

NRC FORM 313M (9-81) 10 CFR 35	U.S. NUCLEAR REGULATORY COMMISSION <b>APPLICATION FOR MATERIALS LICENSE – MEDICAL</b>	Approved by OMB 3150-0041 Expires 9-30-83			
<b>INSTRUCTIONS</b> – 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.					
1.a. NAME AND MAILING ADDRESS OF APPLICANT (institution, firm, clinic, physician, etc.) INCLUDE ZIP CODE  Internal Medicine Group of Cape Girardeau 14 Doctor's Park Cape Girardeau, Missouri 63701  TELEPHONE NO.: AREA CODE (314) 334 9641		1.b. STREET ADDRESS(ES) AT WHICH RADIOACTIVE MATERIAL WILL BE USED (If different from 1.a.) INCLUDE ZIP CODE  (Same)			
2. PERSON TO CONTACT REGARDING THIS APPLICATION  William E. Port  TELEPHONE NO.: AREA CODE (314) 334 9641		3. THIS IS AN APPLICATION FOR: (Check appropriate item) a. <input type="checkbox"/> NEW LICENSE b. <input type="checkbox"/> AMENDMENT TO LICENSE NO. _____ c. <input checked="" type="checkbox"/> RENEWAL OF LICENSE NO. 24-18814-01			
4. INDIVIDUAL USERS (Name individuals who will use or directly supervise use of radioactive material. Complete Supplements A and B for each individual.)  W. Kirk Bowman Jr., M.D. John Gantz, 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.)  W. Kirk Bowman Jr., M.D. with consultation from William J. Nalesnik, Ph.D.			
<b>6.a. RADIOACTIVE MATERIAL FOR MEDICAL USE</b>					
RADIOACTIVE MATERIAL LISTED IN:	ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)	ADDITIONAL ITEMS:	MARK ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)
10 CFR 31.11 FOR IN VITRO STUDIES			IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM		
10 CFR 35.100, SCHEDULE A, GROUP I		AS NEEDED	PHOSPHORUS-32 AS SOLUBLE PHOSPHATE FOR TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA AND BONE METASTASES		
10 CFR 35.100, SCHEDULE A, GROUP II	X	AS NEEDED	PHOSPHORUS-32 AS COLLOIDAL CHROMIC PHOSPHATE FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
10 CFR 35.100, SCHEDULE A, GROUP III *	X	2000 mCi	GOLD-198 AS COLLOID FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
10 CFR 35.100, SCHEDULE A, GROUP IV		AS NEEDED	IODINE-131 AS IODIDE FOR TREATMENT OF THYROID CARCINOMA		
10 CFR 35.100, SCHEDULE A, GROUP V		AS NEEDED	XENON-133 AS GAS OR GAS IN SALINE FOR BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES		
10 CFR 35.100, SCHEDULE A, GROUP VI					
<b>6.b. RADIOACTIVE MATERIAL FOR USES NOT LISTED IN ITEM 6.a.</b> (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		
* 99m Technetium	Pertechnetate	2000	Cardiac dynamic function tests		
8510040124 850919 REG3 LIC30 24-18814-01 PDR		License Fee Information on Next Page		CONTROL NO. 79077	

# 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. 1 Date: October 1980

7. MEDICAL ISOTOPES COMMITTEE not applicable		15. GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIAL (Check One)	
<input type="checkbox"/>	Names and Specialties Attached; and	<input checked="" type="checkbox"/>	Appendix G Rules Followed; or
<input type="checkbox"/>	Duties as in Appendix B; or _____ (Check One)	<input type="checkbox"/>	Equivalent Rules Attached
<input type="checkbox"/>	Equivalent Duties Attached	16. EMERGENCY PROCEDURES (Check One)	
8. TRAINING AND EXPERIENCE		<input checked="" type="checkbox"/>	Appendix H Procedures Followed; or
<input type="checkbox"/>	Supplements A & B Attached for Each Individual User; and	<input type="checkbox"/>	Equivalent Procedures Attached
<input checked="" type="checkbox"/>	Supplement A Attached for RSO.	17. AREA SURVEY PROCEDURES (Check One)	
9. INSTRUMENTATION (Check One)		<input type="checkbox"/>	Appendix I Procedures Followed; or
<input checked="" type="checkbox"/>	Appendix C Form Attached; or	<input checked="" type="checkbox"/>	Equivalent Procedures Attached
<input type="checkbox"/>	List by Name and Model Number	18. WASTE DISPOSAL (Check One)	
10. CALIBRATION OF INSTRUMENTS		<input checked="" type="checkbox"/>	Appendix J Form Attached; or
<input checked="" type="checkbox"/>	Appendix D Procedures Followed for Survey Instruments; or _____ (Check One)	<input type="checkbox"/>	Equivalent Information Attached
<input type="checkbox"/>	Equivalent Procedures Attached; and	19. THERAPEUTIC USE OF RADIOPHARMACEUTICALS (Check One) Not applicable	
<input checked="" type="checkbox"/>	Appendix D Procedures Followed for Dose Calibrator; or _____ (Check One)	<input type="checkbox"/>	Appendix K Procedures Followed; or
<input type="checkbox"/>	Equivalent Procedures Attached	<input type="checkbox"/>	Equivalent Procedures Attached
11. FACILITIES AND EQUIPMENT		20. THERAPEUTIC USE OF SEALED SOURCES Not Applicable	
<input checked="" type="checkbox"/>	Description and Diagram Attached	<input type="checkbox"/>	Detailed Information Attached; and
12. PERSONNEL TRAINING PROGRAM		<input type="checkbox"/>	Appendix L Procedures Followed; or _____ (Check One)
<input checked="" type="checkbox"/>	Description of Training Attached	<input type="checkbox"/>	Equivalent Procedures Attached
13. PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL		21. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE GASES (e.g., Xenon - 133) Not applicable	
<input checked="" type="checkbox"/>	Detailed Information Attached	<input type="checkbox"/>	Detailed Information Attached
14. PROCEDURES FOR SAFELY OPENING PACKAGES CONTAINING RADIOACTIVE MATERIALS (Check One)		22. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL IN ANIMALS	
<input type="checkbox"/>	Appendix F Procedures Followed; or	<input type="checkbox"/>	Detailed Information Attached Not applicable
<input type="checkbox"/>	Equivalent Procedures Attached	23. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b	
<input type="checkbox"/>	Detailed Information Attached	License Fee Information	

## 24. PERSONNEL MONITORING DEVICES

TYPE (Check appropriate box)		SUPPLIER	EXCHANGE FREQUENCY
a. WHOLE BODY	<input checked="" type="checkbox"/> FILM	R. S. Landauer, Inc.	monthly
	<input type="checkbox"/> TLD		
	<input type="checkbox"/> OTHER (Specify)		
b. FINGER	<input type="checkbox"/> FILM		
	<input checked="" type="checkbox"/> TLD	R. S. Landauer, Inc.	monthly
	<input type="checkbox"/> OTHER (Specify)		
c. WRIST	<input type="checkbox"/> FILM		
	<input type="checkbox"/> TLD		
	<input type="checkbox"/> OTHER (Specify)		

d. OTHER (Specify)

June 14 - III  
 Applicant... 12045... 7100  
 Check No. 11776  
 Amount/Fee Category... 480... 7C+  
 Type of Fee... Renewal  
 Date Check Rec'd... 6/30/85  
 Received By... J. S. Landauer

## 25. FOR PRIVATE PRACTICE APPLICANTS ONLY

a. HOSPITAL AGREEING TO ACCEPT PATIENTS CONTAINING RADIOACTIVE MATERIAL

NAME OF HOSPITAL

See attached

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

7-C

(2) LICENSE FEE ENCLOSED: \$ 480.00

b. APPLICANT OR CERTIFYING OFFICIAL (Signature)

(1) NAME (Type or Print)

Stanley D. Sides, M.D.

