex 5, this Appendix).

(6) Management of Radioactive and Contaminated Patients (see Appendix O, this regulation).

5 Annexes
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ANNEX 1. (HEALTH PHYSICS ASPECTS OF NURSING CARE OF RADIATION THERAPY PATIENTS WITH "SEALED" SOURCES) to APPENDIX N (HEALTH PHYSICS ASPECTS OF PATIENT CARE)

1. PURPOSE. The purpose of this Annex is to familiarize nursing staff with their responsibilities to the patient and themselves in the prevention of unnecessary exposure to radiation.

2. GENERAL.

a. This type of radioactive source (Sealed Source) is encapsulated in a metal tube which is then sealed and therefore is classified as a "Sealed Source." Once this source has been removed from the patient, there is no longer a source of radiation in the patient. Normally, there is no contamination on the linen, utensils, etc. Patients undergoing external beam therapy (e.g., cobalt-60, orthovoltage x-ray) in the Radiation Therapy Clinic are not radioactive and therefore are not discussed in this ANNEX.

b. If any of the following should occur, immediately notify the Radiation Protection Officer (568-5525) and the physician who administered the radioactive material:

(1) Major surgery

(2) Transfer of the patient

(3) Death of the patient

3. SPECIFIC GUIDANCE.

a. Whenever possible, place the patient in a private room with the bed near the outside wall. If it is necessary, two radiation therapy patients may be placed in the same room. A nonradiation therapy patient should not be in the same room with a radiation therapy patient.

b. Consistent with adequate care for the patient, carry out only minimal nursing procedures close to the patient. If the patient's clinical status requires constant observation, rotate personnel required to perform adequate nursing care in order to minimize radiation exposure to the hospital personnel. The patient's bed should be approached only when required by nursing duties.

c. When required by the Radiation Protection Officer, hospital personnel must wear a film badge or other specified dosimetry device when entering the patient's room. A film badge will be worn only by the individual to whom it is assigned and will not be interchanged between individuals. Film badges may be obtained by calling the Radiation Protection Officer (568-5525).

d. Personnel are not to remain in the room unless engaged in a specific activity. Custodial, utility, maintenance, and food service workers should not enter the room unless they receive permission and instructions from the Ward Nurse.

e. Patients undergoing radiation therapy with internal sealed sources must remain in bed unless orders are written to the contrary. Under no circumstances will they be permitted to leave the hospital until therapy is terminated.

f. Suspected or confirmed pregnant nursing personnel will not be assigned to the care of radiation therapy patients.

g. Excreta, linens, and other equipment may be handled in the usual manner.

h. Special handling of food tray is not required.

i. In event of a suspected loss or dislodgement of the sealed source:

(1) Notify the physician who administered the source.

(2) Notify the Radiation Protection Officer (568-5525). After normal duty hours, the RPO may be reached through the Administrative Officer of the Day (AOD).

(3) Do not remove any container or linen from the room, flush the toilet, or use the sink.

(4) The radioactive source must be handled only with forceps, never picked up by hand. The source may be placed in a bed pan in the corner of the room and the bed pan filled with water.

j. Health Physics personnel will monitor the patient area and will indicate a "safe distance" line for visitors.

k. If the patient should die:

(1) Notify the physician who administered the source. The source will be removed before the body is taken to the morgue.

(2) Notify the Radiation Protection Officer (568-5525).

l. Emergency Surgery:

(1) Notify the physician who administered the source. The source will be removed for surgery.

(2) Notify the Radiation Protection Officer (568-5525).

m. The patient may have visitors. If the patient does have visitors:

Annex 1, Appendix N - continued

(1) Visitors should NOT be permitted to stay with the patient longer than specified by the Radiation Protection Officer. Health Physics personnel will monitor the patient area and will indicate a "safe distance" line for visitors. Except for the initial greeting, visitors should not stay closer to the patient than this line.

(2) Visitors who are under 18 years of age, or who are/or may be pregnant, will not be permitted into the room. They may, however, stand in the doorway for a short period of time.

(3) Visitors are limited to family members.

n. Exceptions to any Health Physics aspects may be made by the Radiation Protection Officer on a case to case basis.

ANNEX 2. (HEALTH PHYSICS ASPECTS OF NURSING CARE OF RADIATION THERAPY PATIENTS WITH "NON-SEALED" SOURCES) to APPENDIX N (HEALTH PHYSICS ASPECTS OF PATIENT CARE)

1. PURPOSE. The purpose of this Annex is to familiarize the nursing staff with their responsibility to the patient and themselves in the prevention of unnecessary exposure to radiation.

2. GENERAL.

a. This type of radioactive source (non-Sealed Source) is usually administered in liquid form and therefore is classified as a non-sealed source. The source material will remain in the patient until it decays and/or is excreted; therefore, contamination of linen, etc., is possible.

b. Immediately notify the Radiation Protection Officer (568-5525) and the physician who administered the radioactive material if any of the following occurs:

(1) Major surgery

(2) Transfer of the patient

(3) Death of the patient

3. SPECIFIC GUIDANCE.

a. Whenever possible, place the patient in a private room with the bed near the outside wall of the room. When necessary, two radiation therapy patients may be placed in the same room. A nonradiation therapy patient should not be in the same room with a radiation therapy patient.

b. Consistent with adequate care for the patient, carry out only minimal nursing procedures close to the patient. If the patient's clinical status requires constant observation, rotate personnel required to perform adequate nursing care with minimum personnel exposure. The patient's bed should be approached only for required nursing duties.

c. A film badge or other dosimetric device specified by the Radiation Protection Officer must be worn when entering the room. A film badge will be worn only by the individual to whom it is assigned. Nursing personnel will leave their film badges at the Nursing Station at the end of their shift. Call the Radiation Protection Officer to get film badges (568-5525).

d. Personnel are not to remain in the room unless engaged in specific activity. Custodial, utility, maintenance, and food service personnel should not enter the room unless they receive permission and instructions from the Ward Nurse.

e. Patients undergoing radiation therapy with non-sealed sources will remain in the assigned room. The patient will not be permitted to leave the hospital until authorized by the attending physician and the Radiation Protection Officer.

f. Suspected or confirmed pregnant nursing personnel will not be assigned to the care of radiation therapy patients.

g. The patient's food tray will be prepared entirely with disposable components. The tray will be disposed of as waste within the patient's room. Uneaten food will not be given to others. These components will be handled with gloves and packaged in plastic bags to be retained as waste.

h. Health Physics personnel will monitor the patient area and will indicate a "safe distance" line for visitors. Emergency after hours telephone numbers for Health Physics personnel are available from the Administrative Officer of the Day (AOD).

i. Necessary contamination control measures are very similar to isolation techniques:

(1) All direct nursing care of the patient should be performed wearing gloves. The gloves should be disposed of in a waste container. After leaving the room, nursing personnel should thoroughly wash their hands.

(2) Cover the mattress and pillow of the bed with plastic or rubber material.

(3) Gloves will be worn when changing bed linen, dressings, etc. The gloves should be disposed of in the waste container in the room.

(4) The patient will wear hospital pajamas.

(5) Place plastic-lined wastebasket and linen hamper in the patient's room.

(6) Place waste, soiled linen, etc., in the designated containers for monitoring and disposal as directed by Health Physics personnel.

(7) Personal items for patient care (thermometer, bedpan, etc.) will be kept in the patient's room.

j. Ambulatory patients will use the commode in their room. It should be flushed twice after using.

k. Diagnostic samples of blood, urine, and feces should be obtained after the Radiotherapist or Nuclear Medicine Physician authorization is obtained.

Annex 2, Appendix N - Continued

l. If a patient is incontinent, an indwelling catheter must be used during the first 48 hours and emptied frequently.

m. If the patient is ambulatory, he may take tub baths or showers (if not contraindicated) in the bath of his room. The tub and shower should be well rinsed afterwards.

n. Should the patient become nauseated and vomit or accidentally spill a container of his urine, mark off the area immediately, cover it with absorbent material being careful not to spread the contamination or become contaminated. Call the Radiation Protection Officer (568-5525), and ensure no personnel enter the contaminated area. Remove any clothing that has become contaminated and scrub skin that may have been contaminated. Do not attempt to touch anything in the contaminated area without wearing protective gloves and gown.

o. Call the Hospital Engineer and the Radiation Protection Officer for correction of plumbing. Blocked drains may be a radiation hazard. The Radiation Protection Officer will assess the potential hazard prior to the plumbers initiating work.

p. If the patient dies, notify the physician who administered the source and the Radiation Protection Officer. The body will not be removed from the ward until a Health Physicist advises on the appropriate protective measures for transport of the remains.

q. The room will not be returned to general use (i.e., another patient placed in the room) until cleared by the Radiation Protection Officer. Visitors will not be permitted unless specifically authorized by the Radiation Protection Officer.

r. Any personal items of patient will be monitored at time of release.

s. Emergency Surgery:

(1) Notify attending therapy physician.

(2) Notify Radiation Protection Officer (568-5525).

(3) Notify Operating Room Supervisor of patient's condition.

ANNEX 3. (DEATH -- HEALTH PHYSICS ASPECTS) to APPENDIX N (HEALTH PHYSICS ASPECTS OF PATIENT CARE)

1. APPLICABILITY. This Annex applies to the management of remains of patients who have been undergoing radiation therapy with radioisotopes.

