NRC FORM 313M (9-81) 10 CFR 35	U.S. NUCLEAR REGULATORY COMMISSION APPLICATION FOR MATERIALS LICENSE – MEDICAL	Approved by OMB 3150-0041 Expires 9-30-83

INSTRUCTIONS – *Complete Items 1 through 26 if this is an initial application or an application for renewal of a license. Use supplemental sheets where necessary. Item 26 must be completed on all applications and signed. Retain one copy. Submit original and one copy of entire application to: Director, Office of Nuclear Materials Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Upon approval of this application, the applicant will receive a Materials License. An NRC Materials License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Parts 19, 20 and 35 and the license fee provision of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in Item 26 and the appropriate fee enclosed.*

RECEIVED DEC 12 1983

1.a. NAME AND MAILING ADDRESS OF APPLICANT *(Institution, firm, clinic, physician, etc.)* INCLUDE ZIP CODE

SOUTHWESTERN HOSPITAL
401 LEE BLVD.
LAWTON, OKLAHOMA 73501

TELEPHONE NO.: AREA CODE(405 355 2700

1.b. STREET ADDRESS(ES) AT WHICH RADIOACTIVE MATERIAL WILL BE USED *(If different from 1.a.)* INCLUDE ZIP CODE

2. PERSON TO CONTACT REGARDING THIS APPLICATION

Mr. Tom Rine

TELEPHONE NO.: AREA CODE 405) 355 2700

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

a. ☐ NEW LICENSE
b. ☒ AMENDMENT TO LICENSE NO. 35-10669-02
c. ☐ RENEWAL OF LICENSE NO. _____

4. INDIVIDUAL USERS *(Name individuals who will use or directly supervise use of radioactive material. Complete Supplements A and B for each individual.)*

J.P. Reimer, M.D.

5. RADIATION SAFETY OFFICER (RSO) *(Name of person designated as radiation safety officer. If other than individual user, complete resume of training and experience as in Supplement A.)*

J.P. Reimer, M.D.

6.a. RADIOACTIVE MATERIAL FOR MEDICAL USE

RADIOACTIVE MATERIAL LISTED IN:	ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)
10 CFR 31.11 FOR IN VITRO STUDIES		
10 CFR 35.100, SCHEDULE A, GROUP I		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP II		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP III		
10 CFR 35.100, SCHEDULE A, GROUP IV	X	AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP V	X	AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP VI	X	50

ADDITIONAL ITEMS:	MARK ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)
IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM	X	20
PHOSPHORUS-32 AS SOLUBLE PHOSPHATE FOR TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA AND BONE METASTASES		
PHOSPHORUS-32 AS COLLOIDAL CHROMIC PHOSPHATE FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
GOLD-198 AS COLLOID FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
IODINE-131 AS IODIDE FOR TREATMENT OF THYROID CARCINOMA	X	100
XENON-133 AS GAS OR GAS IN SALINE FOR BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES.		

6.b. RADIOACTIVE MATERIAL FOR USES NOT LISTED IN ITEM 6.a. *(Sealed sources up to 3 mCi used for calibration and reference standards are authorized under Section 35.14(d), 10 CFR Part 35, and NEED NOT BE LISTED.)*

ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	MAXIMUM NUMBER OF MILLICURIES OF EACH FORM	DESCRIBE PURPOSE OF USE

RECEIVED BY LFMB
Date 12/15/83
Log No. 5 II
By Brown
Orig. To
Action Compl 12/19/83

QM I
Applicant
Check No. 209777 $48-7B
Amount/Fee Cat.
Type of Fee Amendment
Date Check Rec'd 12/15/83
Received By Brown

60146

NRC FORM 313M (9-81)

8406290469 840611
NMS LIC30
35-10669-02 PDR

INFORMATION REQUIRED FOR ITEMS 7 THROUGH 23

For Items 7 through 23, check the appropriate box(es) and submit a detailed description of all the requested information. Begin each item on a separate sheet. Identify the item number and the date of the application in the lower right corner of each page. If you indicate that an appendix to the medical licensing guide will be followed, do not submit the pages, but specify the revision number and date of the referenced guide: Regulatory Guide 10.8 Rev. _____ Date: _____

7. MEDICAL ISOTOPES COMMITTEE	
	Names and Specialties Attached; and
	Duties as in Appendix B; or *(Check One)*
X	Equivalent Duties Attached
8. TRAINING AND EXPERIENCE	
X	Supplements A & B Attached for Each Individual User; and ALREADY ON FILE
	Supplement A Attached for RSO.
9. INSTRUMENTATION *(Check One)*	
	Appendix C Form Attached; or
X	List by Name and Model Number
10. CALIBRATION OF INSTRUMENTS	
	Appendix D Procedures Followed for Survey Instruments; or *(Check One)*
X	Equivalent Procedures Attached; and
X	Appendix D Procedures Followed for Dose Calibrator; or *(Check One)*
	Equivalent Procedures Attached
11. FACILITIES AND EQUIPMENT	
X	Description and Diagram Attached
12. PERSONNEL TRAINING PROGRAM	
X	Description of Training Attached
13. PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL	
X	Detailed Information Attached
14. PROCEDURES FOR SAFELY OPENING PACKAGES CONTAINING RADIOACTIVE MATERIALS *(Check One)*	
	Appendix F Procedures Followed; or
X	Equivalent Procedures Attached

15. GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIAL *(Check One)*	
	Appendix G Rules Followed; or
X	Equivalent Rules Attached
16. EMERGENCY PROCEDURES *(Check One)*	
	Appendix H Procedures Followed; or
X	Equivalent Procedures Attached
17. AREA SURVEY PROCEDURES *(Check One)*	
	Appendix I Procedures Followed; or
X	Equivalent Procedures Attached
18. WASTE DISPOSAL *(Check One)*	
	Appendix J Form Attached; or
X	Equivalent Information Attached
19. THERAPEUTIC USE OF RADIOPHARMACEUTICALS *(Check One)*	
	Appendix K Procedures Followed; or
X	Equivalent Procedures Attached
20. THERAPEUTIC USE OF SEALED SOURCES	
	Detailed Information Attached; and
	Appendix L Procedures Followed; or *(Check One)*
X	Equivalent Procedures Attached
21. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE GASES (e.g., Xenon – 133)	
	Detailed Information Attached
22. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL IN ANIMALS	
	Detailed Information Attached
23. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b	
	Detailed Information Attached

24. PERSONNEL MONITORING DEVICES

TYPE (Check appropriate box)			SUPPLIER	EXCHANGE FREQUENCY
a. WHOLE BODY	X	FILM	R.S. LANDAUER,JR. & CO.	Monthly
		TLD		
		OTHER (Specify)		
b. FINGER	X	FILM	R.S. LANDAUER, JR. & CO.	Monthly
		TLD		
		OTHER (Specify)		
c. WRIST		FILM		
		TLD		
		OTHER (Specify)		

d. OTHER (Specify)

25. FOR PRIVATE PRACTICE APPLICANTS ONLY

a. HOSPITAL AGREEING TO ACCEPT PATIENTS CONTAINING RADIOACTIVE MATERIAL

NAME OF HOSPITAL

MAILING ADDRESS

CITY | STATE | ZIP CODE

b. ATTACH A COPY OF THE AGREEMENT LETTER SIGNED BY THE HOSPITAL ADMINISTRATOR.

c. WHEN REQUESTING THERAPY PROCEDURES, ATTACH A COPY OF RADIATION SAFETY PRECAUTIONS TO BE TAKEN AND LIST AVAILABLE RADIATION DETECTION INSTRUMENTS.

26. CERTIFICATE

(This item must be completed by applicant)

The applicant and any official executing this certificate on behalf of the applicant named in Item 1a certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Parts 30 and 35, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

a. LICENSE FEE REQUIRED
(See Section 170.31, 10 CFR 170)

(1) LICENSE FEE CATEGORY:

(2) LICENSE FEE ENCLOSED: $ 40.00

b. APPLICANT OR CERTIFYING OFFICIAL *(Signature)*

(1) NAME *(Type or Print)*
Tom Rine

(2) TITLE
Executive Director

c. DATE
12/8/83

60146

NRC FORM 313M (9-81)

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 313M. 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 30-36 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 used: (a) to provide records to State health departments for their information and use; and (b) to provide information 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 a NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you. A copy of the license issued will routinely be placed in the NRC's Public Document Room, 1717 H Street, N.W., Washington, D.C.