(2) TITLE

President

c. DATE

5-28-85

MAY 30 1985

REGION III



SOUTHEAST  
MISSOURI  
HOSPITAL

May 24, 1985

Mr. William E. Port  
Clinic Administrator  
Internal Medicine Group  
14 Doctors' Park  
Cape Girardeau, Missouri 63701

Dear Mr. Port:

It is my understanding that W. Kirk Bowman, Jr., M.D. has applied for renewal of an existing NRC license.

You are hereby assured that should any complications arise during the diagnostic procedures utilizing the radioactive materials that the patient may be immediately transferred to our Hospital for care. We do have selected rooms that have been cleared for treatment of patients with radioactive materials where your patients could be admitted, should the need for proper isolation of a patient with radioactive materials be required.

If you have further questions or suggestions on how transfers may be implemented, please let me know.

Sincerely yours,

Richard W. Meyer  
Assistant Administrator

RWM/ih



Saint  
Francis  
Medical  
Center

SERVING THE HEALTH CARE NEEDS OF  
SOUTHEAST MISSOURI AND SOUTHERN ILLINOIS  
FOR MORE THAN 108 YEARS

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May 28, 1985

William E. Port  
Clinic Administrator  
Internal Medicine Group  
14 Doctors' Park  
Cape Girardeau, Missouri 63701

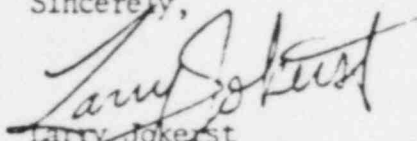
Dear Bill:

Please accept this letter certifying St. Francis Medical Center will accept any nuclear cardiology patient from your office should any complications arise during the diagnostic procedures performed in your office using radioactive material.

You have the Medical Center's approval to include this letter as part of your NRC license application.

Please feel free to contact me if you have any questions or need additional information.

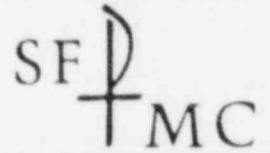
Sincerely,

  
Larry J. Keusen  
Executive Vice President

LJ:dai

cc: John J. Keusenkothen

# ST. FRANCIS MEDICAL CENTER



September 11, 1979

William E. Port  
Clinic Administrator  
Internal Medicine Group  
14 Doctors' Park  
Cape Girardeau MO 63701

Dear Bill:

Please accept this letter certifying St. Francis Medical Center will accept any nuclear cardiology patient from your office should any complications arise during the diagnostic procedures performed in your office using radioactive material.

You have the Medical Center's approval to include this letter as part of your NRC license application.

Please feel free to contact me if you have any questions or need additional information.

Sincerely,

Howard A. Hayes  
Associate Administrator

HH/dmh

cc: John J. Keusenkothen

COMMITTED TO TENDER COMPREHENSIVE HEALTH CARE

St. Francis Drive at Gordonville Road, Cape Girardeau, Missouri 63701, (314) 335-1251

CONTROL NO. 7 9 0 7 7



# SOUTHEAST HOSPITAL

1701 Lacey, Cape Girardeau, Mo. 63701

Phone (314) 334-4822

September 11, 1979

Mr. William E. Port  
Clinic Administrator  
Internal Medicine Group  
14 Doctors' Park  
Cape Girardeau, Missouri 63701

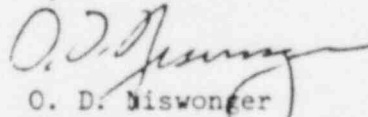
Dear Bill:

It is my understanding that Dr. W. Kirk Bowman, Jr. has applied for an NRC license in order to provide an additional service from your Group of nuclear cardiology.

You are hereby assured that should any complications arise during the diagnostic procedures utilizing the radioactive materials that the patient may be immediately transferred to our Hospital for care. We do have selected rooms that have been cleared for treatment of patients with radioactive materials where your patients could be admitted should the need for proper isolation of a patient with radioactive materials be required.

If you have further questions or suggestions on how transfers may be implemented, please let me know.

Sincerely yours,

  
O. D. Diswonger  
Administrator

ODN/ih



MEETINGS AND CONTINUING EDUCATION OF NUCLEAR CARDIOLOGY PROCEDURES

<u>DATE</u>	<u>NAME OF MEETING</u>	<u>DURATION</u>
February, 1978	Barnes Hospital, St. Louis Field trip with St. Francis x-ray personnel to observe nuclear cardiology techniques	1 day
February, 1978	Northwestern University Medical Center, Field trip with St. Francis Staff to observe nuclear cardiology equipment	1 day
March, 1978	Barnes Hospital, St. Louis Meeting on Clotting and Nuclear Cardiology	2 days
March, 1978	Mt. Sinai Hospital, Nuclear Cardiology Meeting	2 days
September, 1978	Hilton Head, North Carolina Nuclear Cardiology Meeting	3 days
October, 1978	Milwaukee, Wisconsin Nuclear Cardiology Meeting	3 days
May, 1979	Washington, D.C., American College of Cardiologists, Nuclear Cardiology Meeting	4 days
June, 1979	Nuclear Cardiology Meeting Chicago, IL	2 days
July 15 - September 15, 1979	Duke University Nuclear Cardiology Lab, training under R. Edward Coleman, M.D. performing RNA's and thallium exercise tests	7 weeks
January 7-18, 1980	General Electric Medical Education Basics of Nuclear Medicine, see attached certificate	
March 24-26, 1980	General Electric Medical Education Training, Q C and Compliance, see attached certificate	
April 28-30, 1980	General Electric Medical Education Radiopharmaceutical Techniques, see attached certificate	



<u>DATE</u>	<u>NAME OF MEETING</u>	<u>DURATION</u>
January - August, 1980	Performed 203 resting RNA studies and 200 stress RNA studies at the Internal Medicine Group, 14 Doctors' Park, Cape Girardeau, under the supervision of John Gantz, M.D.	
August -	Arrangements have been made for me to spend one day per month with John Gantz, M.D. at St. Mary's Medical Center in St. Louis for further study and review of pyrophosphate myocardial scans and thallium rest and exercise scans.	
October, 1981	Milwaukee, Wisconsin Nuclear Cardiology Meeting	3 days
October, 1983	Milwaukee, Wisconsin Nuclear Cardiology Meeting	3 days

DR. BOWMAN, JR., M.D.

RNA Rest & Stress Performed In Office

1980	440
1981	446
1982	242
1983	189
1984	169
1985	30

Nuclear studies done in hospital not  
included in the above totals

NAME OF AUTHORIZED USER

W. Kirk Bowman, Jr., M.D.

AUTHORIZATION

99m technicium pertechnetate  
for cardiac dynamic function  
tests.  
(See previous license)

John A. Gantz, M.D.

See previous license and  
license #24-08960-02 and  
license #24-09769-02

NAME OF RADIATION SAFETY OFFICER

W. Kirk Bowman, Jr., M.D.

NAME OF CONSULTING PHYSICIST

William J. Nalesnik, Ph.D.

Dr. Nalesnik will conduct quarterly reviews of our radiation safety program, give lectures and inservices on radiation safety, and attend to other matters necessary to insure compliance with the terms of our NRC license. He is available on 2-3 hours notice if necessary. His quarterly reports are reviewed on site with the chief nuclear medicine technologist, and at a later time by Dr. Bowman.

For evidence of previous training and experience, refer to license #24-08960-02. A copy of the information provided in that license is attached for convenience.

