

FORM NRC-313M (8-78) 10 CFR 35	U.S. NUCLEAR REGULATORY COMMISSION <b>APPLICATION FOR MATERIALS LICENSE – MEDICAL</b>	Approved: GAO R0557
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**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.

1.a. NAME AND MAILING ADDRESS OF APPLICANT (institution, firm, clinic, physician, etc.) INCLUDE ZIP CODE  Nuclear Medicine Service Veteran's Administration Hospital 600 South 70th Street Lincoln, Nebraska 68510 TELEPHONE NO.: AREA CODE (402) 489 - 3802	1.b. STREET ADDRESS(ES) AT WHICH RADIOACTIVE MATERIAL WILL BE USED (If different from 1.a.) INCLUDE ZIP CODE  <div style="text-align: right; font-weight: bold;">RECEIVED</div>
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2. PERSON TO CONTACT REGARDING THIS APPLICATION  Erwin D. Zeman, M.D. ext. 219 TELEPHONE NO.: AREA CODE (402) 489 - 3802	3. THIS IS AN APPLICATION FOR: (Check appropriate item) a. <input type="checkbox"/> NEW LICENSE b. <input type="checkbox"/> AMENDMENT TO LICENSE NO. 5 c. <input checked="" type="checkbox"/> RENEWAL OF LICENSE NO. 26-16293-01
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4. INDIVIDUAL USERS (Name individuals who will use or directly supervise use of radioactive material. Complete Supplements A and B for each individual.)  Erwin D. Zeman, M.D. For training and experience see previous license No. 26-16293-01	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.)  Herman W. Knoche, Ph.D. <i>consultant</i> For training and experience see previous license No. 26-16293-01
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6.a. RADIOACTIVE MATERIAL FOR MEDICAL USE			
RADIOACTIVE MATERIAL LISTED IN:	ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)	<div style="display: flex; justify-content: space-between;"> <div>ADDITIONAL ITEMS:</div> <div>MARK ITEMS DESIRED "X"</div> <div>MAXIMUM POSSESSION LIMITS (In millicuries)</div> </div>
10 CFR 31.11 FOR IN VITRO STUDIES	x	2 curies	IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM <div style="text-align: right;">x one-half curie <i>No</i></div>
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		AS NEEDED	PHOSPHORUS-32 AS COLLOIDAL CHROMIC PHOSPHATE FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.
10 CFR 35.100, SCHEDULE A, GROUP III	x	2 curies	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			x 1 curie <i>No</i>
			x 2 curies

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
<div style="display: flex; justify-content: space-between;"> <div>             8507190558 850617              REG4 LIC30              26-16293-01           </div> <div>             PDR           </div> </div> <div style="text-align: right; font-size: 1.5em; font-weight: bold; margin-top: 20px;">03229</div>			

# 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: January, 1979

7. MEDICAL ISOTOPES COMMITTEE		15. GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIAL (Check One)	
<input checked="" type="checkbox"/>	Names and Specialties Attached; and	<input checked="" type="checkbox"/>	Appendix G Rules Followed; or
<input checked="" type="checkbox"/>	Duties as in Appendix B; or (Check One)		Equivalent Rules Attached
	Equivalent Duties Attached	16. EMERGENCY PROCEDURES (Check One)	
8. TRAINING AND EXPERIENCE			Appendix H Procedures Followed; or
<input checked="" type="checkbox"/>	Supplements A & B Attached for Each Individual User; and	<input checked="" 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 checked="" type="checkbox"/>	Appendix I Procedures Followed; or
<input checked="" type="checkbox"/>	Appendix C Form Attached; or		Equivalent Procedures Attached
	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)		Equivalent Information Attached
	Equivalent Procedures Attached; and	19. THERAPEUTIC USE OF RADIOPHARMACEUTICALS (Check One)	
<input checked="" type="checkbox"/>	Appendix D Procedures Followed for Dose Calibrator; or (Check One)	<input checked="" type="checkbox"/>	Appendix K Procedures Followed; or
	Equivalent Procedures Attached		Equivalent Procedures Attached
11. FACILITIES AND EQUIPMENT		20. THERAPEUTIC USE OF SEALED SOURCES NA	
<input checked="" type="checkbox"/>	Description and Diagram Attached		Detailed Information Attached; and
12. PERSONNEL TRAINING PROGRAM			Appendix L Procedures Followed; or (Check One)
<input checked="" type="checkbox"/>	Description of Training Attached		Equivalent Procedures Attached
13. PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL		21. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE GASES (e.g., Xenon - 133)	
<input checked="" type="checkbox"/>	Detailed Information Attached	<input checked="" 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 NA	
			Detailed Information Attached
<input checked="" type="checkbox"/>	Appendix F Procedures Followed; or	23. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b	
	Equivalent Procedures Attached		Detailed Information Attached NA