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.

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

RADIATION SAFETY COMMITTEE

Responsibilities: The radiation safety committee should review procedures for uses, storage, disposal and transport of radioisotopes, set up guidelines to nursing staff handling patients administered with radionuclides and address all other relevant areas. The committee should ensure that all individuals who work with, or in the vicinity of, radioactive materials have the education and experience to perform safely and in accordance with regulations and license conditions. The committee should ensure that all radioactive material usage is done safely and in accordance with regulations and license conditions.

Specific Duties: The committee members should:

1. Familiarize themselves with pertinent regulations, license terms and documents submitted in support of the request for the license and its amendments.

2. Determine sufficiency of training and experience of all personnel who use radioactive material to perform their duties safely and in accordance with regulations and license conditions. Personnel includes physicians, technologists, physicist, pharmacists, and all other appropriate individuals.

3. Develop an educational program to ensure all personnel required to work in the vicinity of radioactive material are properly instructed to perform in a safe manner.

4. Review and approve requests for radioactive material usage within the institution and prescribe special conditions for usage of the materials. These conditions might include bioassay requirements, physical examinations of users, and monitoring procedures.

5. On an annual basis, review the radiation safety program to ensure all activities are safely conducted and in accordance with regulations and license conditions. The review should include record examination, radiation safety office reports, inspection results, written safety procedures and the institution's management control system. The committee should recommend remedial action for noted deficiencies.

6. Establish a program to ensure occupational radiation exposures will be as low as reasonably achievable.

7. Document the names and qualifications of committee members, updating the information as necessary. Members should be added as needed.

8. Ensure all radioactive material license is amended when necessary as specified in the license.

Committee Composition: The committee membership roster should include:

1. Radiation Safety Officer who has at least 200 hours of radiation safety training.

2. Chief Nuclear Medicine Physician.

3. Chief Radiologist.

4. Representative from nursing staff.

5. Representative from the institution's management.

6. An authorized user for each type of radioactive material permitted by the license.

7. Other members as determined by the institution's unique needs.

Meeting Frequency: The committee should meet at least once per calendar quarter and more often if necessary to conduct its business. Minutes of the meetings should be recorded and kept in the Nuclear Medicine Department.

Alex Spinos, Assistant Administrator
J.P. Reimer, M.D., R.S.O.
Jerry Shaver, R.T., Chief Radiology Technologist
Vito Fuentes, A.S.C.P., Chief Nuclear Medicine Technologist
Carol Brown, R.T., Radiation Therapy
Floyd Vancel, R.N., Nursing Director
Frank Marcotte, Housekeeping Director

Radiation Safety Committee:

Radiation Safety Committee:

A Radiation Safety Committee (RSC) should be established. The committee should meet on a quarterly basis and minutes of these meetings should be maintained.

Radiation Safety Committee Structure:

The Radiation Safety Committee should be composed of representatives of all departments in which personnel work directly or indirectly with radiation. This includes representatives from radiology, nuclear medicine, nursing, housekeeping, administration, quality control committee, etc. The chief radiology technologist as well as the chief nuclear medicine technologist must be members of the committee. Refer to Section II--Standard #24 form, Page 37.

Radiation Safety Committee Responsibilities:

The Radiation Safety Committee should review procedures for uses, storage, disposal, and transport of radioisotopes, set up guidelines to nursing staff handling patients administered with radionuclides, and address all other relevant areas. The committee should ensure that all individuals who work with or in the vicinity of radioactive materials have the education and experience to perform safely and in accordance with regulations and license conditions. The committee should also ensure that all radioactive materials usage is done safely and in accordance with regulations and license conditions. Refer to Section II--Standard #25 policy and procedures, Pages 38 and 39.

Radiation Detection Instrument:

Appropriate radiation detection instruments must be kept maintained and used at the Nuclear Medicine facility. A survey meter of the Geiger counter type with a thin end window probe and an audible signal with the visual indication in millirems/hour is necessary. The meter at its lowest scale end must read in hundredths of millirems. (A typical example of this is the Ludlum GM Survey Meter Model 14C.) If therapy is performed at the facility, there must also be an ionization chamber that will read in ranges of millirems to rems per hours with an integrated mode for recording radiation. (For example, a Victoreen Survey Meter Model 471 meets this requirement.) A back up instrument must be available for use during calibration or repair of the primary instrument.

Radiation Detection Instrument Documentation:

A survey meter logbook must be maintained for each survey meter. This logbook should include all the manufacturer's information available and results of the daily operational checks. A reference check source of a long half life (e.g., Cs-137) should read as follows:

1. Before each use and also after each survey to ensure that the instrument was operational during the survey.

2. After each maintenance and/or battery change.

3. At least quarterly.

Once each working day, a battery and audio check should be made of the instruments. This information should be recorded in the log. If there are no examirations during the day, this should also be noted in the log. Refer to Section II--Standard #50 policy and procedure, Page 80, and Standard #50 form, Page 81.

Survey Meter Operation:

The survey meter should be checked each time it is used for proper operation. A small sealed source attached or unattached to the meter is suitable for this operational check. The same geometry of detector to source must be used each time for the operational check.

Performance Evaluation:

The survey meter should have its performance evaluated twice a year. This will be performed by Radiation Safety Services. Refer to Section II--Standard #52 form, Page 82.

CAPINTEC INSTRUMENTS, INC.

REPORT OF CALIBRATION

Radioisotope Dose Calibrator

Model: CRC-4

Serial Numbers

Set: 41122

Chamber: R2093

Meter: 625233

Power Supply Tested ✓

Iometer Tested ✓

Bias Battery Tested ✓

Calibration

Calibration standards used for Instrument Calibration.:

Radionuclide	Activity	Accuracy	Instrument Reading
Co-57	1771 µCi	±1.9 %	set*
Co-60	2267 µCi	±1.8 %	set*
Cs-137	822.9 µCi	±2.3 %	832 µCi
Ra-226	104.0 µCi	±0.5 %	102.1 µCi

* Co-57 and Co-60 standards are used to normalize the instrument response.

#10
October 3, 1983

601446

LINEARITY TEST

Linearity of the chamber is tested by comparing the ratio of chamber outputs for high activity and low activity Tc-99m samples to that from the standard chamber.

✓ < 5% saturation at 2 Ci

_____ > 5% saturation at 2 Ci

REMARKS

Date: 4-12-83

R. Kundelberger
Test Engineer

#10

CALIBRATION OF DOSE CALIBRATOR

Because a dose calibrator is used to assay the activity of all radiopharmaceuticals, the instrument must be checked for accuracy. Testing should be done at installation and then periodically. The schedule for testing may vary with equipment repair because, depending upon the nature of the repair, some tests will need to be performed after repair.

Tests to be performed include:

I. At Installation

   a. Instrument Accuracy
   b. Instrument Linearity
   c. Geometry Variation

II. Semi-Annual

   a. Instrument Accuracy (to be done by RSS)

III. Quarterly

   a. Instrument Linearity

IV. Daily

   a. Instrument Constancy

Facility: _____ Date: _____

Manufacturer: _____ Technologist: _____

Model #: _____ Serial #: _____

DOSE CALIBRATOR GEOMETRIC VARIATION TEST WORKSHEET

Volume Measured	Activity Recorded	Date and Time
1.0cc		
2.0cc		
4.0cc		
8.0cc		
10.0cc		
20.0cc		
25.0cc		

Technologist:

Volume Measured	Activity Recorded	Date and Time
1.0cc		
2.0cc		
4.0cc		
8.0cc		
10.0cc		
20.0cc		
25.0cc		

Technologist:

Standard #43, Page 12 Form

Radiation Safety Services

60146
#10

DOSE CALIBRATOR ACCURACY TEST (ENERGY LINEARITY)

The dose calibrator should be checked quarterly for accuracy for several radionuclides of various energies, such as Co-57, Ba-133, and Cs-137. These sources must be NBS traceable and contain activity levels similar to those clinically used: 3-5 mCi of Co-57, 200-300 uCi of Ba-133, and 100-200 uCi of Cs-137. The standards should be of vial E configuration and color-coded. The procedure to be used is:

1. Assay the standard at the appropriate setting. Subtract background to obtain net activity.

2. Repeat three times for each standard. Take the average of the three readings for each radionuclide and record.

3. The average activity should agree to ±5 percent after decay corrections have been made. Any values outside of ±5 percent indicate the instrument is in need of repair. If this is not possible, a correction factor must be used for routine assays of radionuclides in the energy range found to be out of calibration.