Item #8  
1 of 1 page  
prepared 5/23/85  
license #24-18814-01

TRAINING AND EXPERIENCE  
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER William J. Nalesnik, Ph.D.	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE N/A
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3. CERTIFICATION		
SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C
None		

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	Memorial Hospital for Cancer and Allied Diseases. Department of Medical Physics 1275 York Avenue	130	970
b. RADIATION PROTECTION	New York, New York 10021 October 1971 to July 1972	30	120
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY		47	170
d. RADIATION BIOLOGY		30	
e. RADIOPHARMACEUTICAL CHEMISTRY	Veteran's Administration Hospital Department of Nuclear Medicine St. Louis, Missouri 1974-76		160

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	Teletherapy	Memorial Hospital St Louis University	9 mos 8 years	Therapy
Ra-226	200 mgms	Yale New Haven Hospital	2	Therapy
Ir-192	100 mCi	" & St. Louis University	10 Years	Therapy
Cs-137	300 mCi	Yale & St. Louis University		
I-131	150 mCi	Yale, VA Hospital, St. Louis University, St. Mary's	10 Years	Therapy & Iodinations
P-32	30 mCi	Memorial, VA, Yale, SLU	10 Years	Therapy

OTHER ISOTOPIES USED IN DIAGNOSTIC NUCLEAR MEDICINE

ITEM 5: EXPERIENCE WITH THERAPEUTIC AMOUNTS OF RADIOACTIVE MATERIALS

William J. Nalesnik, PhD

Co-60	Teletherapy	Nine Years
Ra 226	200 mgms	Yale New Haven Hospital 2 years
Ir 192	100 mCi	& St. Louis University 8 years
I 125	30 mCi	& Veterans Administration Hospital
Cs 137	300 mCi	& St. Mary's Health Center
I 131	150 mCi	

See also attached letters from Memorial and Veterans Administration Hospital to confirm basic training with isotopes.

## EXHIBIT B

NRC Form 313T Supplement A (8-81) 10 CFR 20		U.S. NUCLEAR REGULATORY COMMISSION			
TRAINING AND EXPERIENCE PROPOSED AUTHORIZED USER OR RADIATION SAFETY OFFICER					
1. NAME OF PROPOSED AUTHORIZED USER OR RADIATION SAFETY OFFICER <b>William J. Nalesnik, Ph.D.</b>			2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE (if applicable) <b>na</b>		
3. CERTIFICATION					
SPECIALTY BOARD		CATEGORY		MONTHS AND YEARS CERTIFIED	
<b>na</b>					
4. TRAINING: RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES (to be completed by the person(s) conducting training)					
FIELD OF TRAINING	LOCATION AND DATES OF TRAINING		LESSONS/LECTURES (hours/minutes)	PERSONS RECEIVING SPECIALTY BOARD EXPERIENCE (hours)	
RADIATION PHYSICS AND INSTRUMENTATION	Memorial Hosp. Dept. of Medical Physics Oct. 1971 to July 1972		130	970	
RADIATION PROTECTION	as above		30	120	
MATHEMATICS PERTAINING TO THE USE, MEASUREMENT, AND SHIELDING OF RADIOACTIVE SOURCES	as above		47	170	
RADIATION BIOLOGY	as above		30 (seminars)		
5. EXPERIENCE WITH RADIOACTIVE MATERIALS* (to be completed by the person(s) conducting training)					
ISOTOPE	MAXIMUM AMOUNT FOR ANY SINGLE APPLICATION	WHERE EXPERIENCE WAS GAINED	DATE OF EXPERIENCE	TYPE OF USE	
<p>1. Review of isotope source calibration and periodic spot checks (max. 1000 curies) 2. Isotope source calibration of sealed sources (max. 1000 curies) (max. 1000 curies) 3. Calibration of ion chambers and survey meters</p> <p>* Experience with sealed sources (max. 1000 curies) (max. 1000 curies) (max. 1000 curies) * Experience with unsealed sources (max. 1000 curies) (max. 1000 curies) (max. 1000 curies) * Experience with unsealed sources (max. 1000 curies) (max. 1000 curies) (max. 1000 curies)</p>					
6. I CERTIFY THAT THE INFORMATION CONTAINED ABOVE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.					
<p><i>Gian D. Ragazzoni, M.S.</i>          7. SIGNED ON PRINTED NAME  <b>Gian D. Ragazzoni, M.S., Postdoctoral Fellowship Program Coordinator</b> 9/8/82          NAME OF INSTITUTION  <b>Memorial Hospital for Cancer &amp; Allied Diseases</b>          MAILING ADDRESS  <b>1275 York Ave.</b>          CITY  <b>New York</b>          STATE  <b>NY</b> ZIP CODE  <b>10021</b>          TELEPHONE (AREA CODE AND NUMBER)  <b>na</b></p>					
WARNING: 18 U.S.C. Section 1001, Act of June 25, 1948 (62 Stat. 749) makes it a criminal offense to make a materially false statement in representation to any department or agency of the United States as to any matter within its jurisdiction.					



Veterans  
Administration

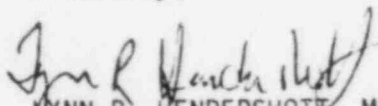
December 8, 1982



TO WHOM IT MAY CONCERN:

Dr. William Nalesnik has actively participated in the preparation and handling of radioisotopes for the clinical nuclear medicine laboratory at the St. Louis VA Medical Center. Dr. Nalesnik participated in the preparation and handling for approximately 160 hours while employed as a Radiation Physicist at this medical center.

Sincerely,

  
LYNN R. HENDERSHOTT, M.S.  
Radiopharmacist  
Nuclear Medicine Service (115JC)



## CURRICULUM VITAE

NAME: William J. Nalesnik

Date of Birth: February 21, 1942

Citizenship: United States

Marital Status: Married, 3 children

Social Security: 221-26-4718

### Education:

- 1971 Post doctoral fellow in Medical Physics, Memorial Sloan Kettering Institute, New York City
- 1972 Ph.D., Nuclear Astrophysics, University of Pennsylvania
- 1967 M.S. Solid State Physics, University of Delaware
- 1964 B.S. Physics University of Delaware

### Medical and Academic Appointments:

- 1982- St. Mary's Health Center, St. Louis, Missouri, Physicist  
St. Louis University School of Medicine, Assoc. Prof.  
of Radiology (Physics)
- 1974- St. Louis University School of Medicine, Assistant  
Professor, Department of Radiology (1974-80), Assistant  
Professor, Department of Radiation Oncology (1980-81)  
Associate Professor, Department of Radiation Oncology  
(1981- ), Associate Professor, Dept. of Physics  
(Joint appointment 1978-- )
- 1974- St. Louis Veteran's Administration Hospital, Staff  
Physicist
- 1972- Health Physicist & Lecturer, Yale University School  
of Medicine (72-74)
- 1970 Instructor, Colgate University, Acting Director  
Colgate Observatory (Sabbatical replacement 70-71)
- 1968 Instructor, Department of Physics, PMC Colleges,  
(68-69)
- 1968 Instructor, Department of Astronomy, University of  
Pennsylvania (Summer)

### Industrial and Research:

- 1969 William A. Mosher Company, Newark, Delaware  
Managed small business involved in specialty  
chemical preparation and purification during  
owner's absence
- 1969 Goddard Space Flight Center, Greenbelt, Maryland  
Summer research fellow in astrochemistry
- 1968 U.S. Atomic Energy Commission Health and Safety  
Laboratories, New York, New York Participated  
in experiments to measure neutron spectra in

accelerator environments.