## 24. PERSONNEL MONITORING DEVICES

TYPE <small>(Check appropriate box)</small>		SUPPLIER	EXCHANGE FREQUENCY
a. WHOLE BODY	FILM	ICN LABORATORIES	MONTHLY
	TLD		
	OTHER <i>(Specify)</i>		
b. FINGER	FILM	ICN LABORATORIES	MONTHLY
	TLD		
	OTHER <i>(Specify)</i>		
c. WRIST	FILM	ICN LABORATORIES	MONTHLY
	TLD		
	OTHER <i>(Specify)</i>		

d. OTHER *(Specify)*

## 25. FOR PRIVATE PRACTICE APPLICANTS ONLY

a. HOSPITAL AGREEING TO ACCLPT PATIENTS CONTAINING RADIOACTIVE MATERIAL			
NAME OF HOSPITAL		b. ATTACH A COPY OF THE AGREEMENT LETTER SIGNED BY THE HOSPITAL ADMINISTRATOR.	
MAILING ADDRESS		c. WHEN REQUESTING THERAPY PROCEDURES, ATTACH A COPY OF RADIATION SAFETY PRECAUTIONS TO BE TAKEN AND LIST AVAILABLE RADIATION DETECTION INSTRUMENTS	
CITY	STATE	ZIP CODE	

## 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 <small>(See Section 170.31, 10 CFR 170)</small>  <u>170.11 (a) NO. 4</u>	b. APPLICANT OR CERTIFYING OFFICIAL <i>(Signature)</i>  (1) NAME <i>(Type of Print)</i> <u>ERWIN D. ZEMAN, M.D.</u> (2) TITLE <u>CHIEF NUCLEAR MEDICINE SERVICE</u>
(1) LICENSE FEE CATEGORY:	c. DATE <u>3-18-80</u>
(2) LICENSE FEE ENCLOSED: \$ _____	

## 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 Form NRC-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.

RADIOISOTOPE AND RADIATION SAFETY COMMITTEE

- I. PURPOSE: To establish a radioisotope and radiation safety committee in accordance with NRC Byproduct License regulations.
- II. POLICY: To insure compliance with the conditions of all NRC Byproduct Licenses held by this V.A. Hospital.
- III. PROCEDURE: The members of the radioisotope and radiation safety committee will be composed of the following individuals:
- CHAIRMAN: E.D. Zeman, M.D., Chief, Nuclear Medicine Service
- MEMBER: J.A. Hopkins, M.D., Chief, Medical Service *Int Med*
- MEMBER: R.E. Collins, M.D., Radiologist for Nuclear Medicine
- MEMBER: C.R. Mota, M.D., Chief of Surgery *Genl Surgery*
- MEMBER: H.W. Knoche, Ph.D., Professor Biochemistry and head lab of Agriculture Biochemistry at the University of Nebraska - Lincoln; Radiation Safety Officer.
- IV. DUTIES AND RESPONSIBILITIES: As followed in Appendix B, Regulatory guide dated January, 1979.



## PRECEPTOR STATEMENT

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

1. APPLICANT PHYSICIAN'S NAME AND ADDRESS		KEY TO COLUMN C  PERSONAL PARTICIPATION SHOULD CONSIST OF:  1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage.  2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data.  3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.
FULL NAME		
Erwin D. Zeman, M.D.		
STREET ADDRESS		
Veteran's Administration Hospital		
600 South 70th Street		
CITY	STATE	ZIP CODE
Lincoln	NE	68510