2. RADIOACTIVE TEMPORARY IMPLANTS AND APPLICATIONS. When the patient has been treated with a radioactive temporary implant and application, the procedures outlined below will be followed:

a. Notify the Radiotherapist who administered the temporary implant and applications. The implant will be removed before the remains are taken to the morgue.

b. Notify the Radiation Protection Officer (568-5525) and request special instructions in management and transportation of the remains and return of the room to general use.

c. After the radioactive temporary implant and applicator have been removed from the body, the remains may be handled in the routine manner.

d. If the radioactive temporary implant and applicator cannot be removed from the body, process the remains as outlined in paragraph 3, below.

3. UNSEALED RADIOISOTOPES AND PERMANENT IMPLANTS. When the patient has been receiving radiation therapy using unsealed radioactive material (or permanent implants), the procedure outlined below will be followed:

a. Notify the physician who administered the radioactive material.

b. Notify the Radiation Protection Officer (568-5525). Health Physics personnel will report to the ward to assist in:

(1) Management of the remains.

(2) Transportation of the remains to the morgue.

(3) Survey of the room, personal effects, linen, etc.

(4) Removal of any radioactive waste or items for disposal or decontamination, as appropriate.

(5) Removal of protective markings and signs from the patient's room.

4. ADMINISTRATIVE REQUIREMENTS. To ensure the prompt identification of radioactive remains and to facilitate the minimizing of radiation exposure of the staff, the following administrative procedures will be followed:

a. The "CAUTION - RADIOACTIVE MATERIALS" label affixed to the chart will remain until all radioactive material is removed from the body.

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b. A tag bearing the radiation warning symbol and the words:

"CAUTION - RADIOACTIVE MATERIALS: This patient's body contains a significant quantity of radioactive material as specified in Chapter 3, NCRP Report No. 37."

will be attached to the body in the same manner as the tag contained in the mortuary pack.

c. A similar tag or label will be attached to the outside of the shroud by the Radiation Protection Officer.

d. If the body contains residual quantities of radioactive material, the Radiation Protection Officer or his representative will complete and sign the following statements in accordance with Appendix V, NRCP Report Number 37. This statement will be attached to the Death Certificate for transmittal to the Funeral Director by the Registrar, WBAMC.

(1) Report on Radioactivity

TO: Funeral Director

FROM: Radiation Protection Officer
William Beaumont Army Medical Center
El Paso, Texas 79920-5001

This body contains no significant amounts of radioactive material. No special precautions are required for standard embalming procedures.

Radiation Protection Officer, WBAMC
Date: _____

(2) Report on Radioactivity

TO: Funeral Director

FROM: Radiation Protection Officer
William Beaumont Army Medical Center
El Paso, Texas 79920-5001

This body contains a significant amount of radioactive material. The following special precautions are recommended: (insert recommendations)

Radiation Protection Officer, WBAMC
Date: _____

ANNEX 4. (HEALTH PHYSICS ASPECTS OF SURGERY AND AUTOPSY) to APPENDIX N. (HEALTH PHYSICS ASPECTS OF PATIENT CARE)

1. GENERAL.

a. The Radiation Protection Officer will provide direct support (consisting of at least one Health Physicist) to surgery and autopsy on patients whose bodies contain or will be implanted with radioisotopes.

b. The principal guidance for surgeons, pathologists, and funeral directors on this subject are contained in NCRP Report No. 37, Precautions in the Management of Patients Who Have Received Therapeutic Amounts of Radionuclides. A copy of NCRP Report No. 37 will be provided by the Radiation Protection Officer on request.

c. Health Physics support and/or advice regarding radiation protection during surgery or autopsy may be obtained by calling:

DUTY HOURS: 568-5525

AFTER DUTY HOURS: Call the AOD for telephone number of the Radiation Protection Officer.

2. SPECIAL REQUIREMENTS.

a. Prior to the surgery (autopsy) the physician who administered the radioactive material should meet with the assigned surgeon (pathologist) and the Radiation Protection Officer. The probable residual quantity of radioactive material within the body will be evaluated. The Health Physics aspects of the surgery (autopsy) procedure will be estimated.

b. If the anticipated exposure to the surgeon (prosector) and his assistants is considered prohibitive, it may be necessary to delay the procedure to allow for decay of the radioactive material in the body, or rotate the personnel performing the procedure to preclude overexposure.

c. Personnel engaged in and supporting surgery (autopsy) will wear film badges if the patient contains radioisotopes, unless exempted by the Radiation Protection Officer.

d. Personnel, equipment, linen and facilities will be monitored for radioactive contamination following the procedure when the possibility of contamination exists.

e. Tissues, dressings, etc., destined for disposal will be monitored and disposed of as radioactive waste, when warranted.

f. Health Physics personnel are expected to make recommendations to minimize the accumulated dose to the surgeon (Pathologist) and other members of the team.

g. Autopsy:

(1) At the completion of the autopsy, the physician who administered the radioactive material will inform the Radiation Protection Officer of the probable residual quantity of radioactive material within the body, based on body fluids, tissues, and organs which were removed.

(2) The Radiation Protection Officer will review the statement which has been executed for delivery to the Funeral Director to determine if the warning is still applicable.

h. All surgery and autopsy teams will be monitored by Health Physics personnel after completion of surgery/autopsy.

ANNEX 5. (HEALTH PHYSICS ASPECTS IN THE THERAPEUTIC ADMINISTRATION OF RADIOACTIVE MATERIAL) to APPENDIX N (HEALTH PHYSICS ASPECTS OF PATIENT CARE)

1. PURPOSE. The purpose of this Annex is to specify the duties of Health Physics personnel in the prevention of unwarranted exposure to nursing personnel, visitors, and those who occupy areas adjacent to the patient being treated.

2. NOTIFICATION OF THERAPEUTIC ADMINISTRATION.

a. Sealed Sources. The Radiotherapist will notify the Radiation Protection Officer when he schedules a patient for a sealed source implant. The type and quantity of sealed sources, the applicator to be used and its loading arrangment, the patient's name, date of use, and ward number will be recorded.

b. Non-Sealed Sources. Nuclear Medicine Service will notify the Radiation Protection Officer of a scheduled therapeutic administration of radioactive material which requires patient hospitalization.

c. Notification of Ward Nurse.

(1) The physician scheduling a patient for radiation therapy will notify the appropriate Ward Nurse of the proposed administration of radioactive material.

(2) Health Physics personnel will obtain from the nurse the names and social security numbers of those persons who will be caring for the therapy patient and will issue film badges to any personnel not assigned a film badge as appropriate.

3. PREPARATION OF RADIOACTIVE MATERIAL.

a. Sealed Sources. Health Physics personnel should ensure that the Radiation Therapy technicians divide the workload between them in order to keep their exposure to a minimum.

b. Non-Sealed Sources. Health Physics personnel have no specific duties that relate to the preparation of non-sealed sources.

4. SEALED SOURCE ADMINISTRATION.

a. The Radiotherapist is responsible for the safe handling of the radioactive material from the time it leaves Radiation Therapy until he returns it.

b. The Radiation Protection Officer (568-5525) will provide a Health Physicist for assistance upon request. A Health Physicist will normally be in attendance during the transportation and application of radioactive material.

c. The Radiation Protection Officer will conduct a radiation protection survey of the patient's room and adjacent areas following initial administration of the radioactive material and following any modification in the loading.

5. NON-SEALED SOURCE ADMINISTRATION.

a. The physician treating the patient is responsible for insuring safe delivery of the radioactive material to the ward, and for obtaining sufficient absorbent paper and other protective equipment as indicated by the type of radioactive material.

b. Health Physics personnel will normally be in attendance during transportation and therapeutic administration of unsealed radioactive material.

c. Health Physics personnel will:

(1) Ascertain that the protective materials are used to provide maximum protection of medical personnel.

(2) Remain available during the administration for assistance.

d. Following administration, Health Physics personnel will:

(1) Monitor the administering staff and their equipment.

(2) Ensure that radioactive laundry and waste containers are in the patient's room and are properly labeled.

(3) Instruct the patient in procedures for preventing the spread of contamination, employing a manner which will obtain the desired results without alarming the patient.

6. PATIENT CARE ON THE WARD.

a. When the therapeutic application is performed at a location other than the patient's room, Health Physics personnel will go to the ward as soon as practicable after the patient arrives.

b. Health Physics personnel will:

(1) Ascertain that the patient's bed is placed in a position that will reduce any unnecessary exposure of adjacent areas.

(2) Mark on the floor a "safe distance" line (not to exceed 5 mR/hr).

(3) Advise the patient of the potential hazard to visitors who spend too much time in the room. He will take care not to alarm the patient and will

emphasize that the treatment has been prescribed for the patient and not the visitors.

(4) Prepare an information packet to be posted near the doorway to the patient's room. This packet will consist of:

(a) A "CAUTION - RADIATION AREA" sign.

(b) A copy of "Health Physics Aspects of Nursing Care of Radiation Therapy Patients with Sealed Sources" or a copy of the "Health Physics Aspects of Nursing Care of Radiation Therapy Patients with Nonsealed Sources," as appropriate.

(c) Return to the ward at least once during the treatment to perform a survey of the patient, observe ward health physics and recommend improvements as required.

c. Removal of Protective Markings:

(1) If the patient was treated with a sealed source of radioactive material, all Health Physics restrictions will be removed after the source has been removed.

(2) If the patient was treated with a nonsealed source, all Health Physics restrictions will remain in effect until the exposure rate at one (1) meter indicates a "no restriction" level of activity as defined in Table 4, NCRP Report No. 37.

(a) The administering physician, as well as the ward nurse, should be notified when Health Physics restrictions are removed.

(b) Radioactively contaminated laundry and waste will be removed from the patient's room and the room will be monitored before it is released for normal occupancy.