Other Appointments:

- 1978 University of Tennessee, Knoxville, Tennessee  
Visiting scientist in image processing  
laboratory (ongoing appointment)
- 1978 National Cancer Institute Patterns of Care Study  
Site Visitor (78-79)
- 1980 American Association of Physicists in Medicine,  
Radiation Protection Committee

Professional Societies:

American Association of Physicists in Medicine

Committees:

- Radiation Safety Committee, St. Mary's Health Center
- Radioisotope Committee, St. Louis Veteran's Administration  
Hospital
- Radioactive Drug Research Committee, St. Louis Veteran's  
Administration Hospital
- Radioisotope Committee, St. Louis University Medical Center
- Radiation Safety Committee, St. Louis University Hospitals
- Biohazard and Environmental Safety Board, St. Louis University

Master's Thesis:

Change of Electrical Conductivity of CdS Single Crystals During  
Heat Treatment in a Sulfur Atmosphere

Doctoral Dissertation:

Differential Cross Sections between 20 and 300 MeV for Neutron  
Production in the Spallation of Carbon, Aluminum, and Cobalt by  
3 GeV Protons

Courses taught at St. Louis University

- Introduction to the Physics of Diagnostic and Therapeutic  
Radiology
- Physics of Diagnostic Radiology
- Radiological Physics Board Review Course
- Ph 91-434 & 436 Introduction to Health Physics
- Ph 91-435 & 437 Health Physics Laboratory
- Ph 91-689 Seminar in radiobiology
- Ph 91-689-01 Seminar in radiation dosimetry I
- Ph 91-689-02 Seminar in radiation dosimetry II

In charge of administering Master's Program in Health  
Physics (1980- ), Department of Physics

**APPENDIX C**  
**INSTRUMENTATION**

1. Survey meters

- a. Manufacturer's name: Nuclear Medicine Instruments and Accessories  
Manufacturer's model number: DG-7  
Number of instruments available: 1  
Minimum range: 0 mR/hr to 0.2 mR/hr  
Maximum range: 0 mR/hr to 20 mR/hr
- b. Manufacturer's name: Victoreen  
Manufacturer's model number: 740 D  
Number of instruments available: 1  
Minimum range: 0.5 mR/hr to 25 mR/hr  
Maximum range: 500 mR/hr to 25,000 mR/hr

2. Dose calibrator

- Manufacturer's name: RADX  
Manufacturer's model number: Assayer 1 Model 225  
Number of instruments available: 1

3. Instruments used for diagnostic procedures

Type of Instrument	Manufacturer's Name	Model No.
Gamma Camera	Baird Atomic	System 77

4. Other (e.g., liquid scintillation counter, area monitor, velocimeter)

Item #9  
Prepared 5/23/85  
Page 1 of 1  
Lic. #24-18814-01

## CALIBRATION OF SURVEY INSTRUMENTS

Check appropriate items.

- ☒ 1. Survey instruments will be calibrated at least annually and following repair.
- ☒ 2. Calibration will be performed at two points on each scale used for radiation protection purposes, i.e., at least up to 1 R/hr.

The two points will be approximately 1/3 and 2/3 of full scale. A survey instrument may be considered properly calibrated when the instrument readings are within  $\pm 10$  percent of the calculated or known values for each point checked. Readings within  $\pm 20$  percent are considered acceptable if a calibration chart, graph, or response factor is prepared, attached to the instrument, and used to interpret readings to within  $\pm 10$  percent. Also, when higher scales are not checked or calibrated, an appropriate precautionary note will be posted on the instrument.

3. Survey instruments will be calibrated

- ☒ a. By the manufacturer
- ☐ b. At the licensee's facility

- (1) Calibration source

Manufacturer's name \_\_\_\_\_  
Model no. \_\_\_\_\_  
Activity in millicuries \_\_\_\_\_  
or  
Exposure rate at a specified distance \_\_\_\_\_  
Accuracy \_\_\_\_\_  
Traceability to primary standard \_\_\_\_\_

- ☐ (2) The calibration procedures in Section I of Appendix D will be used  
or  
☐ (3) The step-by-step procedures, including radiation safety procedures, are attached.

- ☒ c. By a consultant or outside firm

- (1) Name R. M. Wester and Associates
- (2) Location 3317 Highway 94 North, St. Charles, Mo. 63301
- (3) Procedures and sources

☒ have been approved by NRC and are on file in License No. 24-20091-01

☐ have been approved by an Agreement State: a copy of the Agreement State license, the procedures, and a description of the sources are attached, and the consultant's report will contain the information on

☐ the attached "Certificate of Instrument Calibration."

☐ the consultant's reporting form as attached.

☐ are described in the attachment, and the consultant's report will contain the information on

☐ the attached "Certificate of Instrument Calibration."

☐ the consultant's reporting form as attached.

Item #10  
page 1 of 2  
Prepared 5/23/85  
Lic #24-18814-01

10.8-25

CONTROL NO. 79077

## CALIBRATION OF DOSE CALIBRATOR

### A. Sources Used for Linearity Test

(Check as appropriate)

  X   First elution from new Mo-99/Tc-99m generator

or

           Other\* (specify) \_\_\_\_\_

### B. Sources Used for Instrument Accuracy and Constancy Tests

Radionuclide	Suggested Activity (mCi)	Activity (mCi)	Accuracy
Co-57	3-5	<u>  3-5  </u>	<u>  ± 5%  </u>
Ba-133	0.1-0.5	<u>100 uCi or more</u>	<u>  ± 5%  </u>
Cs-137	0.1-0.2	<u>100 uCi or more</u>	<u>  ± 5%  </u>
Ra-226	1-2	<u>          </u>	<u>          </u>
<u>          </u>		<u>          </u>	<u>          </u>

C.   X   The procedures described in Section 2 of Appendix D will be used for calibration of the dose calibrator

or

           Equivalent procedures are attached.

\*For licensees who are not authorized for Mo-99/Tc-99m generators, activity must be equivalent to the highest activity used.

All sources have an accuracy of better than ±5% and are NBS traceable.  
Daily constancy checks will be performed with the Cs-137 source.

As an alternative procedure, the linearity test can be performed with the use of the Calicheck kit from Calcorp, Inc. The manufacturer's instructions dated 3-2-82 will be followed. The source used shall be the first elution of a new generator. In the event that the entire amount cannot be used, linearity testing will be done with a reduced amount, but always greater than 200 mCi. The reduced amount will then be established as the maximum activity to be employed for patient doses or kit preparation for the remainder of the quarter or until linearity testing can be repeated utilizing a greater activity. Thus, the accuracy of the unit will always be assured over the range of activities used for kit preparation.

Item #10  
page 2 of 2  
prepared 5/23/85  
Lic. #24-18814-01

## FACILITIES AND EQUIPMENT DESCRIPTION

All radioactive sources are stored in such a manner so as to not exceed 2 mR/hr at the surface of the barrier.

The Mo-99/Tc-99m generator will be stored and eluted in the designated area. It will be shielded with lead bricks such that levels from all avenues of approach do not exceed 2.0 mR/hr. Spent generators will be stored in the basement storage facility shown in the attached diagram.

During elution, the eluate will be collected, assayed, and stored in a vial held in a quarter inch lead pig except during brief periods of transfer. Transfer of the eluate or portions of the eluate will be made by the use of syringes retained in lead shields designed for this purpose.

Eluates and compounds made from eluates will be drawn, synthesized, assayed and stored in lead vials or syringes such that levels as measured at contact with a low level survey meter do not exceed 2.0 mR/hr except for brief periods during the actual transfer.

Radioactive materials obtained from radiopharmacy suppliers will be stored in their original shipping containers. If necessary, the doses will be placed behind additional shielding to reduce activity levels emitted from the container to 2 mR/hr or less.

Syringe shields will be used on all accessories requiring the transfer of radiopharmaceuticals from vial to vial and in drawing up patient doses. Syringe shields will also be used in the administration of doses to patients except when the patient's well being may be compromised. Under these circumstances, the dose containing syringes will be kept shielded up to the moment of injection.