## 2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION		SEE PREVIOUS LICENSE NO. 26-16293-01 Continuous education and training since 1979.
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME		
	LIVER FUNCTION STUDIES		
	FAT ABSORPTION STUDIES		
	KIDNEY FUNCTION STUDIES		
	IN VITRO STUDIES		
OTHER			
I-125	DETECTION OF THROMBOSIS		
I-131	THYROID IMAGING		
P-32	EYE TUMOR LOCALIZATION		
Se-75	PANCREAS IMAGING		
Yb-169	CISTERNOGRAPHY		
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES		
OTHER			
Tc-99m	BRAIN IMAGING		
	CARDIAC IMAGING		
	THYROID IMAGING		
	SALIVARY GLAND IMAGING		
	BLOOD POOL IMAGING		
	PLACENTA LOCALIZATION		
	LIVER AND SPLEEN IMAGING		
	LUNG IMAGING		
	BONE IMAGING		
OTHER			

# PRECEPTOR STATEMENT (Continued)

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

ISOTOPE	CONDITIONS DIAGNOSED OR TREATED	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.)
A	B	C	D
P-32 (Soluble)	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA, AND BONE METASTASES		SEE PREVIOUS LICENSE NO. 26-16293-01 Continuous <del>training</del> and education since 1959.
P-32 (Colloidal)	INTRACAVITARY TREATMENT		
I-131	TREATMENT OF THYROID CARCINOMA		
	TREATMENT OF HYPERTHYROIDISM		
Au-198	INTRACAVITARY TREATMENT		
Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	INTRACAVITARY TREATMENT		
I-125 or Ir-192	INTERSTITIAL TREATMENT		
	TELE THERAPY TREATMENT		
Co-60 or Cs-137	TELE THERAPY TREATMENT		
	TREATMENT OF EYE DISEASE		
Sr-90	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR		
Sn-113/ In-113m	GENERATOR		
Tc-99m	REAGENT KITS		
Other			

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

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

a. NAME OF SUPERVISOR

b. NAME OF INSTITUTION

c. MAILING ADDRESS

d. CITY

5. MATERIALS LICENSE NUMBER(S)

6. PRECEPTOR'S SIGNATURE

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

8. DATE

**TRAINING AND EXPERIENCE  
AUTHORIZED USER OR RADIATION SAFETY OFFICER**

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER  Erwin D. Zeman, M.D.	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE Iowa - Nebraska
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3. CERTIFICATION		
SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C
American Board of Nuclear Medicine	Nuclear Medicine	October 27, 1976
American Board of Pathology	Radioisotopic Pathology (PA-CP)	May of 1976

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	SEE PREVIOUS LICENSE NO. 26-16293-01		
b. RADIATION PROTECTION	"		
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	"		
d. RADIATION BIOLOGY	"		
e. RADIOPHARMACEUTICAL CHEMISTRY	"		

5. EXPERIENCE WITH RADIATION. (Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
		SEE PREVIOUS LICENSE NO. 26-16293-01		
				03229



**TRAINING AND EXPERIENCE  
AUTHORIZED USER OR RADIATION SAFETY OFFICER**

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER

Herman W. Knoche, Ph.D.; Radiation Safety Officer

2. STATE OR TERRITORY IN  
WHICH LICENSED TO  
PRACTICE MEDICINE

**3. CERTIFICATION**

SPECIALTY BOARD  
A

CATEGORY  
B

MONTH AND YEAR CERTIFIED  
C

SEE PREVIOUS LICENSE  
NO. 26-16293-01

**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

SEE PREVIOUS LICENSE

b. RADIATION PROTECTION

"

c. MATHEMATICS PERTAINING TO  
THE USE AND MEASUREMENT  
OF RADIOACTIVITY

"

d. RADIATION BIOLOGY

"

e. RADIOPHARMACEUTICAL  
CHEMISTRY

"

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

ISOTOPE

MAXIMUM AMOUNT

WHERE EXPERIENCE WAS GAINED

DURATION OF EXPERIENCE

TYPE OF USE

SEE PREVIOUS LICENSE

APPENDIX C  
INSTRUMENTATION

1. Survey meters

- a. Manufacturer's name: Searle (Texas-Nuclear Corp.)  
Manufacturer's model number: 9120  
Number of instruments available: 1  
Minimum range: 0.02 mr/hr to \_\_\_\_\_ mr/hr  
Maximum range: \_\_\_\_\_ mr/hr to 200 mr/hr
- b. Manufacturer's name: Reactor Experiments, Inc.  
Manufacturer's model number: NA  
Number of instruments available: 1  
Minimum range 0.1 mr/hr to \_\_\_\_\_ mr/hr  
Maximum range \_\_\_\_\_ mr/hr to 99.9 ~~mr/hr~~ R/hr