7. DISCHARGE OF THERAPY PATIENTS.

a. Patients receiving radiotherapy with nonsealed Iodine 131 shall normally remain hospitalized until the residual activity in the body is 8 millicuries or less. Release of patients with greater than 8 mCi activity of Iodine 131 will be approved by the Health Physicist and the Nuclear Medicine physician treating the patient.

b. Patients containing radioactive implants, except permanent implants, shall remain hospitalized until the implant is removed.

c. Radiation therapy patients will remain hospitalized until the residual activity in the body is 30 millicuries or less, unless the Radiation Protection Officer and the responsible physician determine that early release of the

patient is in the best interests of the patient and that early release will not be prejudicial to the safety of members of the patient's household or the general public.

d. Clearances for discharge of the patient may be obtained from the physician who administered the material. He will coordinate with the Radiation Protection Officer.

e. If the patient is returning to a home where there are young children, an evaluation of the potential dose to them should be considered in determining the discharge date.

f. In no event will a patient be discharged if there is sufficient radioactive material remaining in the body to warrant posting of the patient's room with the radiation warning symbol.

APPENDIX O

MANAGEMENT OF RADIOACTIVE AND CONTAMINATED CASUALTIES

1. PURPOSE.

a. To delineate the responsibilities and describe the procedures for management of radioactive and radioactively contaminated casualties.

b. To prescribe control measures to limit the radiation exposure to the staff treating the radioactive or radioactively contaminated casualty.

c. To prescribe control measures to limit the spread of radioactive contamination throughout WBAMC resulting from handling a radioactive or radioactively contaminated casualty.

d. To provide guidance in the management of radioactive or radioactively contaminated casualties.

2. APPLICABILITY. This Appendix is applicable to all individuals and activities at William Beaumont Army Medical Center in the handling of radioactive or radioactively contaminated casualties. Annex L to the WBAMC Emergency Preparedness Plan supersedes this Appendix during expanded medical operations.

3. DEFINITIONS.

a. A radioactive patient is one who is radioactive because of internal deposition of radioactive material or neutron activation of body tissues. If improperly managed, such a casualty could irradiate medical personnel or contaminate personnel, equipment and facilities.

b. A radioactively contaminated patient is an individual who has external contamination on his clothing or body. After removal of radioactive contamination, the individual presents no radiation hazard.

4. GENERAL GUIDANCE.

a. Radioactive patients and contaminated patients will receive all necessary medical care and treatment at the earliest practicable time.

b. Radiation fields and radioactive contamination will not deter medical personnel efforts to save life or limb, although slightly different techniques may be employed (e.g., rotating medical personnel to minimize exposure of any one individual, etc).

c. Radioactively contaminated patients will be decontaminated at the earliest possible opportunity consistent with their medical needs.

d. Every effort will be made to minimize radiation exposure and the spread of contamination during medical treatment.

e. The Radiation Protection Officer will provide personnel to advise on exposure and contamination control at the site of patient treatment. He will not impede patient care, but will recommend ways to minimize exposure and to avoid resource loss to contamination.

f. At the earliest time consistent with the care of the patient, the attending physician will allow decontamination to begin. Decontamination will be undertaken by paramedical personnel under the guidance of Health Physics personnel.

g. All contaminated clothing, equipment and waste materials will be retained by the Health Physics representative.

h. Contaminated valuables will be recorded on the DA Form 3696 (Patient's Deposit Record). These valuables will be retained by Health Physics personnel who will safeguard them and decontaminate the items as time permits. Decontaminated items will be returned to the Hospital Treasurer or patient. In this capacity, Health Physics personnel are functioning as agents of the Hospital Treasurer.

5. RESPONSIBILITIES.

a. The senior medical officer (or senior individual, in the absence of a medical officer) present at the scene of an accident is responsible to:

(1) Apply first aid to the patient.

(2) Evaluate the injury of the patient to determine if immediate evacuation is required.

(3) Evaluate the contamination of the patient, if practicable.

(4) Decontaminate the patient before evacuating if the condition of the patient permits, and if such decontamination can be performed without aggravating the injuries.

(5) Employ contamination control measures.

(6) Arrange, undertake, or direct evacuation of the casualty to the Emergency Room, WBAMC, by the most practical means.

(7) Notify the Emergency Room (569-2209) and the Radiation Protection Officer (568-5525) that a radiation casualty is being evacuated to the Emergency Room.

APPENDIX O - continued

b. The attending physician shall:

(1) Notify Health Physics (568-5525) that a potentially radioactive or radioactively contaminated casualty is enroute and request support.

(2) Undertake treatment of the casualty emphasizing life-saving measures only until the Health Physics team arrives.

(3) Contamination control measures which are appropriate for the Emergency Room are quite similar to isolation techniques employed with a highly contagious patient. The movement of the patient throughout the hospital should be minimized until decontamination procedures can be undertaken or contamination control measures implemented (e.g., have x-rays taken in the Emergency Room, etc.).

(4) Exposure control measures under Emergency Room conditions are essentially as follows:

(a) Employ the fewest medical personnel required to evaluate and treat the patient.

(b) Limit the time individuals spend in the proximity of the casualty to the least consistent with his needs.

(c) Keep all nonessential personnel as far away from the patient as practicable.

(d) If the patient is highly radioactive, or contaminated, rotate or replace staff personnel frequently to limit individual exposure. Keep a record of all personnel who attend the patient including the length of time they were near the patient.

c. The Radiation Protection Officer, WBAMC, is responsible to:

(1) Provide advice and radiation protection equipment to support the care of radioactive or contaminated casualties.

(2) Provide exposure control and monitoring of staff personnel attending the casualty.

(3) Advise, direct or conduct decontamination of the casualty at the earliest time consistent with medical needs of the patient.

(4) Direct contamination control measures to limit the spread of contamination throughout the hospital.

(5) Survey the hospital areas for radioactive contamination.

(6) Advise on decontamination of hospital areas as soon as possible after treatment of the casualty.

(7) Notify the Chairman, Radiation Control Committee (RCC), of the radioactive or radioactively contaminated casualty, as required. The appropriate members may be utilized in recommending medical management, etc.

(8) Notify the Public Affairs Officer (569-2450) promptly of the incident and provide updated information periodically.

(9) Make appropriate reports to The Surgeon General, Nuclear Regulatory Commission, and other agencies in accordance with pertinent directives.

(10) Make prompt investigations of the incidents.

(11) Prepare and submit necessary reports of the incidents.

(12) Issue specific guidance for the management of a radioactive or radioactively contaminated patient to minimize exposure of the staff or the spread of contamination depending on the prevailing situation. Such guidance will be developed on the scene by Health Physics personnel. Adherence to his recommendations is important since radioactive contamination may necessitate expensive decontamination operations which may curtail operations for days.

APPENDIX P

CONTAMINATION CONTROL AND DECONTAMINATION PROCEDURES

1. PURPOSE. To delineate responsibilities relating to contamination control and decontamination procedures at WBAMC.

2. RESPONSIBILITIES.

a. The Radiation Protection Officer is responsible for control of radioactive contamination and supervision of decontamination.

b. Each Principal User is responsible for assisting the Radiation Protection Officer in the accomplishment of his mission by:

(1) Controlling contamination within his area of responsibility.

(2) Reporting all spills, releases, accidents, incidents, or unusual occurrences involving radioactive material promptly, so that contamination control may be initiated.

(3) Providing the resources for decontamination operations.

c. In general, the individual who causes contamination to occur performs the decontamination required. In cases where adequate resources are not available to perform the decontamination, the Radiation Protection Officer will, upon request, coordinate with other activities to secure the needed resources.

3. GENERAL.

a. Air or water that contains radioactive material in excess of the concentrations specified in Appendix B, Table II, Title 10, Code of Federal Regulations Part 20, shall be considered to be contaminated and shall be controlled and disposed of in accordance with the instructions of the Radiation Protection Officer.

b. The contamination limits prescribed by Department of the Army are in Appendix G (Radioactive Contamination Guides), AR 40-37, and Annex 1, this Appendix.

c. Methods of controlling contamination which may be employed to minimize the spread of radioactive contamination include:

(1) Use of personnel protective clothing and devices, such as rubber or plastic gloves, laboratory coats, shoe covers, head covers, face masks, respirators, etc.

(2) Providing and frequently using an exposure rate meter capable of detecting and monitoring contamination from the radioisotopes in use.

(3) Using separate, specially-marked radioactive waste containers.

(4) Limiting traffic and occupancy of work areas where radioactive materials are in use.

(5) Designing and enforcing work flow and procedures to minimize transfers and manipulations of radioactive material.

(6) Conducting procedures which generate radioactive aerosols, dusts, or gaseous products in fume hoods, glove boxes, or other suitable closed systems.

(7) Designating and posting of contaminated and potentially contaminated areas during procedures which are likely to produce contamination.

(8) Covering working surfaces with polyethylene and absorbent disposal material.

(9) Using trays capable of containing a total spill of liquid radioactive material under experiments of this type.

(10) Using double containers for vessels of radioactive materials which are easily upset, e.g., volumetric flasks.

(11) Using polyethylene bags to contain waste and to line waste containers. If tritium is used, an added kraft paper bag will retard the escape of the tritium.

(12) Avoid the use of house vacuum lines for radioactive materials.

(13) Post cabinets, refrigerators, ovens, etc. where radioactive material is used.

(14) Establishing control points outside contaminated areas where personnel will monitor themselves before leaving the area.

(15) Promptly clean up and monitor all spills.

d. Personnel Decontamination.

(1) Individuals with contaminated clothing shall remove their clothing as soon as possible.

(2) Decontamination of the skin is recommended by washing thoroughly with mild soap or detergent and a soft brush. Do not abrade the skin. Do not wash with solvents.