Standard #44, page 13
Radiation Safety Services

#10

SAMPLE LOG

Dose Calibrator Accuracy Test (Energy Linearity)

Date	Calculated Activity Cs-137	Net Activity Cs-137	% Variation	Calculated Activity Ba-133	Net Activity Ba-133	% Variation	Calculated Activity Co-57	Net Activity Co-57	% Variation

72

Standard # 44, Page 13 Form
Radiation Safety Services

DOSE CALIBRATOR CONSTANCY TEST

The constancy test is a check of the dose calibrator's ability to reproduce activity measurements of a long-lived reference source over a period of time. Each day this test must be performed with at least one source, such as Cs-137 or Ra-226. The following procedure may be used to perform the constancy test:

1. Assay each reference source using the appropriate instrument setting (i.e., Cs-137 setting for Cs-137).

2. Measure background at the same setting.

3. Calculate net activity by subtracting out the background measurement.

4. Log results of background and activity measurements. Also include the predicted activity of the source based upon decay calculations.

5. Repeat the procedure for all other commonly used radionuclide settings. Log results.

6. If variations greater than ±5 percent occur, the dose calibrator is in need of adjustment or repair.

SAMPLE LOG

Dose Calibrator Constancy Test

Date	Radionuclide	Predicted Activity	Net Activity Measured:					
			Cs-137	Tc-99m	I-131	Xe-133	I-123	Tl-201

Standard #45, Page 13 Form

DOSE CALIBRATOR LINEARITY TEST

The linearity of a dose calibrator should be tested at installation and quarterly thereafter. The purpose of the following procedure is to measure net activity versus calculated activity to determine need for instrument repair.

Materials: 1. High activity source of Tc 99m equivalent to the maximum anticipated to be assayed. This source may be the first elution from a new generator. If you do not use a generator, your local Radiopharmacy should be able to provide you with a source to meet your needs. 2. Four-cycle semi-logarithmic graph paper.

Procedure:

1. Assay the Tc 99m vial in the calibrator, subtract background level to obtain net activity in millicuries. Record the time and activity.

2. Repeat step 1 at time intervals of 6, 24, 30, and 48 hours after the initial assay.

3. Using the 30-hour activity measurement, calculate the activity that should have been present at the other measurements using the following table:

Assay Time (hr)	Correction Factor
0	32
6	16
24	2
30	1
48	0.125

Example: If the net activity measured at 30 hours was 15.625 mCi, the predicted activity for 6 and 48 hours would be 15.625 mCi x 16 = 250 mCi and 15.625 mCi x .0125 = 1.95 mCi, respectively.

4. Plot the activity for each time interval versus the predicted activity on the log paper.

5. The activities plotted should be within +5% of the predicted curve if the calibrator is performing in an acceptable linear manner and functioning properly.

60146 #10

6. Errors greater than +5% indicate the need for repair or adjustment of the calibrator. A shift of the curve in the region of range change when going from millicuries to microcuries indicates a misadjustment of the range selector. The repairman should be notified of these problems, and adjustment should be made using the NRC guide or equivalent methods.

Radiation Safety Instruments
1224 Contra Costa Blvd.
Pleasant Hill, CA 94523

Calibration Certificate

This is to certify that Pres.Rad.Instr. (mfg.), G.M. Counter (type) # 107-C (model), SGM 49-C (ser. no.) was calibrated on Sept. 30, 1982 (date). This instrument now meets the manufacturer's tolerance of ± 7.5 % F. S. The source used for calibration CS-1495 (no.) is traceable to NBS. The isotope used was ^{137}Cs. The instrument was calibrated at an ambient temperature of 60-80°F and includes a background reading of 0.02 mR/hr.

Calibration is performed in accordance with recommendations of the U. S. Nuclear Regulatory Commission[1], State of California Regulations[2], International Commission on Radiation Protection, and the International Commission on Radiation Units[3].

A two point calibration check was made on each range/scale, one point in the lower 25% of the range/scale, and one point in the upper 25%. Adjustments have been made so that the instrument conforms to the above stated accuracy on all ranges when compared to true dose rate, unless otherwise noted.

Comments: _____

Calib.# 2508

Calibration Technician: _____

Approved by: _____

Dated: 9-30-82

Ref: (1) U. S. Nuclear Regulatory Commission RG8.2. Section 1.12
(2) California Adm. Code, Title 17, Section 30332 c-1.
(3) International Commission on Radiation Units, ICRU-20.

#10
October 3, 1983
60146

RADIATION DETECTION COMPANY
162 Wolfe Road • P.O. Box 1414 • Sunnyvale, California 94088 • (408) 735-8700

CALIBRATION OF SURVEY INSTRUMENT

Report Number 4

Made For: Southwest Hospital Inc.
Attn: Mr. Jerry Shaver
401 Lee Blvd.
Lawton, OK 73501

Purchase Order No. 412001

Calib. Date: April 18, 1983

Instrument Don L. Collins Model # CP-3A Serial # 552

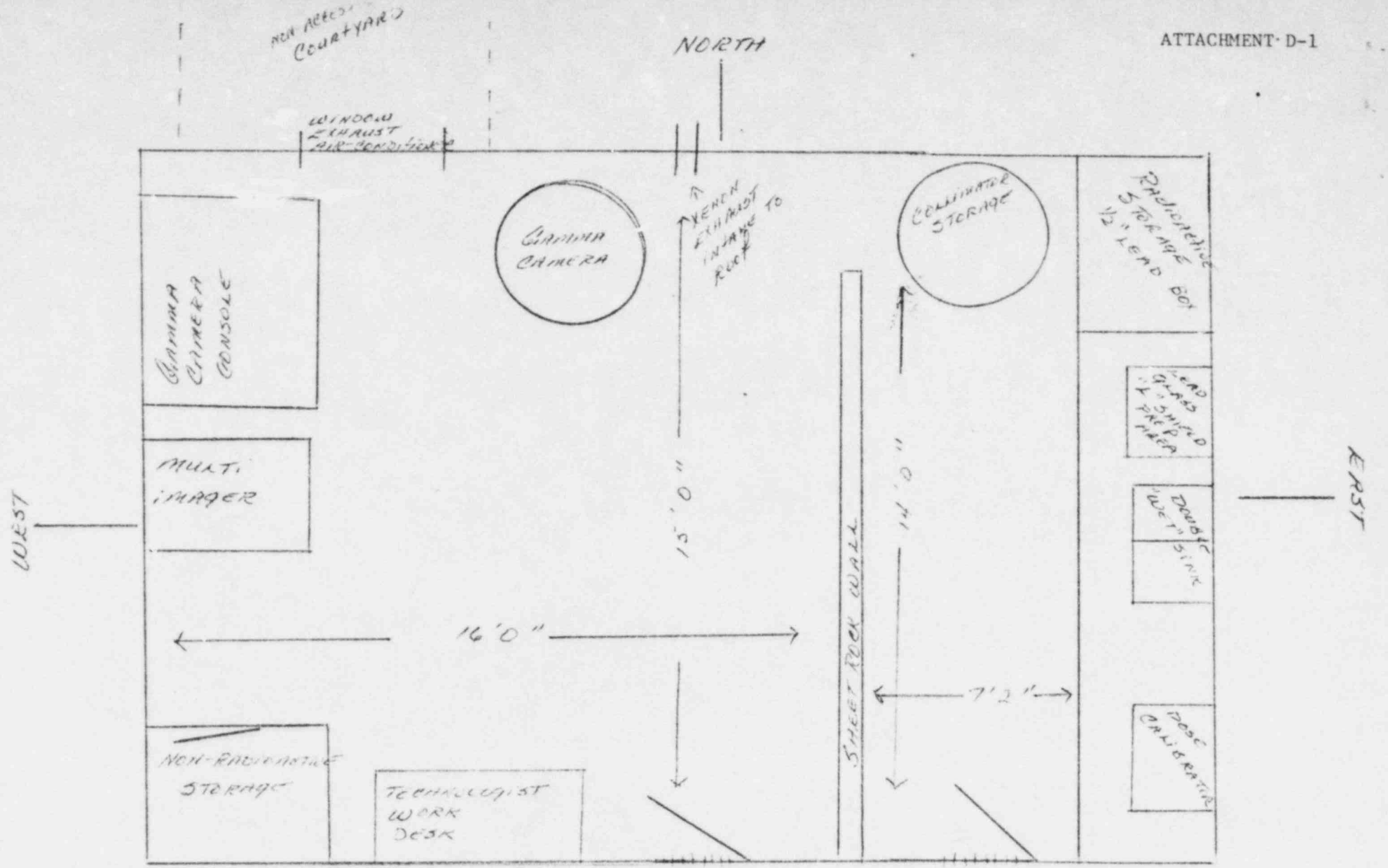
Exposure mR/hr	Instrument Reading mR/hr	Instrument Scale
2,000	2,000	X100
1,000	1,000	X100
500	500	X100
200	195	X10
100	100	X10
50	50	X10
20	18	X1
10	10	X1
5	5.5	X1

Notes: Calibrated with Co-60 and Ra-226.