2. Dose calibrator

Manufacturer's name: Nuclear-Chicago  
Manufacturer's model number: 6372  
Number of instruments available: 1

3. Diagnostic instruments

<u>Type of Instrument</u>	<u>Manufacturer's Name</u>	<u>Model No.</u>
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REFER TO ATTACHMENT

4. Other

INSTRUMENTATION  
(Attachment to Appendix C)

- I. Searle Pho-Gamma IV Gamma Camera, Searle Radiographics Inc., Des Plaines, Illinois, with following collimators:
  - a. 140 Kev High Resoulution No. 820-821742
  - b. 140 Kev High Sensitivity No. 820-821713
  - c. 140 Kev Divcon Diverging/Converging No. 820-822017
  - d. 410 Kev Diverging No. 820-821516
  - e. Single Pinhole No. 820-820728
- II. Searle Micro-dot Imager Model No. 3132
- III. Searle Data-Store/Playback system included with Pho-Gamma IV Camera.
- IV. Nuclear-Chicago Historecorder Model No. SS-10125
- V. Hewlett-Packard Oscilloscope Model No. H11-1208A
- VI. Searle Gamma Scintillation Well Counting System Model No. 1185
- VII. Physiological Synchronizer, Model 202, Brattle Instrument Corporation, Cambridge, Mass.
- VIII. Nuclear-Chicago Thyroid Probe Model 1786
- IX. Nuclear-Chicago Thyroid Phantom Model 3109