APPENDIX P - continued

(3) Further decontamination of individuals will be under the supervision of the Radiation Protection Officer.

e. Surface decontamination will require protective gloves and in some cases, protective clothing. Decontamination swipes will be disposed of as radioactive waste in accordance with instructions received by the Radiation Protection Officer.

f. Contaminated bed clothing/laundry will be collected by the Health Physics personnel at the site of the contamination and taken for decontamination or disposal.

g. Health Physics personnel will survey all decontaminated individuals, areas, and equipment prior to release to general use.

1 Annex
Permissible Levels of
Radioactive Contamination

Contaminated Items and Indications for Action	Fixed (F) or Removable (R)	Dpm per 100 cm²	Contamination Level: Alpha Dpm per 100 cm²	Contamination Level: Beta-gamma* mrad/hr 2.54 cm	Dpm per 100 cm²	Method of Measurement
1. Clothing, including shoes:						
a. Personal. Should be replaced, decontaminated or stored for decay if above:	F	200		0.2		Probe
	R		None		None	Smear†
b. Anticontamination.						
(1) General. Should be replaced and/or decontaminated, if above:	F	1000		0.2		Probe
	R		200		1000	Smear†
(2) Laundry. Should not be released to public laundry if above	F	200		0.2		Probe
	R		50		200	Smear†
(3) Respirators. Should be decontaminated after use if above:	F	200		1.0‡		Probe
	R		None		None	Smear‡
2. Containers. Prior to nonradioactive use, should be decontaminated if above:	F	200		0.2		Probe
	R		None		100	Smear†
3. Laboratories and Work Areas:						
a. Noncontrolled Area. Require controls and posting or decontamination if above:	F	200		0.2		Probe
	R		20		100	Smear†
b. Controlled Areas:						
(1) Hoods:	F	1000		2.0		
	R		200		2000	Probe
(2) Glove Boxes:	F	5000		2.5		Smear‡
	R		1000		5000	Probe
(3) Workbench Surface:	F	1000		0.5		Smear†
	R		200		1000	Probe
4. Skin:						Smear†
a. Body. Continue decontamination if above:	F	200		0.06		
	R		None		None	Probe
b. Hands. Continue decontamination if above:	F	400		0.1		Smear†
	R		None		None	Probe
5. Vehicles/Radioactive Containers:						Smear†
a. Used in controlled area. Should be decontaminated if above:	F	-§		2.0§		Probe
	R		2200§		22,000§	Smear†
b. Used in noncontrolled area. Should be decontaminated if above:	F	—§		0.5§		Probe
	R		220§		2,200§	Smear†
6. Equipment:						
a. Used in controlled area. Should be decontaminated if above:	F	5000		2.0		Probe
	R		1000		10,000	Smear†
b. Used in noncontrolled area. Should be decontaminated if above:	R	500		0.2		Probe
	F		100		1,000	Smear†

* Measured through not more than 7 milligrams per square centimeter of total absorber and averaged over not more than 1 square meter.
† The amount of removable/transverable radioactive material as determined by wiping/smearing 100 square centimeters with filter or soft absorbent paper, applying moderate pressure and assessing the amount of radioactive material on the wipe/smear with an appropriate instrument with known efficiency.
‡ In contact with any outside surfact of Respirator/Mask.
§ Based on 49 CFR 173.397 or Graziano's Tariff.

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APPENDIX Q

HEALTH PHYSICS ASPECTS OF FIRE FIGHTING

1. PURPOSE. To prescribe general measures to be followed to minimize radiological hazards associated with fire protection.

2. FIRE PREVENTION.

a. Whenever possible, flammable materials will not be stored with radioactive materials. When flammable materials must be stored with radioactive materials, the storage will be coordinated with the WBAMC Fire Marshal to ensure minimum fire hazard.

b. Every effort will be made by the user to eliminate fire hazards within his area.

c. Routine Fire Prevention inspections will locate the areas of radioactive storage by the "CAUTION - RADIOACTIVE MATERIALS" signs posted as required in this regulation.

3. FIRE FIGHTING. Whenever the firemen respond to a call in an area posted "CAUTION - RADIOACTIVE MATERIALS," the following protective measures will be utilized to minimize the radiation hazard:

a. The Radiation Protection Officer (568-5525) will be notified of a fire in a radiation posted area. After normal duty hours, Health Physics personnel will be contacted by the AOD.

b. Health Physics personnel will provide radiation protection recommendations to the fire fighting personnel upon arrival.

c. Personnel assigned in the area should remain close by to provide information as requested.

d. Firemen should wear self-contained breathing apparatus, protective coat and boots.

e. Fire fighters will stay in the posted area the shortest period of time necessary to accomplish the fire fighting mission.

f. Fire fighters will remain in the area until surveyed and released by Health Physics.

4. SPECIAL CONSIDERATIONS.

a. During fire fighting in areas where large radioactive sources are located, every effort will be made to cool the sources with a stream of water if the heat from the fire might cause the lead shielding to melt. In the

Radiation Therapy Theratron 80 Room, turn off electrical power including room lights at wall switch before using water.

b. Health Physics will conduct classes in radiation aspects of fighting fire in radioactive material use areas.

APPENDIX R

RADIOLOGICAL EMERGENCIES

1. PURPOSE.

a. The primary purpose of this Appendix is to ensure that an individual who is known or suspected to have been involved in a radiation accident and/or external exposure to ionizing radiation receives proper medical care, and that the possible radiation exposure is evaluated.

b. A secondary purpose of this Appendix is to ensure that the source of the accidental radiation exposure is contained, so that further exposure of personnel will be controlled.

2. GENERAL GUIDANCE.

a. It is assumed that radioactive material will be handled by qualified persons and in accordance with existing regulations and policies. It is expected that this Appendix will be interpreted by those persons in the light of their knowledge of the relative radioactivity of various radioactive material (radionuclides) in their possession.

b. A radiation accident may be defined as an unforeseen occurrence, either actual or suspected, involving exposure or contamination of humans and the environment by ionizing radiation. The accident will be considered as occurring over a short period of time, from seconds to several days. Chronic occupational or other long-term exposure will not be considered.

c. There are two ways in which humans can be exposed to ionizing radiation:

(1) External. The source of ionizing radiation may be outside the body, so that the radiation strikes the individual and is absorbed, depending upon its physical characteristics. Radiation from x-ray generators, particle accelerators, sealed and unsealed sources of radionuclides and reactors are examples of this type. The radiation may be beta, gamma, or neutron. Alpha emitters present no significant external hazard. Particle accelerators may produce other particles such as deuterons, mesons, etc. All persons who are known or suspected to have been externally exposed to an acute dose (within a 24 hour period) in excess of the following amounts, shall be reported immediately to the Radiation Protection Officer (568-5525):

(a) Whole body, head and trunk, active blood-forming organs, gonads or lens of the eye: 3 rem.

(b) Skin of the whole body and thyroid: 10 rem.

(c) Hands and forearms, feet and ankles: 30 rem.

(2) Internal. The source of ionizing radiation may gain entrance into the human body by inhalation, ingestion, injection, or absorption through the skin or injured body surface. Radionuclides may also be formed within the body following exposure to an external source of neutrons. All persons who are known or suspected of having been internally exposed to activities of radioactive material in excess of 1/10th of the amounts specified in Annex 1, this Appendix, shall be reported to the Radiation Protection Officer.

d. There should be no undue delay in the evacuation of the victim to the treatment facility, but there is seldom a need for unusual haste.

3. EMERGENCY SITUATIONS. In event of an emergency, the senior knowledgeable individual present will assume control of the situation and direct activities until relieved by proper authority. The exact actions and sequence of actions to be taken will be determined by the nature of the emergency. The following actions are typical responses to emergency situations.

a. Dismiss nonessential personnel.

b. Limit or eliminate the condition, if undue hazard to personnel does not exist; for example:

(1) Return sources to shielded container.

(2) Place absorbent material on spills.

(3) Turn off ventilation.

(4) Extinguish flames, heaters, etc.

(5) Turn off equipment.

c. Evacuate all personnel from the area.

d. Make certain that all personnel have left the area.

e. Restrict access to the area.

4. RESPONSIBILITIES.

a. Health Physics personnel will respond to all radiological emergencies and will:

(1) Provide technical guidance.

(2) Arrange additional resources (personnel, supplies and equipment).

(3) Supervise the reduction of radiological hazards.

APPENDIX R - Continued

(4) Monitor the persons who were in the vicinity of the accident if there is a reasonable probability that they may have been exposed or contaminated.

(5) Take action to prevent further contamination of personnel and equipment.

(6) File or coordinate all follow-up reports, actions, investigations, etc.

b. The Commander, WBAMC, will develop procedures to:

(1) Insure proper treatment of individuals who may have been accidentally exposed to ionizing radiation.

(2) Assure effective control of radiation contamination and radiation exposure of personnel.

c. The Radiation Protection Officer will provide direct support of patient care activities involving contaminated and/or radioactive patients to minimize occupational radiation exposure to medical personnel.

d. Radiation protection standards adopted for control of planned occupational exposures to ionizing radiation under emergency situations include:

(1) The Saving of Human Life:

(a) The accumulated total dose equivalent of radiation to the whole body should not exceed 100 rem.

(b) The accumulated total dose equivalent of radiation to hands and forearms not to exceed 300 rem.

(2) Less Urgent:

(a) The accumulated dose equivalent of radiation to whole body should not exceed 25 rem.

(b) The accumulated total dose equivalent of radiation to the hands and forearms should not exceed 100 rem.