Gamma ray calibrations are made with Radium, Cobalt 60 and Cesium 137. A complete record of each instrument calibration is maintained in our files, battery checks and routine preventive maintenance are also included as a part of the calibration procedure.

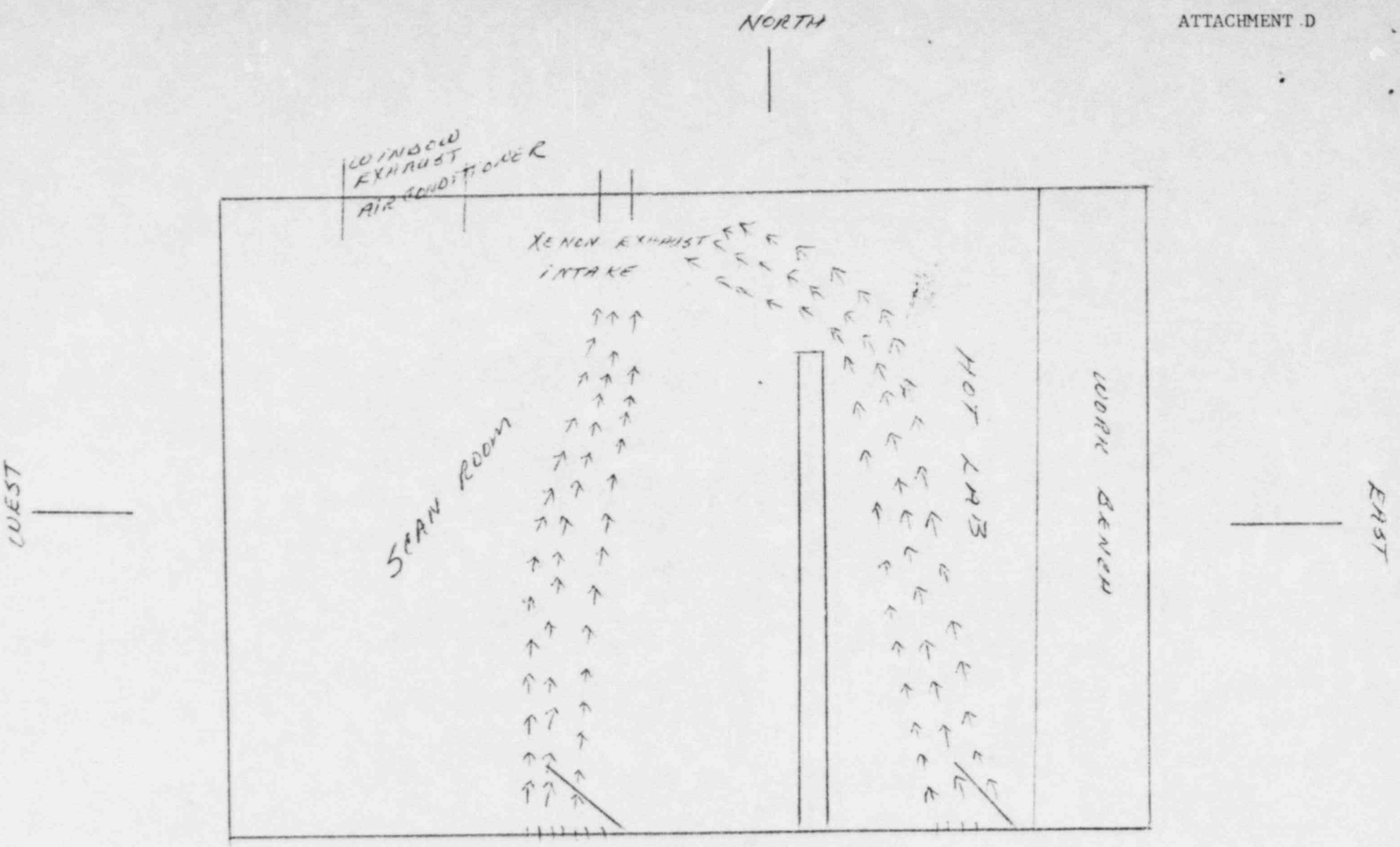
Next Calibration Due _____ Calibrated By _____

ATTACHMENT D-1



#11
October 3, 1983

Southwestern Hospital
Nuclear Medicine Facility



#11
October 3, 1983

DIRECTION OF AIR FLOW FOR XENON EXHAUST SYSTEM IS INDICATED BY ARROWS.

EXPECTED PATIENT LOAD IS 50-75 EXAMS PER YEAR.

FAN TYPE GENERAL AIR FLOW PUSH-PULL

R. Fuentes, N.M. (A.S.C.P.) C.N.M.T.

NUCLEAR MEDICINE PROFILE

Staff

Nuclear medicine technologists work under the direction of a physician who is qualified in nuclear medicine. They assist or operate the scanning device, make calculations for in vivo studies, and handle the storage and disposal of nuclear material. A nuclear medicine technologist undergoes a one- or two- year training program. Most two-year programs require a high-school diploma. One-year programs are open to college graduates who have had some science courses or to registered nurses, radiologic technologists and medical technologists. Graduates of accredited programs in nuclear medicine technology can apply for certification from the American Registry of Radiologic Technologists (ARRT), the Board of Registry of the American Society of Clinical Pathologists (ASCP) or the Nuclear Medicine Technology Certification Board (NMT).

#12
October 3, 1983

RADIOACTIVE MATERIALS RECEPTION--DELIVERY

During working hours, carriers should be told to deliver all radioactive packages directly to the Nuclear Medicine Department. It must be signed by designated personnel.

During off-duty hours, the security personnel or other authorized institution personnel should accept delivery of the radioactive package. Acceptance of the package should follow specified procedure as outlined below.

Authorized personnel should:

1. Visually inspect package; if wet or damaged, ask carrier to remain. Call Radiation Safety Officer or his designee who will determine if carrier or delivery vehicle is contaminated. If the package is not wet or damaged, the authorized personnel should proceed to Step #2.

2. Sign for package.

3. Take the package to the Nuclear Medicine Department. Unlock the Nuclear Medicine Department door. Set package on a specified counter. Relock the Nuclear Medicine Department.

4. Incoming radioactive materials should never be left at reception desk or a nurses station at any time.

U.S. NUCLEAR REGULATORY COMMISSION REGULATORY GUIDE APPENDIX E

Procedures for Ordering and Accepting Delivery of Radioactive Material

1. The Supervisory Nuclear Medicine Technologist will place all orders for radioactive materials and will ensure that the requested materials and quantities are authorized by the license and that possession limits are not exceeded.

2. A system for ordering and receiving radioactive materials will be established and maintained. The system will consist minimally of the following:

a. Ordering of routinely used materials:

(1) Written records that identify the isotope, compound, activity levels, and supplier, etc., will be used.

(2) The written records will be referenced when opening or storing radioactive shipment.

b. Ordering of specially used materials (e.g., therapeutic uses):

(1) A written request* will be obtained from the physician who will perform the procedure.

(2) Persons ordering the materials will reference the physician's written request when placing the order. The physician's request will indicate isotope, compound, activity level, etc.