Steps in the preparation of compounds requiring periods of heating, shaking, agitation or mixing will be performed utilizing lead shielding and/or mechanical or ultrasonic agitation equipment and/or remote handling devices (tongs, forceps, etc.) such that levels during the above period as measured by a low level survey meter do not exceed 2 mR/hr.

Item #11  
1 of 4 pages  
Prepared 5/23/85  
Lic. #24-18814-01

Protective outer garments, such as laboratory coats and rubber gloves will be worn while handling radioactivity in uncontained form.

All possible set-ups will be made on easily cleanable trays. All trays and all other work surfaces will be covered with disposable absorbent paper.

A decontamination kit will be maintained in the department. It will include the following items:

#### DECONTAMINATION KIT

ITEM	PURPOSE
1. Warning tape, chalk & signs	Posting of area
2. Plastic bags, small	Shoe covers, wet containers
3. Disposable gloves	Hand protection
4. Masking tape	Fasten shoe covers, etc.
5. Forceps, tongs	Safe handling
6. Large plastic bags	Contaminated material
7. Sponges, 4x4	Sopping up
8. Paper towels	Blotting and drying
9. Radiac wash or detergent	Detergent
10. Scouring powder	Friction
11. Tags	Identification
12. Scissors	Cutting absorbent paper, etc.
13. Whatman #1 filter paper	Taking swipes following decontamination
14. Chux	Cover area following decontamination
15. G-M Survey meter	Monitoring

#### STORAGE AREAS:

All radioactive materials used on a daily basis are stored in the hot lab which is kept locked at all times when it is not in use. Calibration sources and elutions are stored in lead containers behind the L-block. The sides of the L-block dose preparation area are shielded with 2 inch lead brick. The generator is also shielded with 2 inch lead brick so that the maximum dose rate from all avenues of approach is less than 2 mR/hr. Radioactive wastes are stored in a lead storage container located under the counter. After decay to background as confirmed with the G-M survey meter, these wastes are discarded as regular trash.

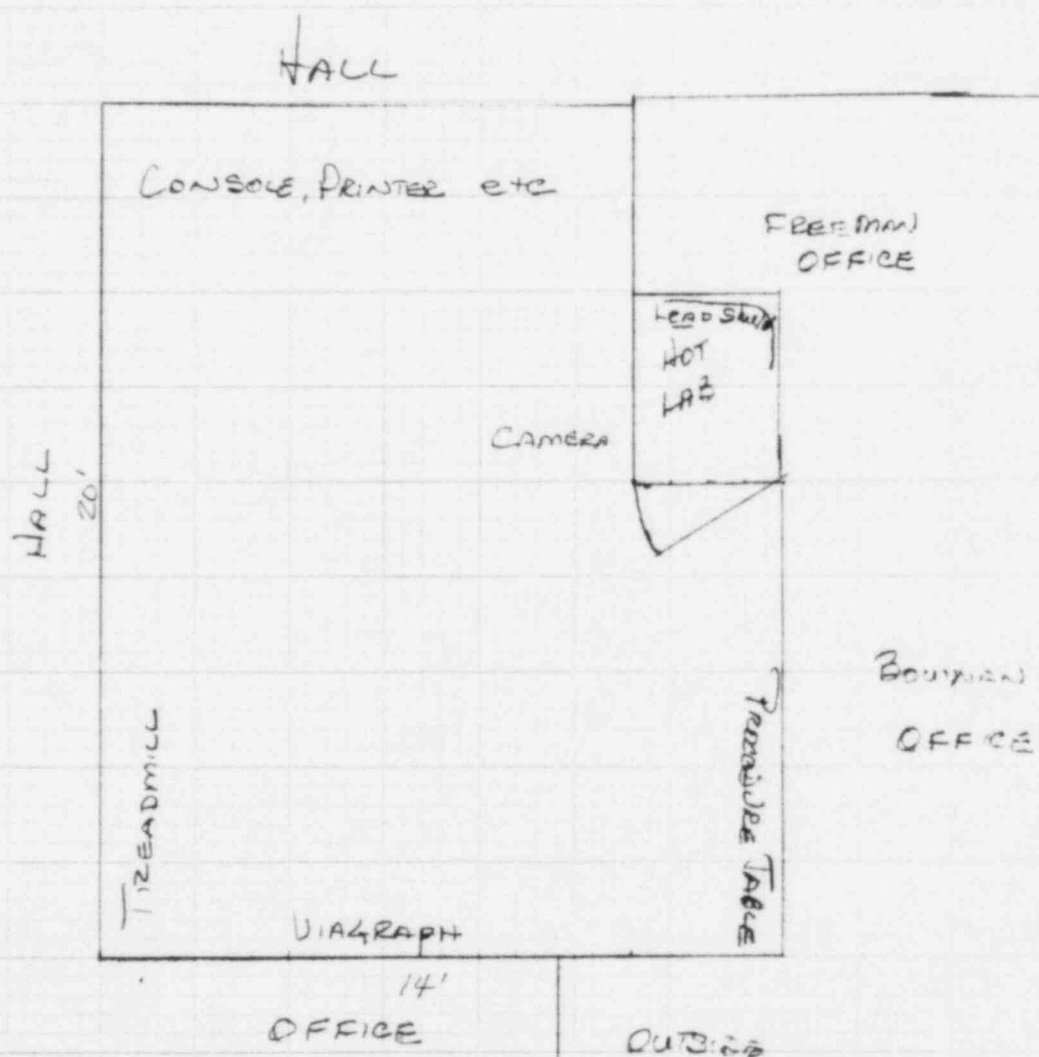
Spent generators are stored in a lockable basement storage area appropriately marked. Generators are kept for more than 10 half lives and then returned to the manufacturer. The area is surveyed on a weekly basis.