1 Annex
Radioactivity Reference Levels

460779

ANNEX 1, (RADIOACTIVITY REFERENCE LEVELS) to APPENDIX R,(RADIOLOGICAL EMERGENCIES)

Material	Microcuries
Americium-241	.01
Antimony-122	100
Antimony-124	10
Antimony-125	10
Arsenic-73	100
Arsenic-74	10
Arsenic-76	10
Arsenic-77	100
Barium-131	10
*Barium-133	10
Barium-140	10
Bismuth-210	1
Bromine-82	10
Cadmium-109	10
Cadmium-115m	10
Cadmium-115	100
Calcium-45	10
Calcium-47	10
Carbon-14	100
Cerium-141	100
Cerium-143	100
Cerium-144	1
Cesium-131	1,000
Cesium-134m	100
Cesium-134	1
Cesium-135	10
Cesium-136	10
Cesium-137	10
Chlorine-36	10
Chlorine-38	10
Chromium-51	1,000
Cobalt-58m	10
Cobalt-58	10
Cobalt-60	1
Copper-64	100
Dysprosium-165	10
Dysprosium-166	100
Erbium-169	100
Erbium-171	100
Europium-152 9.2 h	100
Europium-152 13 yr	1
Europium-154	1
Europium-155	10
Fluorine-18	1,000
Gadolinium-153	10
Gadolinium-159	100
Gallium-72	10
Germanium-71	100
Gold-198	100
Gold-199	100
Hafnium-181	10
Holmium-166	100
Hydrogen-3	1,000
Indium-113m	100
Indium-114m	10
Indium-115m	100
Indium-115	10
Iodine-125	1
Iodine-126	1
Iodine-129	0.1
Iodine-131	1
Iodine-132	10
Iodine-133	1
Iodine-134	10
Iodine-135	10
Iridium-192	10
Iridium-194	100
Iron-55	100
Iron-59	10
Krypton-85	100
Krypton-87	10
Lanthanum-140	10
Lutetium-177	100
Manganese-52	10
Manganese-54	10
Manganese-56	10
Mercury-197m	100
Mercury-197	100
Mercury-203	10
Molybdenum-99	100
Neodymium-147	100
Neodymium-149	100
Nickel-59	100
Nickel-63	10
Nickel-65	100
Niobium-93m	10
Niobium-95	10
Niobium-97	10
Osmium-185	10
Osmium-191m*	100
Osmium-191	100
Osmium-193	100
Palladium-103	100
Palladium-109	100
Phosphorus-32	10
Platinum-191	100
Platinum-193m	100
Platinum-193	100
Platinum-197m	100
Platinum-197	100
Plutonium-239	.01
Polonium-210	0.1
Potassium-42	10
Praseodymium-142	100
Praseodymium-143	100
Promethium-147	10
Promethium-149	10
Radium-226	.01
Rhenium-186	100
Rhenium-188	100
Rhodium-103m	100
Rhodium-105	100
Rubidium-86	10
Rubidium-87	10
Ruthenium-97	100
Ruthenium-103	10
Ruthenium-105	10
Ruthenium-106	1
Samarium-151	10
Samarium-153	100
Scandium-46	10
Scandium-47	100
Scandium-48	10
Selenium-75	10
Silicon-31	100
Silver-105	10
Silver-110m	1
Silver-111	100
Sodium-24	10
Strontium-85	10
Strontium-89	1
Strontium-90	0.1
Strontium-91	10
Strontium-92	10
Sulphur-35	100
Tantalum-182	10
Technetium-96	10
Technetium-97m	100
Technetium-97	100
Technetium-99m	100
Technetium-99	10
Tellurium-125m	10
Tellurium-127m	10
Tellurium-127	100
Tellurium-129m	10
Tellurium-129	100
Tellurium-131m	10
Tellurium-132	10
Terbium-160	10
Thallium-200	100
Thallium-201	100
Thallium-202	100
Thallium-204	10
**Thorium (natural)[1]	100
Thulium-170	10
Thulium-171	10
Tin-113	10
Tin-125	10
Tungsten-181	10
Tungsten-185	10
Tungsten-187	100
**Uranium (natural)[2]	100
Uranium-233	.01
Uranium-234—Uranium-235	.01
Vanadium-48	10
Xenon-131m	1,000
Xenon-133	100
Xenon-135	100
Ytterbium-175	100
Yttrium-90	10
Yttrium-91	10
Yttrium-92	100
Yttrium-93	100
Zinc-65	10
Zinc-69m	100
Zinc-69	1,000
Zirconium-93	10
Zirconium-95	10
Zirconium-97	10

35 FR 6425

Any alpha emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition	.01
Any radionuclide other than alpha emitting radionuclides, not listed above or mixtures of beta emitters of unknown composition	.1

35 FR 6425

NOTE: For purposes of §§ 20.203 and 20.304, where there is involved a combination of isotopes in known amounts the limit for the combination should be derived as follows: Determine, for each isotope in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific isotope when not in combination. The sum of such ratios for all the isotopes in the combination may not exceed "1" (i.e., "unity"). Example: For purposes of § 20.304, if a particular batch contains 20,000 μCi† of Au^{198} and 50,000 μCi† of C^{14}, it may also include not more than 300 μCi† of I^{131}. This limit was determined as follows:

† $\frac{20{,}000\ \mu Ci\ Au^{198}}{100{,}000\ \mu Ci} + \frac{50{,}000\ \mu Ci\ C^{14}}{100{,}000\ \mu Ci} + \frac{200\ \mu Ci\ I^{131}}{1{,}000\ \mu Ci} = 1$

The denominator in each of the above ratios was obtained by multiplying the figure in the table by 1,000 as provided in § 20.304.

[1] Based on alpha disintegration rate of Th-232, Th-230 and their daughter products.
[2] Based on alpha disintegration rate of U-238, U-234, and U-235.
* Amended 36 FR 16898.
** Amended 39 FR 23990.
† Amended 38 FR 29314.

APPENDIX S

WBAMC RADIATION DOSIMETRY PROGRAM

1. PURPOSE. The purpose of this Appendix is to outline the requirements for the management of the WBAMC Radiation Dosimetry Program.

2. SCOPE. This Appendix applies to all users of the WBAMC Radiation Dosimetry Program. The WBAMC Radiation Protection Officer (568-5525) is responsible for management of the Radiation Dosimetry Program. Individuals designated by department, service, or Duty Section Chiefs as dosimetry monitors are responsible for coordinating issue and turn-in of dosimetry badges for their area.

3. PROCEDURES.

a. The primary WBAMC ionizing radiation dosimeter is the whole body badge. Supplementary badges (i.e., TLD ring, collar badge, etc.), may also be issued, depending upon the specific radiation exposure hazard as determined by the Radiation Protection Officer. Badges will be exchanged monthly on the first Sunday of each month. New badges will be supplied by Health Physics personnel prior to the day of exchange. Dosimetry monitors will remove the expired badges for the previous wearing period, insert the new badges in each assigned wearer's badge holder, and collect all the old badges for pick-up by Health Physics personnel within three days following the exchange date.

b. A Dosimetry Report listing all permanent badge wearers will accompany the new badges. The dosimetry monitors will verify the accuracy of the list each month. Corrections and/or deletions will be noted on the report and returned with the old badges.

c. The badge wearer should note that the number of his badge is his assigned number for the wearing period. These numbers are assigned by the Health Physics Office. To identify one's badge, one's name and section may be taped to the front of the badge, however, the opening in the front of the badge holder will NOT be covered by a label or tape.

d. To add an individual to the Radiation Dosimetry Program, a completed and signed DD Form 1952 (Dosimeter Application and Record of Occupational Radiation Exposure) for each newly assigned radiation worker will be submitted to the Radiation Protection Officer, Preventive Medicine Activity. Only Items 1 through 10 and the Occupational Exposure History on DD Form 1952 are to be completed by the applicant. Items 11 through 20 on DD Form 1952 are for Health Physics Office use only. An example of a properly completed DD Form 1952 is attached as Annex 1 to this Appendix.

e. Because of the importance of the Radiation Dosimetry Program, it is imperative that every badge wearer treat the badge with care, and return it

to their monitor for exchange in a timely manner. When a badge is lost or turned in late, the Radiation Protection Officer will investigate the circumstances and will caution the badge wearer to be more careful in safeguarding the badge. Radiation exposures will be recorded IAW AR 40-14.

1 Annex
DD Form 1952

EXAMPLE

DOSIMETER APPLICATION AND RECORD OF OCCUPATIONAL RADIATION EXPOSURE

Print legibly or type all information requested. See Privacy Act Statement on reverse.