(3) The physician's written request will be referenced when receiving, opening, or storing the radioactive material.

c. It is essential that written records* be maintained for all ordering and receipt procedures.

3. During normal working hours, carriers will be instructed to deliver radioactive packages directly to the Nuclear Medicine Department.

4. During off-duty hours, security personnel or other designated individuals will accept delivery of radioactive packages in accordance with the procedures out-lined in the sample memorandum below.

---

*In the case of special orders, the physician's written request and appropriate shipping/receipt records will be referenced and the dose assayed prior to its administration.

MEMORANDUM TO AUTHORIZED PERSONNEL REGARDING RECEIPT OF RADIOACTIVE MATERIAL DURING OFF-DUTY HOURS

To: NURSING DIRECTOR

From: NUCLEAR MEDICINE

In the event that radioactive materials are delivered to the institution between 5:00 p.m. and 9:00 a.m. weekdays, or between 12:00 p.m. and 11:00 a.m. Saturdays or Sundays, notify the NURSING SUPERVISOR on duty to expedite the delivery.
(Position of Authorized Personnel)

Instructions:

1. Authorized personnel should visually inspect package before signing for it. If it is wet or damaged, the authorized personnel should contact the Radiation Safety Officer or his designee immediately and ask the carrier to remain. The RSO will inspect the carrier and delivery vehicle for contamination.

Radiation Safety Officer: J. P. REIMER, MD

Home Phone: 536-5488 Office Phone: 355-0585

If the package appears undamaged, the authorized personnel should sign and deliver the package to the Nuclear Medicine Department. He should unlock the door, set the package at THE CENTER OF THE RM, and relock the door.
(Location)

Standard #26, Page 10
Radiation Safety Services

#13
60146

RADIOACTIVE MATERIALS RECEPTION--INSPECTION

NOTE: Inspection procedures of all radioactive materials to be done within three hours of delivery if received during working hours or within 18 hours if delivered after working hours. Special requirements will be followed for packages containing quantities of radioactive material in excess of the Type A quantity limits as specified in paragraphs 20.205(a)(1) and (c)(1) of 10 CFR Part 20 (more than 20 Ci for Mo-99 and Tc-99m). They will be monitored for surface contamination and external radiation levels within 3 hours after receipt if received during working hours or within 18 hours if received after working hours, in accordance with the requirements of paragraphs 20.205(a) through (c). All shipments of liquids greater than exempt quantities will be tested for leakage. The NRC Regional Office will be notified in accordance with the regulations if removal contamination exceeds 0.01 uCi/100cm^2 or if external radiation levels exceed 200 mR/hr at the package surface or 10 mR/hr at three (3) feet (or 1 meter).

Ring-type dosimeters should be worn with the detector turned toward the radioactive source before donning gloves. Gloves must be worn at all times when handling any radioactive material. Remove control devices, such as forceps, should be used whenever possible. Throughout procedure, gloves should be checked for contamination before picking up a pen for recording purposes.

Procedure

1. Put on disposable gloves and wear laboratory coat or other protective clothing. The personnel dosimeter should be worn at collar level.

2. Visually inspect package for signs of damage. If package is crushed or wet, notify the RSO immediately and stop procedure. If possible, do not directly handle the package--use remote handling devices.

3. Measure external radiation level of package:

a. Place survey meter detector 1 meter (3 feet) away from source.

b. Measure the exposure rate and record data. (Note: Check for glove contamination before picking up pen.)

4. Measure package surface external radiation level:

a. Place dosimeter 1" from package surface.

b. Measure the surface exposure rate and record data. (Note: Check for glove contamination before picking up pen.)

5. Determine background exposure and record. (Note: Check for glove contamination before picking up pen.)

6. Utilizing cotton swabs and forceps, wipe package thoroughly (area wiped should be 100 cm^2 or greater).

7. Place cotton swab into a glove, tie glove, and place in front of a thin end-window G.M. Probe and measure.

8. Record results of outer wipe test in Radioactive Material Reception Log.

9. Open outer package following any instruction supplied by the manufacturer.

10. Remove packing slip. Compare requisition, packing slip, and bottle label to make certain order was correctly filled.

11. Check that order does not exceed possession limits.

12. Visually inspect final or preliminary source container for seal or vial breakage, liquid loss, or package material discoloration.

13. Perform wipe test on primary source container using forceps and cotton swab. (Wipe area of 100 cm^2 or as near as possible.)

14. Deposit swab into glove, tie glove. Repeat Step 7.

15. Record primary container results for all radiopharmaceuticals.

---

16. For all sealed or Brachytherapy sources, forward tied glove with wipe inside to Radiation Safety Services for testing and certification.

17. Monitor packing material for contamination.

a. If contaminated, treat as radioactive waste.

b. If not contaminated, destroy radiation labels and discard in general trash.

#1 14

18. Record all results of package checking and final container in Receiving Reports. (Note: Check for glove contamination before picking up pen.)

19. Store radioactive materials in appropriate container, identified and labeled with compound name, radionuclide, date, activity, and radiation level if applicable.

20. Remove gloves. Wash hands. Monitor gloves, hands, and clothing for contamination.

Radiation Safety

ALARA Commitment:

The ALARA commitment should be made and signed. A copy of the signed commitment should be kept on file in the nuclear medicine department. A copy of the ALARA program should be incorporated into the policy and procedure manual. Refer to Section II--Standard #62 supplementary literature, pages 109-115, and Standard #62 for, page 116.

Laboratory Coats:

Laboratory coats should be worn at all times when working with radioisotopes. They should be knee length, long-sleeved, and buttoned during work. The laboratory coats should be left in the work area when leaving the department. Lab coats should be monitored before leaving the work area and when they are laundered.

64. Disposable Gloves:

Disposable gloves should be worn at all times when working with radioisotopes. Hands should be washed and monitored after each procedure. Gloves should be frequently changed when working with radionuclides.

65. Absorbent Paper:

All working surfaces and transport devices (trays and carts) should be covered with absorbent paper coated on the reverse side with a nonpermeable plastic.

66. Spills:

All spills including those resulting from incontinence must be cleaned up immediately. Provision should be made for storage of contaminated linen.

67. Pipetting:

Pipetting should be done with mechanical devices and never orally.

68. Eating, Drinking, Smoking, Loitering, and Application of Cosmetics:

Eating, drinking, smoking, loitering, and application of cosmetics are prohibited in areas where radioactive materials are handled or stored.

69. Clean Procedures:

Procedures not requiring radioactive materials should not be performed in an area where radioactive materials are used.

70. Refrigerator:

The refrigerators used for storage of radioisotopes should not be used for food storage. In general, labeled material should be stored in the lower shelves.

71. Remote Handling:

Remote handling devices should be used whenever possible while handling radioactive materials, including all sealed sources.

72. Syringe Shield:

Syringe shields should be used. The preferred type of syringe shields are those made of lead glass.

#15

73. Vial Shields:

Vial shields should be used whenever necessary, particularly when handling eluates from Mo-99/Tc-99m generators.

74. Storage Shielding:

Adequate storage area should be provided for all radioisotopes. The storage area should be adequately shielded to protect laboratory workers and personnel working in the adjacent rooms.

75. Radioactive Waste Storage:

All radioactive waste should be stored in a properly shielded storage area. All used needles should be stored in a separate hardside container in the waste storage area to reduce the risk of skin puncture or contamination. Further, the needles should be clipped into the hardside container.

76. Waste Storage Posting:

All radioactive waste storage areas must be clearly posted with either "Caution! Radioactive Materials" or "Caution! Radioactive Waste Storage" signs. This includes closets, rooms, cabinets, drawers, waste baskets, laundry hampers, or other areas where materials are commonly stored. The signs should be clearly visible to any person in that area. Refer to Section II--Standard #12 sign, page 31.

77. Storage Mirrors:

A mirror should be positioned above the shielded storage area to avoid direct exposure to the eyes when the radiation field necessitates.

78. Lead Glass Shielding:

All bench top work areas should have at least one work area with a lead glass shield.

79. Patient Restrainers:

Occupationally exposed personnel should not be used to hold patients. Patient restrainers are commercially available and should be used.