Item #11  
2 of 4 pages  
Prepared 5/23/85  
Lic. #24-18814-01

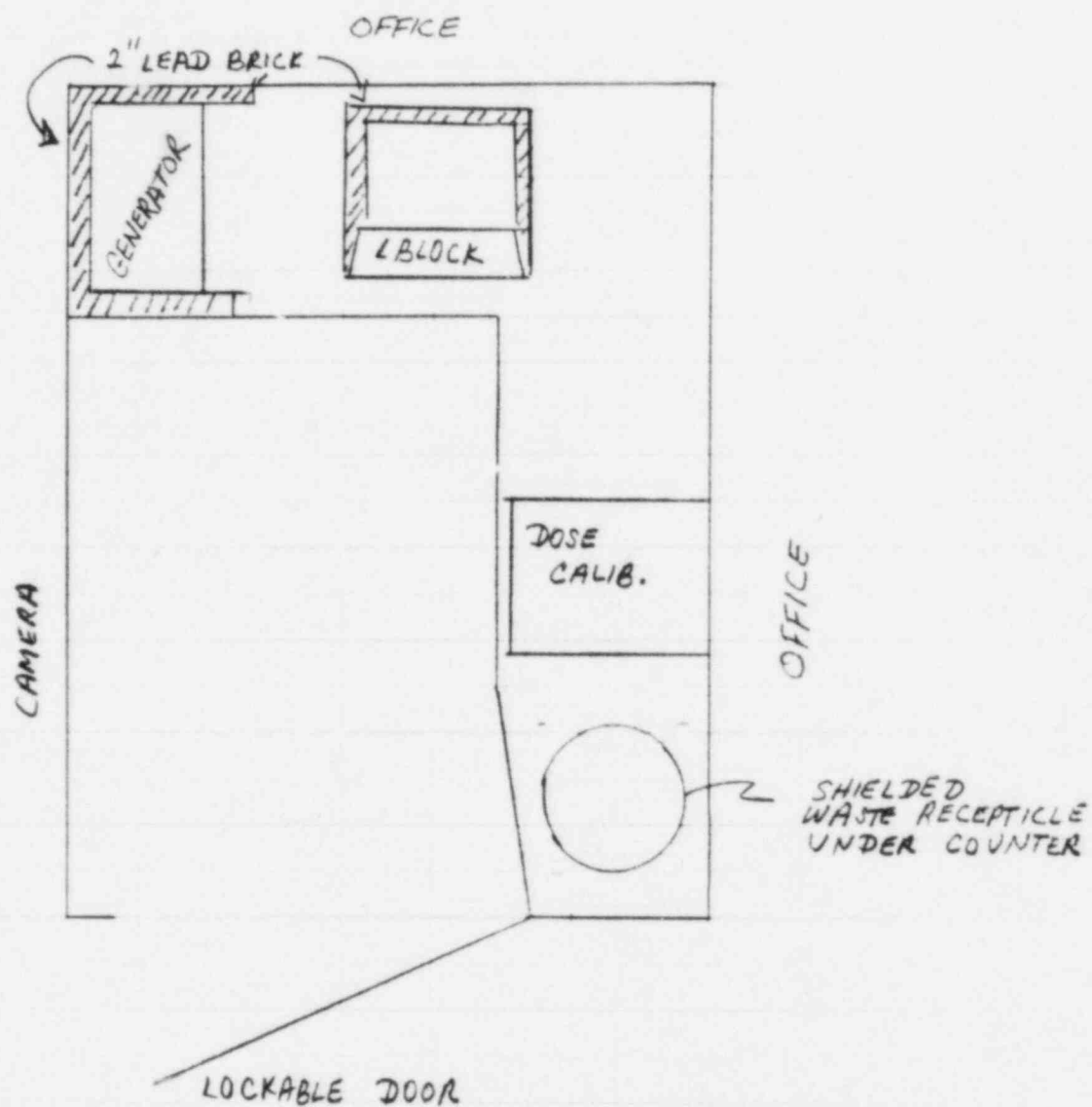
CONTROL NO. 9077



# INTERNAL MEDICINE GROUP RNA FACILITY 3 HOT LAB



Item #11  
3 of 4 Pages  
Prepared 5/23/85  
Lic. #24-18814-01



HOT LAB (3'6" x 4'6")

Item #11  
4 of 4 pages  
Prepared 5/23/85  
Lic # 24-18814-01

## PERSONNEL TRAINING PROGRAM

In accordance with Section 19.12 of 10 CFR, Part 19, the following is a description of the training required for all personnel who work with or in the vicinity of radioactive materials:

1. The nuclear medicine department will be staffed by individuals who will be classified as occupational employees. These individuals will perform their duties from the radiation safety viewpoint under the direction of the physician(s) named on the license application.
2. All personnel who work with radioactive materials shall have completed a formal course of training approved by the American Medical Association and be registered or be registry eligible by the American registry of Radiological Technologists, or the American Society of Clinical Pathologists or the Certifying Board of Nuclear Medicine Technologists.
3. Orientation of such personnel will be done by the physician named on the license or the supervising technologist will include the following:
  - a. Indicate areas where radioactive materials are used or stored.
  - b. Potential hazards associated with radioactive materials.
  - c. Radiological safety procedures appropriate to their respective duties.
  - d. Pertinent NRC regulations.
  - e. The rules and regulations of the license.
  - f. The pertinent terms of the license.
  - g. Their obligation to report unsafe conditions.
  - h. Appropriate response to emergencies or unsafe conditions.
  - i. Their right to be informed of their radiation exposure and bioassay results.
  - j. Location where the licensee has posted or made available notices, copies of pertinent regulations, and copies of pertinent licenses and license conditions (including applications and applicable correspondence) as required by 10 CFR, Part 19.

Item #12  
1 of 2 pages  
Prepared 5/23/85  
Lic. #24-18814-01

3. Our consulting physicist will visit our facility quarterly, or as required to review all procedures, equipment and records. Personnel will receive refresher training relative to duties, regulations, or terms of the license during these visits or by the physicians named on this license application or by supplementary training at least annually or more frequently, as needed.
4. Access into areas where radioactive material is stored or used will be restricted for nonoccupational personnel. When it is necessary for nonoccupational personnel to enter these areas, personnel so involved will be present under the direction of the nuclear medicine technologist, who will ensure that the exposure of these persons is held to the minimum required for the performance of the nuclear medicine procedure.
5. All non-occupational personnel will receive instruction as to the location and potential hazards associated with radioactive material during their orientation process and annually thereafter in the form of verbal instructions and/or memos.

Item #12  
2 of 2 pages  
Prepared: 5/23/85  
Lic. #24-18814-01

## PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL

1. The Nuclear Medicine technologist or his/her designee will place all orders for radioactive material and will ensure that the requested materials and quantities are authorized by the license, and that possession limits are not exceeded.
2. During normal working hours, carriers are instructed to deliver radioactive packages directly to the hot lab/preparation room.
3. During off-duty hours-
  - a. The material will be delivered to the staff entrance and secured (locked) in the permanent receptacle provided.
  - b. The first staff member to arrive will transport the material to the hot lab/preparation area.
  - c. If the package is wet or damaged, the Radiation Safety Officer or his designee is to be notified immediately:

Dr. W. Kirk Bowman  
Home: 334-5425

or

Dr. William Nalesnik  
Office: 1-314-768-8267  
Home: 1-314-822-0267

If possible, the courier will be advised to remain at the scene until the RSO or his designee can conduct appropriate surveys to determine if the courier or his vehicle is contaminated.

4. Fill out and file the Radioactive Shipment Receipt Report.

## APPENDIX F

### Procedures for Safely Opening Packages Containing Radioactive Material

1. 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 48 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 removable contamination exceeds 0.01 uCi/100 cm<sup>2</sup> or if external radiation levels exceed 200 mR/hr at the package surface or 10 mR/hr at 3 feet or 1 meter.
2. For all packages, the following additional procedures for opening packages will be implemented:
  - a. Put on gloves to prevent hand contamination.
  - b. Visually inspect package for signs of damage (e.g., wetness, crushed). If damage is noted, stop procedure and notify Radiation Safety Officer.
  - c. Measure exposure rate at 3 feet (or 1 meter) from package surface and record. If >10 mR/hr, stop procedure and notify Radiation Safety Officer.
  - d. Measure surface exposure rate and record. If >200 mR/hr stop procedure and notify Radiation Safety Officer.
  - e. Open the package with the following precautionary steps:
    - (1) Open the outer package (following manufacturer's directions if supplied).
    - (2) Open inner package and verify that contents agree with those on packing slip. Compare requisition, packing slip, and label on bottle.

(3) Check integrity of final source container (i.e., inspect for breakage of seals or vials, loss of liquid, and discoloration of packaging material).

(4) Check that shipment does not exceed possession limits.

- f. Wipe external surface of final source container shield and remove wipe to low background area. Check wipes with G-M survey meter in accordance with instructions in item #17 of this document "Alternate Survey Procedures", and take precaution against spread of contamination as necessary.
- g. Monitor the packing material and packages for contamination before discarding.
  - (1) If contaminated, treat as radioactive waste.
  - (2) If not contaminated, obliterate radiation labels before discarding in regular trash.

3. Maintain records of the results of checking each package.

Item #14  
2 of 2 pages  
Prepared 3/23/85  
Lic. # 24-18814-01



## APPENDIX H

### Emergency Procedures

#### Minor Spills:

1. NOTIFY: Notify persons in the area that a spill has occurred.
2. PREVENT THE SPREAD: Cover the spill with absorbent paper.
3. CLEAN UP: Use disposable gloves and remote handling tongs. Carefully fold the absorbent paper and pad. Insert into a plastic bag and dispose of in the radioactive waste container. Also insert into the plastic bag all other contaminated materials such as disposable gloves.
4. SURVEY: With a low range, thin window G-M survey meter, check the area around the spill, hands and clothing for contamination.
5. REPORT: Report incident to the Radiation Safety Officer.