1. FULL NAME (Last, First, Middle)	2. DATE OF BIRTH (YYMMDD)	3. SOCIAL SECURITY NO.
Doe, John James	620816	000-00-0000

4. DUTY SECTION (Dept., Ward, Unit, etc.)	5. JOB TITLE	6. DUTY PHONE
Radiology	X-Ray Tech.	569-0000

7. PAY GRADE		8. HAVE YOU WORN A DOSIMETER ISSUED BY THIS COMMAND IN THE PAST	9. DATE OF RADIATION PHYSICAL (YYMMDD)
CIVILIAN	MILITARY	☐ YES ☑ NO	840112
	E4		

10. DUTY STATUS	IF TRANSIENT SHOW MAILING ADDRESS (street address, city, state, zip code) OF LOCATION OF HEALTH RECORDS
☑ PERMANENT ☐ TRANSIENT 6 WEEKS OR LESS	

EXPOSURE INFORMATION *(ITEMS 11 THROUGH 20 FOR HEALTH PHYSICS USE ONLY)*

11. CLASSIFICATION OF EXPOSURE
☐ EXTERNAL ☐ NEUTRON ☐ INTERNAL

12. BADGES REQUIRED	13. TLD REQUIRED
☐ WRIST ☐ WHOLE-BODY ☐ NEUTRON	☐ WRIST ☐ WHOLE-BODY ☐ FINGER

14. BIOASSAYS REQUIRED

WHOLE-BODY COUNT	THYROID UPTAKE	URINALYSIS	FREQUENCY
☐ YES ☐ NO	☐ YES ☐ NO	☐ α ☐ β ☐ β-γ	☐ MONTHLY ☐ QUARTERLY ☐ ANNUALLY

GIVE DATES FOR ITEMS 15 THROUGH 20 (YYMMDD)

15. DOSIMETER(S) ISSUED	16. DD FORM(S) 1141 INITIATED	17. DOSIMETER(S) DISCONTINUED

18. LAST DOSIMETER(S) RETURNED	19. LOCATOR CARD TO HEALTH RECORD	20. DD FORM(S) 1141 TO MEDICAL RECORDS

OCCUPATIONAL EXPOSURE HISTORY

NOTE: This section only applies to the individual who has worked with radiation-producing devices or radioisotopes in a permanent status. List only those employers for whom you worked with radiation.

NAME OF EMPLOYER	ADDRESS (street address, city, state, zip code)	FROM		TO		Do not write in this space
		YR	MO	YR	MO	
U.S. Army	AHS, Ft. Sam Houston, TX 78234	84	01	84	07	
	TOTAL EXPOSURE DATA					

REMARKS

DD FORM 1952 (1 NOV 74) EDITION OF 1 SEP 74 IS OBSOLETE. (see reverse)

PRIVACY ACT STATEMENT
DATA REQUIRED BY THE PRIVACY ACT OF 1974
(5 USC 552a)

1. TITLE OF FORM: Dosimeter Application and Record of Occupational Radiation Exposure.

2. PRESCRIBING DIRECTIVE: AR 40-14 and DLAR 4145.24.

3. AUTHORITY: 5 USC 301-Departmental Regulation; 10 USC 1071, Medical and Dental Care, Purposes; 42 USC 2073, 2093, 2095, 2111, 2133, 2134, 2201(b), and 2201(o). The authority for soliciting the social security number is 10 CFR 20, 44 USC 3101-Record Management by Agency Heads, General Duties.

4. PRINCIPAL PURPOSE(S): To establish qualification of personnel monitoring and document previous exposure history. The information is used in the evaluation of risk of exposure to ionizing radiation or radioactive materials. The data permits meaningful comparison of both current (short-term) and long-term exposure to ionizing radiation or radioactive material. Data on your exposure to ionizing radiation or radioactive materials is available to you upon request.

5. ROUTINE USES: The information may be used to provide data to other Federal agencies, academic institutions, and non-governmental agencies, such as the National Council on Radiation Protection and Measurement and the National Research Council, involved in monitoring/evaluating exposures of individuals to ionizing radiation or radioactive materials who are employed as radiation workers on a permanent or temporary basis and exposure received by monitored visitors. The information may also be disclosed to appropriate authorities in the event the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding.

6. MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION: It is voluntary that you furnish the requested information, including social security number; however, the installation or activity must maintain a completed DD Form 1141 on each individual occupationally exposed to ionizing radiation or radioactive material as required by 10 CFR 20, 29 CFR 1910.96 and AR 40-14/DLAR 4145.24. If information is not furnished, individual may not become a radiation worker. The social security number is used to assure that the Army/Agency has accurate identifier not subject to the coincidence of similar names or birthdates among the large number of persons on whom exposure data is maintained.

STATEMENT

Under the provisions of 10 CFR 19.13, 29 CFR 1910.96 and the Privacy Act of 1974, I hereby authorize the release of, and request that all of my radiation exposure records be furnished appropriate authorities in accordance with the "Routine Uses" portion of the above Privacy Act Statement. As a radiation worker, I have been provided instructions in radiation protection as required by 10 CFR 19.12 and 29 CFR 1910.96. As a female radiation worker, I have been informed of the biological affects and the risks from ionizing radiation on the embro-fetus and received a copy of NRC (Nuclear Regulatory Commission) Guide 8.13. I will contact my supervisor or the radiation protection officer if I have any questions. I hereby certify that the exposure history listed on the obverse is correct and complete, to the best of my knowledge and belief. I have read and understand the above Privacy Act Statement.

840820
Date (YYMMDD)

John J. Doe
Signature of Applicant

APPENDIX T

DECONTAMINATION AND REPORTING PROCEDURES/BROKEN BACTEC VIALS

1. BACKGROUND. The BACTEC system utilizes a very small quantity of Carbon-14, a radioactive material that emits a weak beta particle. The personnel hazard associated with a beta emitter is internal in nature, that is, the material must be ingested or enter the body through an open wound to be harmful. White it is true that potential personnel hazards from an occasional breaking of a BACTEC vial are small, it is possible that the accumulation of Carbon-14 which is not completely removed by cleaning procedures could result in buildup or spread of contamination in the hospital. To minimize this potential, specific procedures are required to insure the maximal removal of Carbon-14 contamination resulting from the breaking of a BACTEC vial.

2. RESPONSIBILITIES.

a. The individual breaking a vial.

(1) If ingestion or wound contamination is suspected, notify the Radiation Protection Officer immediately (568-5525) during normal duty hours. After duty hours, notify the Administrative Officer of the Day (AOD).

(2) Follow cleanup procedures in paragraph 3 below.

(3) Notify the Bacteriology/Microbiology Service, Department of Pathology and Laboratory Services (569-2210) for technical assistance in cleanup.

b. Radiation Protection Officer.

(1) Monitor contaminated wounds and arrange for evaluation, by a physician, of the extent of hazard resulting from internal uptake.

(2) Perform a follow-up area survey.

c. Pathology Laboratory.

(1) Clean any spills in its own area and provide technical advice to users in cleanup of spills in other areas within the hospital (Bldg 7777).

(2) Notify the Radiation Protection Officer (568-5525) of the location of the spill NLT 0730 of the next normal working day.

d. Areas using BACTEC vials.

(1) Keep pre-assembled decontamination materials in a readily accessible location.

(2) Insure personnel are familiar with contents of this document.

3. CLEAN-UP PROCEDURES.

a. Decontamination Materials.

(1) Disposable rubber/plastic gloves

(2) Heavy duty plastic bag

(3) Absorbent paper towels

(4) Cleaning solution (soap and a disinfectant such as O-Syl)

(5) Absorbent bed pad with waterproof backing

(6) Masking tape

(NOTE: If person breaking vial has contaminated clothing or shoes, someone else should obtain above items and procedures in para 3d should be followed).

b. Wound Decontamination Procedures.

(1) Flush wound with large volumes of running water immediately and spread the edges to permit flushing action.

(2) Report the wound in accordance with para 2a above.

c. Area Decontamination Procedures.

(1) Carefully pick up large pieces of glass and place in plastic bag.

(2) Use paper towels to absorb material. DO NOT RUB, since the material may become harder to clean up. Make only one swipe over the spill. Place waste paper in plastic bag.

(3) Use soap and a disinfectant such as O-Syl to clean area after most of the liquid is absorbed. Remember that the spill may also be a biologic hazard if the vial had been inoculated with patient blood.

(4) Place all used cleaning materials (paper towels, gloves) into plastic bag.

(5) Rewash area with soap and a small quantity of water at least two more times.

(6) Seal bag with masking tape and mark ward designation and contents as BACTEC waste.

APPENDIX T - continued

(7) Cover area with bedding pad, absorbent side down, and seal edges with tape. Do not remove until cleared by the Radiation Protection Officer.

(8) Bag with waste should be disposed of as infectious waste by double-bagging in an infectious waste bag and placing in an infectious waste container.

(9) Thoroughly wash hands and return to work.

d. Clothing Decontamination Procedures.

(1) Shoes may be wiped off with a paper towel and cleaned with a soap solution (top and bottom), and should be surveyed by the Radiation Protection Officer before continued use. This is an effort to eliminate the spread of the material to other areas of WBAMC. Operating room-type disposable shoe covers may be worn until the end of the work shift if an extra pair of shoes is not available.

(2) Outer clothing should be changed. The contaminated clothing should be placed in a plastic bag, the bag marked with ward or area designation and "BACTEC" and then placed in the contaminated laundry container.

(3) If clothing is not WBAMC issue, it may be taken home in the plastic bag. Launder these items separately and then run the washer through at least one additional full cycle with soap but without clothing in it.

APPENDIX U

BIOASSAY PROGRAM

1. PURPOSE. The purpose of this Appendix is to describe the bioassay program at WBAMC.

2. GENERAL. A bioassay program is maintained to verify that internal exposure is monitored.

3. SCOPE. The use of unsealed radioactive materials at WBAMC is very modest except in Nuclear Medicine. Use of beta emitters in the Clinical Investigations Service is restricted to microcurie levels, with the normally used isotopes being hydrogen-3 and carbon-14.