80. Transportation of Radioactive Materials:

Radioactive materials should be transported in shielded containers lined with absorbent paper. The containers should be clearly posted with "Caution! Radioactive Materials." Refer to Section II--Standard #12 sign, page 31.

81. Housekeeping:

Housekeeping must be maintained in accordance with the standards of the Joint Commission on Accreditation of Hospitals, local safety and fire codes, and general tidiness.

82. Fourteen-Day Rule:

The fourteen-day rule should be implemented. All female personnel must notify their supervisor if they are pregnant or if their menstrual period is late by fourteen days. For suspected pregnancies, a pregnancy test should be made as soon as possible. Refer to Section II--Standard #82 letter, page 117.

83. Pregnant Personnel--Work Procedures:

A second body dosimeter should be acquired for pregnant personnel and it should be worn at midsection. The dosimetry company should be informed of the badge's purpose for proper record keeping. A wrap-around lead apron of 0.5 mm lead equivalent thickness should be worn or a portable shield should be used when working with radionuclides including imaging of patients. Dosimeters should be worn under aprons. Pregnant personnel should be restricted from therapeutic procedures and actual handling of volatile radioisotopes such as iodine and xenon. Pregnant personnel should not hold patients during exams and should minimize lifting and turning of patients. The hospital RSO and Radiation Safety Services should be notified to monitor the pregnant individual. The pregnant personnel should read the pregnancy advisory literature and document the fact she has done so. Refer to Section II--Standard #83 supplementary materials 1 and 2, pages 118 - 125, and Standard #83 letter, page 126.

84. ALARA Limit:

No exposure to pregnant personnel is allowed that is greater than 20 mrem/month during the pregnancy period. If this ALARA limit is exceeded, the exposure should be investigated by the Radiation Safety Committee to determine the cause and the corrective action to be taken.

#15

Dosimetry

85. Dosimetry:

Radiology departments are required by state, federal, and local regulatory agencies to monitor the radiation exposure of all occupationally exposed personnel. The maximum monitoring time allowed by the Joint Commission on Accreditation of Hospitals for all occupationally exposed personnel is 30 days. Anyone who is routinely exposed to radiation during the production of x-rays in the x-ray department, O.R., or E.R. should wear a dosimeter. Policies should be written and implemented governing the use of dosimeters and records maintained pertaining to dosimeters. Refer to Section II--Standard #85 policy and procedure, pages 127 - 129.

86. Previous Dosimetry:

The previous lifetime radiation exposure records of all new employees should be acquired from the previous employer(s) and kept as part of the permanent file of that employee. A copy of that exposure record should also be sent to the dosimetry company used by the facility with the request to add the previous lifetime exposure record of the new employee to his current exposure record. Refer to Section II--Standard #86 letters 1 and 2, pages 127 and 128.

87. Concurrent Dosimetry:

When an employee is also concurrently employed by another employer and exposed to radiation in the other position, a monthly copy of their radiation exposure should be acquired by the employee and given to this facility. This should be made part of the employee's permanent file. In the event of legal action by the employee or their heirs, the exposure records of that employee at another facility would be extremely important. Refer to Section II--Standard #87 letter, page 129.

88. Dosimetry Record Retention:

OSHA requires the retention of all personnel exposure records for 30 years. It is recommended that all exposure records be kept indefinitely. The latency period of cancer is the lifetime of the individual.

89. Dosimetry Record Omission:

In the event that an employee loses their personal dosimeter, the omission in the permanent record should be footnoted and a written explanation of the omission, signed by the Radiation Safety Officer of the facility should be placed with the permanent record. If the employee's routine has not varied during this work period, this should be so stated in the missile. Refer to Section II--Standard #89 letter, page 130.

90. Dosimetry for Non-Inservice Personnel or Persons:

All non-inservice personnel or persons should wear dosimetry if they are present during the production of x-rays or gamma-rays. The above is satisfied for non-routine exposure by the use of a self-reader dosimeter. The results should be documented in a permanent record. The date, person's name, social security number, why they were present, the amount of the exposure, The dosimeter serial number, and the dosimeter reader's name should be recorded. This log should be kept indefinitely as it becomes a legal record during any subsequent legal action. This is important for all persons holding during an x-ray examination such as the mother, father, or any non-occupationally exposed personnel. Refer to Section II--Standard #88 form, page 131.

91. Dosimetry Wearing Procedures:

All occupationally exposed personnel must wear body dosimetry. The dosimeter should be worn at collar level. If a lead apron is worn, the dosimetry should be worn outside the lead apron. The dosimeter detector should always be in a position closest to the direct beam and unshielded. Refer to Section II--Standard #85 policy and procedure, pages 127 - 129.

92. Appropriate Dosimetry:

All physicians or technologists should wear finger dosimetry on each index finger if they work with radioisotopes. If the examination requires aseptic conditions, then wrist dosimetery should be worn in lieu of finger rings. This is particularly important during generator elution and preparation, assay, and injection of radiopharmaceuticals. Refer to Section II--Standard #85 policy and procedure, pages 127 - 129.

93. Dosimetry for Pregnant Personnel:

All pregnant personnel should have two body badges. One to be worn at collar level, outside of any lead apron worn, and the other worn in the mid-body region covered by the apron when a lead apron is worn. The dosimetry company must be told the purpose of the dosimetry so that they will not integrate the results. Refer to Section II--Standard #93 letter, page 132.

94. Area Dosimetry:

An area dosimeter should be placed above the isotope preparation area in order to maintain a permanent record of the radiation field levels.

95. Dosimetry Storage:

A convenient, low-background area should be chosen to mount a storage rack for personnel dosimetry. Dosimetry must be left there at all times when they are not being used by the occupationally exposed personnel. The dosimetry must be left on the storage rack when not in use at the hospital. Dosimeters must never be taken home or worn to record radiation received during a personal medical examination.

96. Dosimetry Storage O.R. or E.R.:

A convenient, low-background area should be chosen to mount a dosimetry storage rack in O.R. and/or E.R. when circumstances merit it. In that event, the head nurse, or their assistant should be responsible for the dosimetry. The dosimetry must be left on the storage rack when not in use at the hospital.

97. Control Dosimetry:

A control dosimeter must be kept on the dosimetry storage rack at all times. The exposure recorded on the control dosimeter is subtracted from the personnel dosimeters by the dosimetry company. In the event that there is more than one storage rack in the facility, then a control dosimeter should be placed on each rack.

A15

98. Dosimetry Review Yearly:

Once each year all occupationally exposed personnel should review their dosimetry record for the previous year and document this fact. A letter signed and dated by the employee and stating that they had reviewed their dosimetry for the previous year should be kept as a permanent legal document. Refer to Section II--Standards #98 and 101 letters, pages 134 and 135.

99. Dosimetry Review Monthly:

Copies of the monthly dosimetry records should be sent to Radiation Safety Services for their monthly review and any action if necessary.

100. Authority Notification:

If an individual has received an exposure that exceeds the legal limit, then immediate notification must be made in writing to the appropriate authority. This should be delayed until determinations have been made that it is a real exposure. Contact Radiation Safety Services immediately for their aid in making this determination.

101. Personnel Notification:

Within 30 days of any whole body exposure that exceeds the legal limits, 1.25 rem/quarter or 5 rem/year, then the individual must be notified in writing that they have received an overexposure. This letter should be sent upon the conclusion of the investigation and the determination that a real exposure has occurred. The individual should monitor his dosimeter records each month for the six months following the overexposure and document he has reviewed these records. The original of the documentations should be retained in the facility dosimetry records with a copy given to the individual. Refer to Section II--Standards #98 and #100 letters, pages 134 and 135.

EMERGENCY PROCEDURES DURING RADIATION ACCIDENTS.

Contamination Control and Decontamination Procedures

Accidental spills of radioactive material may occur in any nuclear medicine laboratory, in any hall during transportation of radioactive material, and in any room or ward. The purpose of these procedures is to aid in the containment and decontamination of radioactive material from an area or a person after an accident has occured.