#### Major Spills:

1. CLEAR THE AREA: Notify all persons not involved in the spill to vacate the room.
2. PREVENT THE SPREAD: Cover the spill with absorbent pads, but do not attempt to clean it up. Confine the movement of all personnel potentially contaminated to prevent the spread.
3. SHIELD THE SOURCE: If possible, the spill should be shielded, but only if it can be done without further contamination or without significantly increasing your radiation exposure.
4. CLOSE THE ROOM: Leave the room and lock the door(s) to prevent entry.
5. CALL FOR HELP: Notify the Radiation Safety Officer immediately.
6. PERSONNEL DECONTAMINATION: Contaminated clothing should be removed and stored for further evaluation by the Radiation Safety Officer. If the spill is on the skin, flush thoroughly and then wash with mild soap and lukewarm water.

RADIATION SAFETY OFFICER:  
OFFICE PHONE:  
HOME PHONE:

W. Kirk Bowman, M.D.  
Page  
334-5425

Alternate Names and Telephone Numbers Designated by Radiation Safety Officer:

William J. Nalesnik, Ph.D.  
1-768-8267 (office)  
1-822-0267 (home)

Item #16  
1 of 1 page  
Prepared 3.23/85  
Lic. #24-18814-01

## APPENDIX I

### Alternate Survey Procedure

- A. Routine elution, preparation, and designated injection areas will be surveyed daily with a G-M survey meter and decontaminated, if necessary. For daily surveys where no abnormal exposures are found, only the date, the identification of the individual performing the survey, and the survey results will be recorded.
- B. All other laboratory areas and long term waste storage areas will be surveyed weekly.
- C. The weekly survey will consist of:
  - 1. A measurement of radiation levels with a survey meter sufficiently sensitive to detect 0.1 mR/hr.
  - 2. A series of wipe tests to measure contamination levels. Analysis of wipe tests will be performed using a low level G-M survey meter.

The procedure will be as follows:

- a. Perform the wipe tests.
  - b. Place smears in a "baggy" or disposable glove.
  - c. Adjust response time to the longest time constant, if applicable.
  - d. Select the most sensitive range.
  - e. Turn beta shield on probe to open position.
  - f. Wait until reading stabilizes.
  - g. Read and record background.
  - h. Verify proper operation of G-M meter with test source.
  - i. Place smear in contact with open position of probe.
  - j. Wait until reading stabilizes.
  - k. Read and record wipe results.
- E. Action levels for smear analysis using the G-M survey meter will be set at any response above background. If action levels or removable contamination are found, decontamination efforts will be initiated to provide for clean-up or to prevent spread. In order to avoid unnecessary personnel exposure, contamination suspected as being caused by Tc-99m may be shielded and/or covered to prevent spread and be allowed to decay.

Item #17  
Page 1 of 2  
Prepared 5/23/85  
Lic # 24-18814-01

CONTROL NO. 79077

F. A permanent record will be kept of the weekly survey results, including the negative results. The record will include:

1. Location, date and type of equipment used.
2. Name of person conducting survey.
3. Drawing of area surveyed, identifying relevant features such as active storage areas, active waste areas, etc.
4. Measured exposure rates, keyed to location on drawing, indicating rates that require corrective action.
5. Detected contamination levels, keyed to locations on drawing.
6. Corrective action taken in the case of contamination or excessive exposure rates, reduced contamination levels or exposure rates after corrective action, and any appropriate comments.

**APPENDIX J**  
**WASTE DISPOSAL**

**Note:** In view of the recent problems with shallow-land burial sites used by commercial waste disposal firms, NRC is encouraging its licensees to reduce the volume of wastes sent to these facilities. Important steps in volume reduction are to segregate radioactive from nonradioactive waste, to hold short-lived radioactive waste for decay in storage, and to release certain materials in the sanitary sewer in accordance with § 20.303 of 10 CFR Part 20.

1. Liquid waste will be disposed of (check as appropriate)

☒ In the sanitary sewer system in accordance with § 20.303 of 10 CFR Part 20.

☐ By commercial waste disposal service (see also Item 4 below).

☐ Other (specify): \_\_\_\_\_

2. Mo-99/Tc-99m generators will be (check as appropriate)

☒ Returned to the manufacturer for disposal.

☐ 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 generators will be disposed of as normal trash.\*\*

\* Be sure that waste storage areas were described in Item 11 and that they are surveyed periodically (Item 17).

\*\* These generators may contain long-lived radioisotopic contaminants. Therefore, the generator columns will be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.

☐ Disposed of by commercial waste disposal service (see also Item 4 below).

☐ Other (specify): \_\_\_\_\_

3. Other solid waste will be (check as appropriate)

☒ 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.

☐ Disposed of by commercial waste disposal service (see also Item 4 below).

☐ Other (specify): \_\_\_\_\_

4. The commercial waste disposal service used will be

\_\_\_\_\_  
(Name) (City, State)

NRC/Agreement State License No. \_\_\_\_\_

Item #18  
Page 1 of 1  
Prepared 5/23/85  
Lic. #24-18814-01

The following hospitals have agreed to accept patients containing radioactive material:

St. Francis Hospital  
211 St. Francis Drive  
Cape Girardeau, Missouri 63701

Southeast Hospital  
1701 Lacey Street  
Cape Girardeau, Missouri 63701

Item #25  
page 1 of 3  
prepared 5/23/85  
license #24-18814-01

Model Program for Maintaining Occupational  
Radiation Exposures at Medical Institutions ALARA

Internal Medicine Group of Cape Girardeau  
(Licensee's Name)

May 28, 1985  
(Date)

I. Management Commitment

- a. We, the management of this (medical facility, hospital, etc.) are committed to the program described in this paper for keeping exposures (individual and collective) as low as reasonably achievable (ALARA). In accord with this commitment, we hereby describe an administrative organization for radiation safety and will develop the necessary written policy, procedures and instructions to foster the ALARA concept within our institution. The organization will include a Radiation Safety Committee (RSC)<sup>1</sup> and a Radiation Safety Officer (RSO).
- b. We will perform a formal annual review of the radiation safety program including ALARA considerations. This shall include reviews of operating procedures and past exposure records, inspections, etc., and consultations with the radiation protection staff or outside consultants.
- c. Modification to operating and maintenance procedures and to equipment and facilities will be made where they will reduce exposures unless the cost, in our judgement, is considered to be unjustified. We will be able to demonstrate, if necessary, that improvements have been sought, that modifications have been considered, and that they have been implemented where reasonable. Where modifications have been recommended but not implemented, we will be prepared to describe the reasons for not implementing them.
- d. In addition to maintaining doses to individuals as far below the limits as is reasonably achievable, the sum of the doses received by all exposed individuals will also be maintained at the lowest practicable level. It would not be desirable, for example, to hold the highest doses to individuals to some fraction of the applicable limit if this involved exposing additional people and significantly increasing the sum of radiation doses received by all involved individuals.

<sup>1</sup> Private practice physician licenses do not include a RSC.

## II. Radiation Safety Committee (RSC)<sup>2</sup>

### a. Review of Proposed Users and Uses

1. The RSC will thoroughly review the qualifications of each applicant with respect to the types and quantities of materials and uses for which he has applied to assure that the applicant will be able to take appropriate measures to maintain exposure ALARA.
2. When considering a new use of byproduct material, the RSC will review the efforts of the applicant to maintain exposure ALARA. The user should have systematized procedures to ensure ALARA, and shall have incorporated the use of special equipment such as syringe shields, rubber gloves, etc., in his proposed use.
3. The RSC will ensure that the user justifies his procedures and that dose will be ALARA (individual and collective).