4. BIOASSAY OF IODINE ISOTOPES AND OTHER SELECTED GAMMA EMITTING ISOTOPES

a. Iodine-125 used in radioimmunoassay. The activities of iodine-125 used in routine radioimmunoassay work rarely exceed ten microcuries and workers who perform only routine radioimmunoassay procedures are not included in the bioassay program. Workers who conduct iodinations for experimental radioimmunoassay research are included in the same category as Nuclear Medicine personnel for bioassay purposes.

b. Iodine-125 and iodine-131 used in diagnostic and therapeutic nuclear medicine. The bioassay program for this category of personnel will be administered in accordance with USNRC Regulatory Guide 8.20, "Applications of Bioassay for I-125 and I-131," dated September 1979. All iodine compounds used at WBAMC will be considered to be "volatile or dispersible" unless there is definite evidence to the contrary, for the purposes of bioassay.

c. Radioisotopes other than iodine-125 and iodine-131. The BACTEC system uses only small quantities of carbon-14 and is not included in the bioassay program. Uses of radioisotopes other than hydrogen-3 and carbon-14 in the Clinical Investigations Service are very limited and only rarely involve activities greater than a few hundred microcuries, and workers are not included in the routine bioassay program. Radioisotopes used in Nuclear Medicine other than iodine-125 and iodine-131 are either immeasurable by bioassay (e.g., xenon-133) or are used in relatively small quantities or at infrequent intervals (e.g., gallium-67, chromium-51, selenium-75); technetium-99m has been found to be primarily an external contamination hazard. Workers in Nuclear Medicine are therefore included in the routine bioassay program under the provisions of paragraph 4b above.

5. NON-ROUTINE BIOASSAYS. The WBAMC Radiation Control Committee may direct that individuals be monitored by bioassay as it deems appropriate, especially following incidents of suspected or known accidental ingestion of radioactive materials.

APPENDIX V

HANDLING OF ANIMALS CONTAINING RADIOACTIVE MATERIALS

1. PURPOSE. The purpose of this Appendix is to prescribe the control measures which will be observed during the use of animals containing radioactive materials.

2. GENERAL.

a. Animals used for radioactive material research and teaching purposes at WBAMC will be under the direct care of the veterinarian (D.V.M.) assigned to the Department of Clinical Investigation.

b. Animals containing radioactive materials will be housed in the Animal Research Facility, Bldg 7776.

3. RADIATION CONTROL COMMITTEE APPROVAL OF ANIMAL USE RESEARCH PROTOCOLS. Research protocols involving the use of radioactive material in animals will be submitted to the Radiation Control Committee (RCC) or Subcommittee (see Appendix A) for approval prior to start of the project, and will include the following information:

a. Name of Principal User responsible for the safe use of radioactive material for the proposed research project. (The Principal User, who will normally be the principal investigator or an associate investigator, must be authorized by the Radiation Control Committee to use the radionuclides specified in the research proposal).

b. Number and species of animals to be used in the project.

c. Radionuclide(s) to be used.

d. Radioactivity dose per animal, in millicuries or microcuries, for each species and radionuclide (dose per injection and total dose).

e. Personnel dosimetry (film badge, ring TLD) and/or other radiation monitoring to be used.

f. Procedures for handling radioactive material and animals, including excreta. (May reference a Radiation Protection Officer approved SOP by title and date, or procedures specified for a previously approved research project).

g. Requirement for disposal of animal carcasses: Number, frequency, and duration (e.g., 5 per month for 10 months). If animals are not to be disposed of after completion of the project, specify the further use for the animals.

h. Estimated project starting and completion dates. (Proposals with non-routine disposal requirements must be submitted to the RCC at least 60 days in advance to allow sufficient time for procurement of shipping containers

and packaging materials. "Non-routine" includes an unusually large number or size of animals, or any radionuclide with a radioactive decay half-life of 65 days or longer).

4. HANDLING OF ANIMALS, RADIOACTIVE WASTE, AND CARCASSES.

a. Animals containing radioactive material will be isolated in one of the animal rooms in Bldg 7776 until the end of the study and will be handled in accordance with specific instructions provided by the Radiation Protection Officer for each animal research protocol. All animal handlers will wear the Army film badge and additional dosimeters as specified by the Radiation Protection Officer (see Appendix E).

b. Animal waste and carcasses will be disposed of as directed by the Radiation Protection Officer (see Appendix J).

5. DECONTAMINATION OF ANIMAL CAGES AND HOLDING ROOMS.

a. A mobile high pressure (700 psi) spray cleaner is used to clean all cages and rooms following each study. Gross contamination (feces, litter) is discarded as radioactive waste (see para 4 above). Normally only shortlived radioisotopes are used and cages are held for decay before cleaning. Waste water is mopped up and discarded as radioactive waste if appropriate.

b. The Radiation Protection Officer will survey all cages and rooms prior to release of these facilities for general use.

6. SECURITY. The Animal Research Facility is locked at all times that assigned and specially authorized personnel are not present.

APPENDIX W

REFERENCES

ARMY REGULATIONS

40-5	Health and Environment
40-7	Use of Investigational Drugs in Humans and the Use of Schedule I Controlled Drug Substances
40-13	Medical Support-Nuclear/Chemical Accidents and Incidents
40-14	Control and Recording Procedures for Exposure to Ionizing Radiation and Radioactive Materials
40-37	Licensing and Control of Radioactive Materials for Medical Purposes
40-38	Clinical Investigation Program
40-46	Control of Health Hazards from Lasers and Other High Intensity Optical Sources
40-61	Medical Logistics Policies and Procedures
40-583	Control of Potential Hazards to Health from Microwave and Radio Frequency Radiation
70-25	Use of Volunteers as Subjects of Research
200-1	Environmental Protection and Enhancement
385-10	Army Safety Program
385-11	Ionizing Radiation Protection
385-30	Safety Color Code Markings and Signs
385-40	Accident Reporting and Records
640-10	Individual Military Personnel Records
700-64	Radioactive Commodities in the DOD Supply System
725-1	Special Authorization and Procedures for Issue, Sales and Loans

TECHNICAL MANUALS

3-220	Chemical, Biological, and Radiological Decontamination
55-315	Transportability Guidance for Safe Transport of Radioactive Materials

TECHNICAL BULLETINS

TB MED 291	Guidance for Inventory, Control, and Accountability of Drugs and Injection Devices of Potential Abuse at Medical Treatment Facilities Worldwide
TB MED 521	Management and Control of Diagnostic X-Ray, Therapeutic X-Ray, and Gamma-Beam Equipment
TB MED 522	Control of Health Hazards from Radioactive Material Used in Self-Luminous Devices
TB MED 523	Control of Hazards to Health from Microwave and Radio Frequency Radiation and Ultrasound

APPENDIX W - continued

REFERENCES - TECHNICAL BULLETINS (cont'd)

TB MED 524	Control of Hazards to Health from Laser Radiation
TB 43-0116	Identification of Radioactive Items in the Army Supply System

SUPPLY BULLETINS

SB 8-74	Adaptometer, Radioactive Plaque, Night Vision, NSN 6515-00-382-1000, NRC License No. 37-11831-01
SB 11-206	Film Badge (Photodosimetry) Supply and Service for Technical Radiation Exposure Control

CODE OF FEDERAL REGULATIONS

Title 10	US Nuclear Regulatory Commission
Title 21	Food and Drug Administration
Title 29	Occupational Safety and Health Administration
Title 49	Department of Transportation

MISCELLANEOUS

Reports of the National Council on Radiation Protection and Measurements (NCRP)
Reports of the International Commission on Radiation Units and Measurements (ICRU)
Recommendations of the International Commission on Radiological Protection (ICRP)
Handbooks of the National Bureau of Standards (NBS)
Standards of the American National Standards Institute (ANSI)
Regulatory Guides of the US Nuclear Regulatory Commission (USNRC)

DEPARTMENT OF THE ARMY
WILLIAM BEAUMONT ARMY MEDICAL CENTER
EL PASO, TEXAS 79920

HSHM-PMA-RP

9 December 1982

SUBJECT: Renewal of USNRC Byproduct Material License No. 42-05255-07, USNRC Control No. 99504

THRU: Commander 7/22 Dec 82
US Army Health Services Command
ATTN: HSPA-P
Fort Sam Houston, Texas 78234

TO: HQDA (DASG-PSP-E) 7 Feb 83
~~Washington~~, D.C. 20310

1. References.

a. Renewal Application for US Nuclear Regulatory Commission (USNRC) Byproduct Material License (BML) No. 42-05255-07, 29 March 1979, USNRC Control No. 99504.

b. Letter, William Beaumont Army Medical Center (WBAMC), 30 March 1979, subject: Renewal of BML No. 40-05255-07.

c. USNRC Regulatory Guide 8.20, Applications of Bioassay for I-125 and I-131, Revision 1, September 1979.

d. USNRC Regulatory Guide 8.23, Radiation Safety Surveys at Medical Institutions, Revision 1, January 1981.

e. USNRC Regulatory Guide 10.8, Guide for the Preparation of Applications for Medical Programs, Revision 1, October 1980.

f. Phonecon between Mr. R. Mason, USNRC, and CPT Carl Bergsagel, WBAMC, 22 June 1982, subject: Additional Information Required for Renewal of USNRC BML No. 42-05255-07.

2. Request the following changes be made to this Medical Center's license renewal application dated 29 March 1979 (reference 1a above):

a. Change all references to USNRC Regulatory Guide 8.20, April 1978, to read: USNRC Regulatory Guide 8.20, Revision 1, September 1979.

HSHM-PMA-RP 9 December 1982
SUBJECT: Renewal of USNRC Byproduct Material License No. 42-05255-07, USNRC Control No. 99504

b. Change all references to USNRC Regulatory Guide 10.8, January 1979, to read: USNRC Regulatory Guide 10.8, Revision 1, October 1980.

c. Change all references to WBAMC Radioassay Laboratory, Room 12-37, to read: Room 12-36.

d. Tab F, page F-5, paragraph 11a(3)(b):

(1) Delete the sentence, "Radioactive waste resulting from radioassay work is loaded into a DOT 17H 55-gallon drum containing sufficient sawdust to absorb more than twice the volume of the liquid disposed into the drum," and substitute the following sentences: Radioactive waste resulting from radioassay work, other than that disposed of in the sanitary sewer system, is placed into DOT - approved radioactive waste disposal containers. Absorbant material is added to the containers of a type and quantity to meet USNRC, DOT, and disposal facility packaging requirements.