Radiation Accident Preparedness

1. Work safely and carefully. Know and follow the radiation safety rules of your facility. Use all safety equipment provided.
2. Only authorized personnel are to be allowed in the "Hot Lab", the imaging room, and/or the counting room at any time.
3. All persons working with radionuclides should wear waterproof gloves, a fully buttoned laboratory coat, and personnel dosimetry.
4. Make certain the portable radiation detection instrument is in good condition before commencing work with radionuclides, and leave the instrument on during the work.
5. Prior to and immediately following radioactive material use, the work area, the equipment, and the personnel should be monitored for contamination and radiation field levels.
6. Dose preparation and handling of unsealed radioactive materials should take place only in designated areas.
7. All work with radioactive materials should take place upon surfaces covered with plastic-backed, absorbent paper. All work with liquid radioactive materials should be done on trays covered with absorbent, plastic-backed paper.
8. Operations involving radioactive dusts, vapors, or gases should be carried on inside a hood.
9. No mouth pippeting, eating, smoking, application of cosmetics, or loitering should be allowed in the laboratory.
10. The waterproof gloves should be frequently changed and disposed of properly.
11. Laboratory coats should remain in the laboratory when not in use.
12. All personnel should be monitored thoroughly with the radiation detection instrument after dose preparation, patient dose administration, waste disposal, and before leaving the work area.
13. Hands should be washed after each use of radioactive materials.
14. Any unsafe condition or accident should be immediately reported to the proper authority.

Radiation Accident Response

First steps:

In the event of an accident or spill of radioactive materials, determine the radiation field level. If the field is above one rem per hour, clear the area immediately of all persons. Inform your Radiation Safety Officer of the accident. Stop traffic through the area. For further guidance, call Radiation Safety Services at (415) 676-0648 for 24-hour emergency advisory service. In general, the following steps for decontamination of areas with radiation fields of under 1 rem per hour can be followed.

If the radiation field is below 1 rem per hour, the following procedures can be used.

1. Notify all persons in the area that an accident has occured. Ask them to limit their movement to prevent spread of the contamination until they can be monitored.
2. Restrict access to the contaminated area.
3. Have all fans and ventilators operating in the area shut off, if possible, unless the room has negative air pressure.
4. Using the portable radiation survey meter, determine a clean area outside the contaminated field and clean pathways to that area for the persons in the accident area to follow. Have the persons in the contaminated area go to that designated area.

Personnel Monitoring

5. Using the portable radiation detection instrument (appropriate for the particular radionuclide involved), survey the person for contamination. Hold the detector 1 inch from the person and survey the hands, face, hair, shoes, and clothes. Do not touch the person with the detector. All personnel contamination must be reported to the Radiation Safety Officer.

Clothing Contamination

6. If contamination is found on the clothing, carefully remove the contaminated clothing and place it in a plastic bag. Close and tape the bag.

Hand Contamination

7. If contamination is found on the hands, thoroughly wash the hands with soap and water, but do not irritate or break the skin. Strong detergents and abrasive agents must not be used.
8. Dry the hands and remonitor with the survey meter.
9. If three washings fail to remove the contamination, contact the Radiation Safety Officer.

Face Contamination

10. If contamination is found on the face, wash with soap and water using a guaze pad, taking care not to spread the contamination.
11. If two attempts fail to remove the contamination, further action should be carried out under medical supervision.

Skin and Hair Contamination

12. If contamination is found on the body, shower or wash with warm water and soap, taking care not to spread the contaminated water.
13. If two attempts fail to remove the contamination, further action should be carried out under medical supervision.

Eye Contamination

14. If the eyes are contaminated, wash the eyes immediately under cold running water and seek immediate medical care.

Wound Contamination

15. Any wound received during work with radionuclides or in a contaminated area should be treated as contaminated.
16. Monitor the wound immediately and, if found to be contaminated, decontamination procedures should be started without delay. Obtain immediate medical care.
17. Minor wounds can be flushed with clear, running water. Care should be taken to prevent contamination from entering the wound from the surrounding skin.
18. Whenever a contaminated person is sent to surgery for further care, a written notice detailing the nature and amount of the contaminating isotope must accompany the person.

Inhalation Contamination

19. If inhalation contamination occurs, seek immediate medical care.

Area Decontamination

20. Follow instructions 1 to 5. If no personnel contamination has occured, proceed with the following.
21. Don rubber gloves, protective shoe coverings, a lab coat or surgical coveralls, and personnel dosimetry before commencing decontamination procedures.
22. Establish the borders and mark the outlines of the area contaminated.
23. After determining and marking the extent of the contamination area, establish a "clean" work area. This area is to be the interface between the contaminated area and the non-contaminated area. All materials to be used in decontamination and all protective clothing should be stored and, after use, bagged in this area. All clean-up waste bags should be stored in this area, etc. The decontamination kit should also be placed in this area.
24. Cover liquid spill with absorbent material to limit spread of contamination. This should be done immediately in the event of a liquid spill.
25. Start clean-up procedures at periphery of contaminated area and work inward, systematically reducing the contaminated area.
26. Put all contaminated solid material into plastic bags for disposal or later decontamination. Close and tape the plastic bags.
27. Wipe the contamination off surfaces using decontaminating agents and absorbent material. Change wiping material frequently. Take care not to spread the contamination.
28. Decontaminate the area as close to the background radiation level as possible. When the contamination is no longer removeable (the radiation field will show no reduction in strength after several cleanings of the contaminated area), contact the Radiation Safety Officer for the next steps to be taken.
29. Reduction of the radiation field to under 0.1 mrem per hour at the contaminated site for short half-life medical radionuclides (Te-99m, etc.) is in most cases satisfactory. Consult with the Radiation Safety Officer or the Health Physicist for the particular radionuclides in question.

NOTE:

The radiation detection instrument must be appropriate for the radionuclide(s) involved in the accident. For example, low energy beta emitters such as Tritium cannot be detected by most portable instruments. Contact Radiation Safety Services for further information in this area.

Radiation Emergency Call List

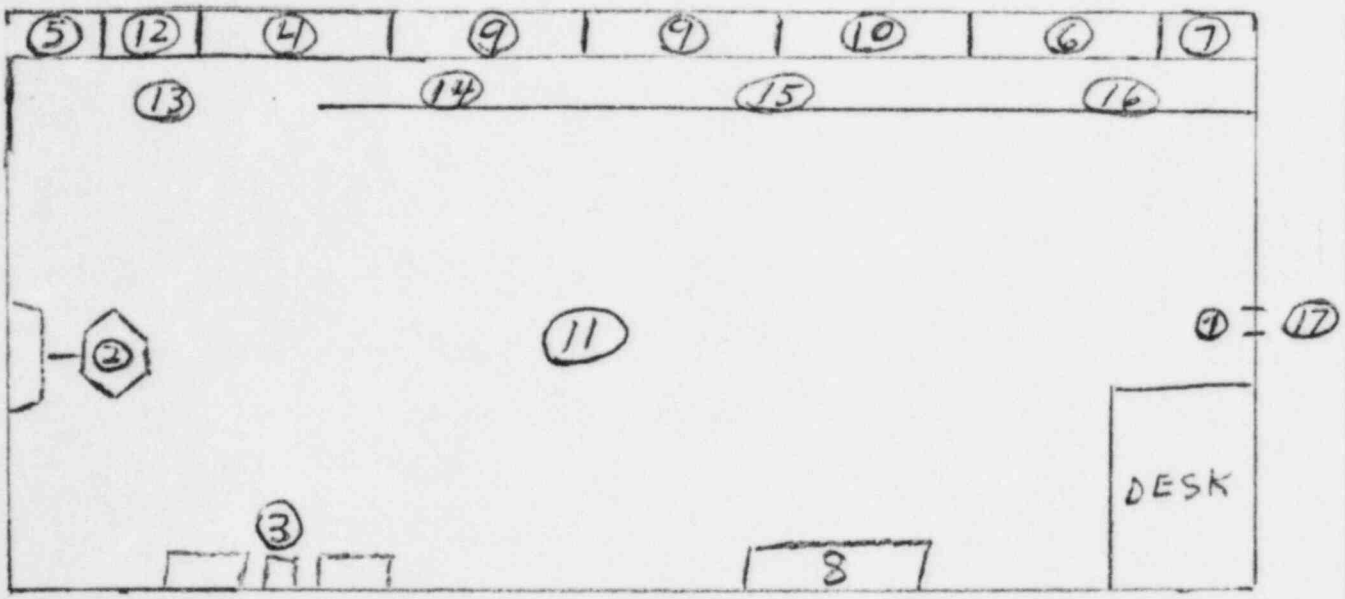
	NAME	TELEPHONE
RADIATION SAFETY OFFICER:		
MEDICAL AUTHORITY:		
STATE AUTHORITY:		
FEDERAL AUTHORITY:		
RADIATION SAFETY SERVICES:	Gene Crocker, Ph.D.	(415) 676-0648