### b. Delegation of Authority

(The judicious delegation of RSC authority is essential to the enforcement of an ALARA program.)

1. The RSC will delegate authority to the RSO for enforcement of the ALARA concept.
2. The RSC will support the RSO in those instances where it is necessary for the RSO to assert his authority. Where the RSO has been overruled, the Committee will record the basis for its action in the minutes of the Committee's quarterly meeting.

### c. Review of ALARA Program

1. The RSC will encourage all users to review current procedures and develop new procedures as appropriate to implement the ALARA concept.

---

<sup>2</sup> The RSO on private practice physician licenses will assume the responsibilities of the RSC under Section II.



2. The RSC will perform a quarterly review of occupational radiation exposure with particular attention to instances where Investigational Levels in Table I below are exceeded. The principle purpose of this review is to assess trends in occupational exposure as an index of the ALARA program quality and to decide if action is warranted when Investigational Levels are exceeded (see paragraph VI).<sup>3</sup>
3. The RSC will evaluate our institution's overall efforts for maintaining exposures ALARA on an annual basis. This review will include the efforts of the RSO, authorized users, and workers as well as those of management.

### III. Radiation Safety Officer (RSO)

#### a. Annual and Quarterly Review

1. Annual review of the Radiation Safety Program. The RSO will perform an annual review of the Radiation Safety Program for adherence to ALARA concepts. Reviews of specific procedures may be conducted on a more frequent basis.
2. Quarterly review of Occupational Exposures. The RSO will review at least quarterly the external radiation exposures of authorized users and workers to determine that their exposures are ALARA in accordance with the provisions of paragraph VI of this program.
3. Quarterly review of records of Radiation Level Surveys. The RSO will review radiation levels in unrestricted and restricted areas to determine that they were at ALARA levels during the previous quarter.

#### b. Education Responsibilities for an ALARA Program

1. The RSO will schedule briefings and educational sessions to inform workers of ALARA program efforts.
2. The RSO will assure that authorized users, workers and ancillary personnel who may be exposed to radiation will be instructed in the ALARA philosophy and informed that management, the RSC and the RSO are committed to implementing the ALARA concept.

---

<sup>3</sup>The NRC has emphasized that the Investigational Levels in this program are not new dose limits but, as noted in ICRP Report 26, "Recommendations of the International Commission on Radiological Protection", serve as check points above which the results are considered sufficiently important to justify further investigation.

c. Cooperative Efforts for Development of ALARA Procedures

1. The RSO will be in close contact with all users and workers in order to develop ALARA procedures for working with radioactive materials.
2. The RSO will establish procedures for receiving and evaluating the suggestions of individual workers for improving health physics practices and encourage the use of those procedures.

d. Reviewing Instances of Deviation from Good ALARA Practices

The RSO will investigate all known instances of deviation from good ALARA practices; and, if possible, determine the causes. When the cause is known, the RSO will require changes in the program to maintain exposures ALARA.

IV. Authorized Users

a. New Procedures Involving Potential Radiation Exposures

1. The authorized user will consult with, and receive the approval of, the RSO and/or RSC during the planning stage before using radioactive materials for a new procedure.
2. The authorized user will evaluate all procedures before using radioactive materials to ensure that exposures will be kept ALARA. This may be enhanced through the application of trial runs.

b. Responsibility of the Authorized User to Those He Supervises

1. The authorized user will explain the ALARA concept and his commitment to maintain exposures ALARA to all of those he supervises.
2. The authorized user will ensure that those under his supervision who are subject to occupational radiation exposure are trained and educated in good health physics practices and in maintaining exposures ALARA.

V. Persons Who Receive Occupational Radiation Exposure

- a. The worker will be instructed in the ALARA concept and its relationship to his working procedures and work conditions.
- b. The worker will know what recourses are available if he feels that ALARA is not being promoted on the job.

VI. Establishment of Investigational Levels in Order to Monitor Individual Occupational External Radiation Exposures

This institution (or private practice) hereby establishes Investigational Levels for occupational external radiation exposure which, when exceeded, will initiate review or investigation by the Radiation Safety Committee and/or the Radiation Safety Officer. The Investigational Levels that we have adopted are listed in Table I below. These levels apply to the exposure of individual workers.

TABLE 1

Investigational levels - (mrems per calendar quarter)		
	<u>LEVEL I</u>	<u>LEVEL II</u>
1. Whole body; head and trunk; active blood-forming organs; lens of eyes; or gonads	125	375
2. Hands and forearms; feet and ankles	1875	5625
3. Skin of whole body*	750	2250

\*Not normally applicable to nuclear medicine operations except those using significant quantities of beta emitting isotopes.

The Radiation Safety Officer will review and record on Form NRC-5, Current Occupational External Radiation Exposures, or an equivalent form (e.g. dosimeter processor's report), results of personnel monitoring, not less than once in any calendar quarter, as is required by 10 CFR 20, §20.401. The following actions will be taken at the Investigational Levels as stated in Table 1:

- a. Quarterly exposure of individuals to less than Investigational Level I.

Except when deemed appropriate by the RSO, no further action will be taken in those cases where an individual's exposure is less than Table I values for the Investigational Level I.

- b. Personnel exposures equal to or greater than Investigational Level I, but less than Investigational Level II.

The RSO will review the exposure of each individual whose quarterly exposures equal or exceed Investigational Level I. He will report the results of his reviews at the first RSC meeting following the quarter when the exposure was recorded. If the exposure does not equal or exceed Investigational Level II, no action related specifically to the exposure is required unless deemed appropriate by the Committee. The Committee will, however, consider each such exposure in comparison with those of others performing similar tasks as an index of ALARA program quality and will record the review in the Committee minutes.

c. Exposure equal to or greater than Investigational Level II.

The RSO will investigate in a timely manner the cause(s) of all personnel exposures equaling or exceeding investigational Level II and, if warranted, take action. A report of the investigation, actions taken, if any, and a copy of the individual's Form MRC-5 or its equivalent will be presented to the RSC at the first RSC meeting following completion of the investigation. The details of these reports will be recorded in the Committee minutes. Committee minutes will be sent to the management of this institution for review. The minutes, containing details of the investigation, will be made available to NRC inspectors for review at the time of the next inspection.

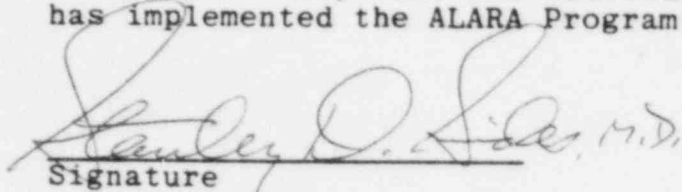
d. Re-establishment of an individual occupational worker's Investigational Level II Above That Listed in Table I.

In cases where a worker's or a group of worker's exposures need to exceed Investigational Level II, a new, higher Investigational Level II may be established on the basis that it is consistent with good ALARA practices for that individual or group. Justification for a new Investigational Level II will be documented.

The Radiation Safety Committee will review the justification for, and will approve, all revisions of Investigational Levels II. In such cases, when the exposure equals or exceeds the newly established Investigational Level II, those actions listed in paragraph c above will be followed.

VII. Signature of Certifying Official<sup>4</sup>

I hereby certify that his institution (or private practice),  
has implemented the ALARA Program set forth above.

  
Signature

Stanley D. Sides, M.D.  
Name (print of type)

President  
Title

Institution (or Private Practice) Name and Address:

Internal Medicine Group of Cape Girardeau  
14 Doctors' Park  
Cape Girardeau, MO 63701

<sup>4</sup>The individual who is authorized to make commitments for the  
administration of the institution (e.g., hospital administrator,  
etc.) or, in the case of private practice the licensed physician.