(2) Delete the sentence "Glassware is washed in the stainless steel sink in Room 12-6 and no radioactive waste is disposed through the sink in Room 12-37," and substitute the following sentence: Glassware is washed in stainless steel sinks in Room 12-6 and Room 12-36. Liquid radioactive waste is disposed of in these stainless steel sinks and other sinks as designated by the Radiation Protection Officer, in accordance with Section 20.303 of 10 CFR Part 20.

e. Tab F, page F-7, paragraph 11a(6): Delete the sentence, "The patient collects his total urine output during iodine-131 therapies and the gallon jugs containing this urine are stored in the Decay Room until background radiation levels are achieved," and substitute the following sentence: Excreta from patients undergoing medical diagnosis or therapy with radiopharmaceuticals is disposed of in accordance with Section 20.303 of 10 CFR Part 20 and paragraph 9 of Appendix K, USNRC Regulatory Guide 10.8, Revision 1 dated October 1980.

f. Tab H, WBAMC Regulation 40-14:

(1) Page 2 of Change 1 to WBAMC Regulation 40-14: Delete the change to page J-2, paragraph 3d(2), and substitute the following: Excreta from patients undergoing medical diagnosis or therapy with radiopharmaceuticals will be disposed of as directed by the Radiation Protection Officer in accordand with US Nuclear Regulatory Commission (USNRC) regulations and USNRC License requirements.

(2) Appendix J of WBAMC Regulation 40-14, page J-2: Delete paragraph 3d(5), and substitute the following: Ultimate disposal of radioactive

waste will be accomplished by the Radiation Protection Officer in accordance with 10 CFR Part 20.

(3) Appendix L of WBAMC Regulation 40-14, page L-1: Delete paragraph 2a, and substitute the following: Health Physics personnel will perform radiation protection surveys in each area utilizing licensed radioactive materials at a frequency commensurate with the nature, quantity, and hazard potential of the material used. A written report of deficiencies, if found, and corrective action required will be provided to the Principal User.

(4) Annex 1 to Appendix N of WBAMC Regulation 40-14, page N-1-1: Delete the first sentence of paragraph 3c, and substitute the following sentence: When required by the Radiation Protection Officer, hospital personnel must wear a film badge or other specified dosimetry device when entering the patient's room.

(5) Annex 1 to Appendix N of WBAMC Regulation 40-14, page N-1-3: Delete paragraph m(1) and substitute the following: Visitors should not be permitted to stay with the patient longer than specified by the Radiation Protection Officer. Health Physics personnel will monitor the patient area and will indicate a "safe distance" line for visitors. Except for the initial greeting, visitors should not stay closer to the patient than this line.

3. In addition to the above changes to the renewal application dated 29 March 1979 (reference 1a above) the following information is submitted as requested in phonecon on 22 June 1982 (reference 1f above):

a. Radioactive Waste Disposal:

(1) Liquid radioactive waste will normally be disposed of in the sanitary sewer system in accordance with Section 20.303 of 10 CFR Part 20. When disposal in the sanitary sewer system is not permissable due to the chemical form of the waste, or the amount of radioactivity exceeds the limits specified in Section 20.303 of 10 CFR Part 20, liquid radioactive waste will be disposed of by one of the following methods, as appropriate:

(a) Held for decay until the amount of radioactivity remaining permits disposal in the sanitary sewer system within the limits specified in Section 20.303 of 10 CFR Part 20, and disposed of in the sanitary sewer system.

(b) Held for decay until radiation levels, as measured in a low background area with a low-level survey meter and with all shielding removed, have reached background levels. All radiation labels on containers

will be removed or obliterated and the waste will be disposed of in normal trash, or as required to comply with applicable federal, state and local regulations governing any other toxic or hazardous property of the waste.

(c) When holding for decay is not feasible, such as with large volumes of long half-life (65 days or longer) waste, liquid waste that cannot be disposed of in the sanitary sewer in accordance with Section 20.303 of 10 CFR Part 20 will be packaged in accordance with USNRC and Department of Transportation (DOT) requirements and shipped to a USNRC or Agreement State Licensed disposal facility for disposal.

(d) Liquid scintillation counting medium containing hydrogen-3 or carbon-14 will be disposed of in accordance with Section 20.306 of 10 CFR Part 20. Medium with radioactivity exceeding the limit specified in Section 20.306 of 10 CFR Part 20 will be disposed of as stated in paragraph 3a(1)(c) above.

(2) Mo-99/Tc-99 generators will be returned to the supplier for disposal.

(3) Other solid waste will be disposed of by one of the following methods, as appropriate:

(a) Held for decay until radiation levels, as measured in a low background area with a low-level survey meter and with all shielding removed, have reached background levels. All radiation labels will be removed or obliterated, and the waste will be disposed of in normal trash, or as required to comply with applicable federal, state and local regulations governing any other toxic or hazardous property of the waste.

(b) When holding for decay is not feasible, such as with large volumes of long half-life (65 days or longer) waste, the waste will be packaged in accordance with USNRC and DOT requirements and shipped to a USNRC or Agreement State licensed disposal facility for disposal.

(c) Animal tissue containing hydrogen-3 or carbon-14 will be disposed of in accordance with Section 20.306 of 10 CFR Part 20. Animal tissue with radioactivity exceeding the limit specified in Section 20.306 of CFR Part 20 will be disposed of as stated in paragraph 3a (3)(b) above.

b. Personnel Training Program:

(1) All personnel working in a restricted area, as defined in Section 19.3 of 10 CFR 19, are instructed in radiation protection topics

prescribed by Section 19.12 of 10 CFR Part 19 at the time of initial employment. In addition, annual instruction in topics prescribed by Section 19.12 of 10 CFR Part 19 is given by the Health Physics staff to personnel working in restricted areas.

(2) Personnel who frequent a restricted area, to include nursing, housekeeping, fire protection, and security personnel receive instruction in radiation protection topics applicable to their duties in conjunction with initial orientation and training. In addition, annual instruction in topics prescribed by Section 19.12 of 10 CFR Part 19 is given by the Health Physics staff to nursing, housekeeping, fire protection, and security personnel who frequent a restricted area.

c. Radiation Safety Surveys:

(1) Radiation safety surveys will be performed by radioactive material users and the Health Physics staff in all areas where licensed radioactive material is used or stored. The frequency of radiation safety surveys will be commensurate with the nature, quantity, and hazard potential of the material used. As a minimum, radiation safety surveys will be performed at frequencies specified in Table 1 of Regulatory Guide 8.23, Revision 1 dated January 1981 (reference 1d above).

(2) Decontamination will be performed when radiation safety surveys detect removable contamination in excess of the limits specified in Table 2 of Regulatory Guide 8.23, Revision 1 dated January 1981. Decontamination of surfaces in restricted and unrestricted areas will be performed when total contamination, including both fixed and removable contamination, exceeds the limits appearing on lines 1 and 2 of Table 2, multiplied by a factor of 5.

d. After Hours Receipt of Radioactive Material Shipments: Radioactive material shipments delivered during other than normal duty hours are accepted by the Administrative Officer of the Day (AOD) in accordance with the following procedures which are posted in the AOD Instruction Book:

MEDICAL SUPPLY SHIPMENTS (NUCLEAR MEDICINE)

1. Shipments of radioactive materials are frequently received during other than normal duty hours. These packages must be delivered to Rm 12-36, the Nuclear Medicine Radioassay Laboratory, as soon as they are received. UNDER NO CIRCUMSTANCES WILL A RADIOACTIVE SHIPMENT BE PHYSICALLY LOCATED IN THE AOD OR NCOD ROOMS LONGER THAN FIFTEEN (15) MINUTES.

HSHM-PMA-RP 9 December 1982
SUBJECT: Renewal of USNRC Byproduct Material License No. 42-05255-07, USNRC Control No. 99504

2. Annotate any receipt on the AOD report.

3. For deliveries between 1630 and 2400 hrs call the Radioassay laboratory (9-2152) for instructions. After 2400 hrs or if you receive no answer at the laboratory, call the technician on call (see RIA Lab Call Schedule) 1.) at home or 2.) by beeper.

4. The hospital Security Office will provide access to the Radioassay Laboratory.

5. IF PACKAGE IS WET OR APPEARS TO BE DAMAGED:

a. IMMEDIATELY contact the WBAMC Radiation Protection Officer. (See card titled "Radiation Protection Officer Assistance" for phone number).

b. Do not allow the package to be touched without rubber gloves on hands.

c. Obtain the names of all local individuals, including the carrier, who came in contact with the package, and have them remain at the hospital until it can be determined that neither they nor the delivery vehicle are contaminated.

Current office and home telephone numbers of the Radiation Protection Officer and Alternate Radiation Protection Officer(s) are posted in the AOD instruction book under "Radiation Protection Officer Assistance."

e. Radioactive Drugs for Certain Research Uses: Human Use of radioactive drugs for basic research, as defined in Section 361.1 of 21 CFR Part 361, will not be conducted unless approved by a Food and Drug Administration approved Radioactive Drug Research Committee under the provisions of 21 CFR Part 361.

4. For further information concerning this license renewal application contact CPT Carl Bergsagel, Radiation Protection Officer, telephone (915) 568-5525, (AUTOVON 978-5525, FTS 478-5525).

FOR THE COMMANDER:

James C. Wingate
JAMES C. WINGATE
Major, MSC
Adjutant General