Radiation Safety Services

1224 CONTRA COSTA BOULEVARD
PLEASANT HILL, CA 94523

#16
October 3, 1983

DATE: SURVEYOR: DEPARTMENT: NM



ITEM	LOCATION	DOSE-RATE (MREM/HR)	WIPE TEST*
1.	Main entry FLOOR	<.05	ϕ
2.	Camera	"	ϕ
3.	Camera Control	"	ϕ
4.	Work Bench	"	ϕ
5.	Storage Area	<1.0	ϕ
6.	Counting Area	<.05	ϕ
7.	Dose Calibrator	"	ϕ
8.	Collimator Storage	"	ϕ
9.	Sink	"	ϕ
10.	Refrigerator	"	ϕ
11.	Floor	"	ϕ
12.	Generator	<2.5	ϕ
13.	Floor	<.05	ϕ
14.	Floor	"	ϕ
15.	Floor	"	ϕ
16.	Floor	"	ϕ
17.	Surveyor	"	—

* ϕ = NO CONTAMINATION DETECTED

RADIATION PROTECTION PLAN

A record of the isotopes received and used will be recorded. An inventory of the isotopes will be kept. A disposable record of the isotopes is also kept. Liquid radiowaste will be disposed of in the sanitary sewage with the release not to exceed the standards set in the U.S. Atomic Energy Commission of Rules and Regulations, Title 10, Part 71. Solid radioactive material and waste will be isolated, marked and stored until it reaches background radiation. Radiation labels will then be removed and material disposed of in the normal trash.

In administration of the therapeutic isotopes, the radiation safety officers will notify the personnel of radiation protection and precaution, if necessary, handling of contaminated clothing or bed linen, the necessity of surveying the room following the patient's discharge or in advent of death, instructions for handling of the body.

#18
October 3, 1983

60146

RADIATION SAFETY PROCEDURES
FOR THE THERAPEUTIC USE OF RADIOPHARMACEUTICALS

General Instructions:

1. All patients treated with iodine-131, phosphorus-32, or gold-198 will be placed in a private room with a toilet. The room and toilet areas more likely to be contaminated will be covered with protective material as appropriate to the amount of contamination to be expected. Particular attention should be given to objects likely to be touched by the patient, e.g., telephones, doorknobs, and other items that would be difficult to decontaminate.

2. The patient's room will be properly posted in accordance with Section 20.203 of 10 CFR Part 20.

3. Surveys of the patient's room and surrounding areas will be conducted as soon as practicable after administration of the treatment dose. Exposure rates will be measured at various logical areas including, but not limited to, the patient's bedside, 3 feet away, 10 feet away, and at the entrance to the room. Maps will be made which will include the results of the initial and subsequent daily surveys. The Radiation Safety Officer or his designee will then determine how long a person may remain at these positions and will post these times on the patient's chart and on his door. The results of daily surveys will be used to recalculate permitted times, which will be posted on the patient's chart and on his door.

4. The form, Nursing Instructions for Patients Treated with Phosphorus-32, Gold-198, or Iodine-131, will be completed immediately after administration of the treatment dose. A copy will be posted on the patient's chart.

5. Radiation levels in unrestricted areas will be maintained less than the limits specified in paragraph 20.105(b) of 10 CFP Part 20.

6. All linens will be surveyed for contamination before being removed from the patient's room and, if necessary, will be held for decay.

7. Disposable plates, cups, eating utensils, tissue, surgical dressings, and other similar waste items will be placed in a specially designated container. The material will be collected daily by the Radiation Safety Officer or his designee, checked for contamination, and disposed of as normal or radioactive waste, as appropriate.

8. Nondisposable items used for these patients will be held in plastic bags in the patient's room and will be checked for contamination by the Radiation Safety Officer or his designee. Items may be returned for normal use, held for decay, or decontaminated, as appropriate.

9. Before a therapy patient's room is reassigned to another patient, the room will be surveyed for contamination, and decontaminated if necessary, and all radioactive waste and waste containers will be removed.

10. Nursing Staff Instructions:

a. Nurses should spend only that amount of time near the patient required for ordinary nursing care. Special restrictions may be noted on the precaution sheet on the patient's chart. Nurses should read these restrictions before administering to the patients. Call the Nuclear Medicine Department with any questions about the care of these patients.

b. Visitors will be limited to those 18 years of age or over unless other instructions are noted on the precaution sheet found in the patient's chart.

c. Patients must remain in bed while visitors are in the room and visitors should remain at least 3 feet from the patient.

d. Patients containing radioactive materials are to be confined to their rooms except for special medical or nursing purposes approved by the Nuclear Medicine Department.

e. No nurse, visitor, or attendant who is pregnant should be permitted in the room of a patient who has received a therapeutic amount of radioactivity until the patient no longer presents a radiation hazard. Female visitors should be asked whether they are pregnant.

f. Attending personnel should wear rubber or disposable plastic gloves when handling urinals, bedpans, emesis basins, or other containers having any material obtained from the body of the patient. Wash gloves before removing and then wash hands. The gloves should be left in the patient's room in the designated waste container. These gloves need not be sterile or surgical in type.

g. Disposable items should be used in the care of these patients, whenever possible. These items should be placed in the designated waste container. Contact the Radiation Safety Officer or his designee for proper disposal of the contents of the designated waste container.

60146
#19

h. All clothes and bed linens used by the patient should be placed in the laundry bag provided and should be left in the patient's room to be checked by the Radiation Safety Officer or his designee.

i. All nondisposable items should be placed in a plastic bag and should be left in the patient's room to be checked by the Radiation Safety Officer or his designee.

j. Surgical dressings should be changed only as directed by the physician. Gold-198 leaking from a puncture wound will stain the dressings dark red or purple. Such dressings should not be discarded but should be collected in plastic bags and turned over to the Radiation Safety Officer or his designee. Handle these dressings only with tongs or tweezers. Wear disposable gloves.

k. For iodine-131 patients:

(1) Disposable plates, cups, and eating utensils will be used by patients who are treated with iodine-131.

(2) Vomiting within 24 hours after oral administration, urinary incontinence, or excessive sweating within the first 48 hours may result in contamination of linen and floor. In any such situations or if radioactive urine and/or feces is spilled during collection, call the Radiation Safety Officer or his designee, Ext. _____. Meanwhile, handle all contaminated material with disposable gloves and avoid spreading contamination.

(5) Feces need not be routinely saved, unless ordered on the chart. The same toilet should be used by the patient at all times and it should be well flushed (3 times).

l. Utmost precautions must be taken to see that no urine or vomitus is spilled on the floor or the bed. If any part of the patient's room is suspected to be contaminated, notify the Radiation Safety Officer or his designee.

m. If a nurse, attendant, or anyone else knows or suspects that his or her skin or clothing, including shoes, is contaminated, notify the Radiation Safety Officer or his designee immediately. This person should remain in an area adjacent to the patient's room and not walk about the hospital. If the hands become contaminated, wash them immediately with soap and water.

n. If a therapy patient should need emergency surgery or should die, notify the Radiation Safety Officer or the Nuclear Medicine Department immediately.

60146

o. When the patient is discharged, call the Radiation Safety Officer or his designee or the Nuclear Medicine Department, and request that the room be surveyed for contamination before remaking the room.

Environment and Radioactive Sources

Sealed Source Inventory Log:

A logbook containing the information from the manufacturer, serial number, radioisotope, activity, and last assay date of all sealed sources should be kept. The logbook should also include the results of the periodic leakage tests carried out. Refer to Section II--Standard #30 form and instructions, pages 51 and 52.

Sealed Source Leakage Test:

Part of Radiation Safety Service's inspection is a leakage test for all sealed radioactive sources within the facility. These wipe tests will be measured by appropriate instrumentation in the laboratory of Radiation Safety Services. All sealed sources should be wipe tested when they are received from the manufacturer and the results documented in the Sealed Source Inventory Log. Refer to Section II--Standard #31 form and instructions, pages 51 and 52.

60146