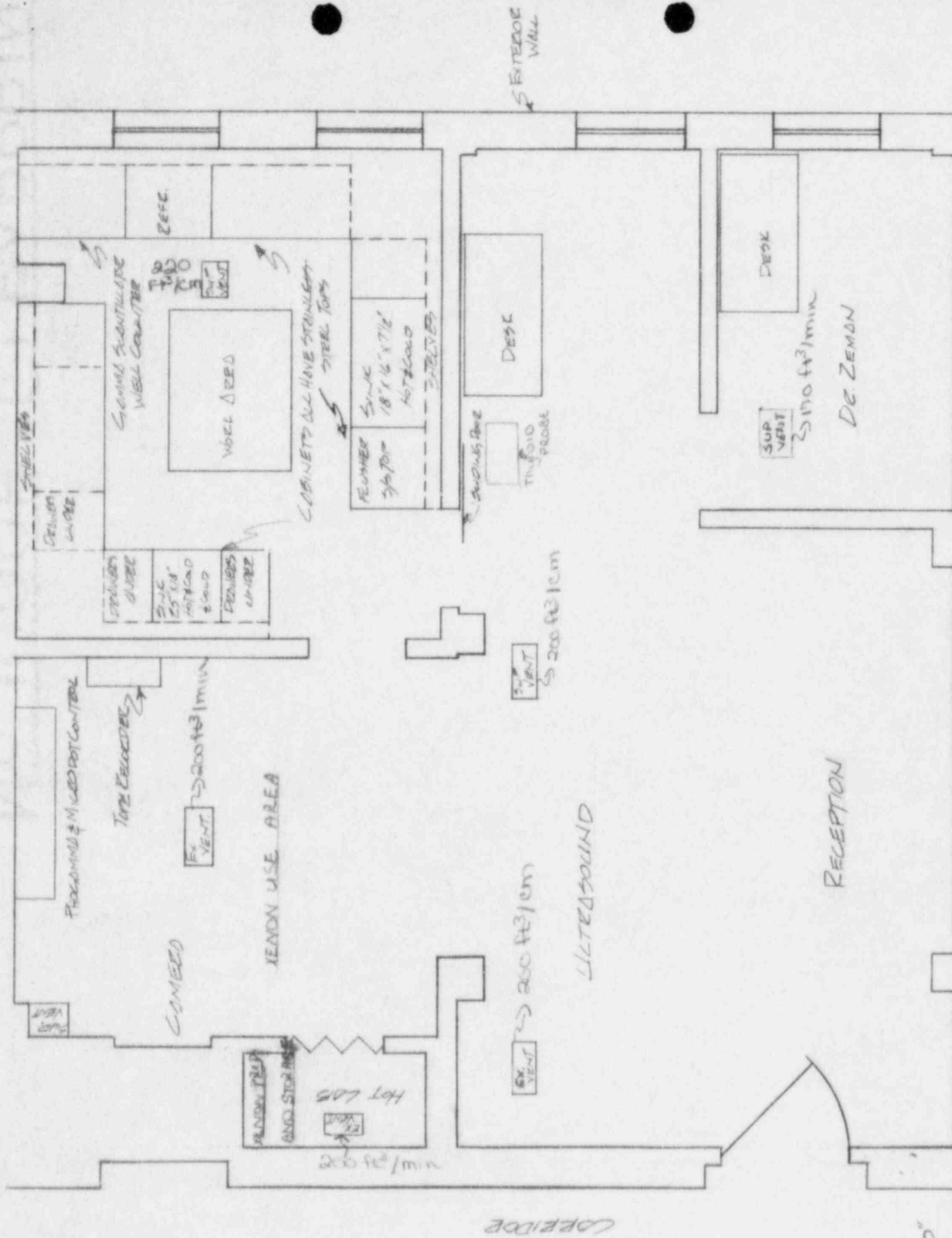


DIAGRAM OF NUCLEAR MEDICINE SERVICE

ITEM NO. 11  
MARCH, 1980

SCALE 1/4" = 1'-0"

PERSONNEL TRAINING

- A. Principles and Practices of Radiation Protection
- B. Radioactivity Measurements, Standardization and Monitoring Techniques and Instruments
- C. Mathematics and Calculations Basic To Use and Measurement of Radioactivity
- D. Biological Effects of Radiation
- E. Experience with Radiation

<u>NAME</u>	<u>WHERE TRAINED</u>	<u>DURATION OF TRAINING</u>	<u>ON THE JOB</u>	<u>FORMAL COURSE</u>
Erwin D. Zeman, M.D.	*(SEE PREVIOUS LICENSE, CONTINUING EXPERIENCE AND EDUCATION)			
Pamela S. Schulte Registered Technologist American Registry of Radiologic Technologists	University of Nebraska Medical Center; Omaha Nebraska	2 years	No	Yes

\*Board Licensure in American Board of Pathology &  
American Board of Nuclear Medicine



RECEIPT AND DELIVERY OF RADIOACTIVE MATERIAL

1. PURPOSE: To assure that radioactive materials are secured against unauthorized removal.
2. POLICY: To follow special instructions for the receipt and delivery of radioactive materials.
3. RESPONSIBILITY: If there is any question or problem concerning parcels containing radioactive materials, please call the people listed below in the following order:

A. Pamela S. Schulte, R.T.

Home: 467-1854 Lincoln  
Office: ext. 219 V.A. Hospital

B. E.D. Zeman, M.D.

Home: 483-5121 Lincoln  
Office: ext. 219 V.A. Hospital

4. PROCEDURES: The following procedures will be followed at all times as listed below:

A. RECEIPT OF PARCELS:

(1) Normal Duty Hours:

- (a) Incoming parcels containing radioactive materials will be delivered by the transporter to the supply receiving dock where they will be either delivered immediately to Bldg. 1, Lower Level, Room 17, to the Nuclear Medicine Service or Supply Service will keep it under lock and key until delivery.

(2) Off-duty Hours:

- (a) Incoming parcels containing radioactive materials will be delivered to the VA Hospital switchboard operator who will immediately notify the VA Hospital Police officer on duty for delivery to the Nuclear Medicine Service.
- (b) The switchboard operator will keep the parcel(s) under surveillance until it is turned over to the VA Hospital Police Officer who will immediately deliver it to the Nuclear Medicine Service.
- (c) No parcel(s) containing radioactive material are to remain in the switchboard area for any extensive length of time.
- (d) The Supply Warehouse will be notified by the Chief, Nuclear Medicine Service, of any parcels received during other than normal working hours. This notification should be made immediately upon commencement of warehouse working hours.

RECEIPT AND DELIVERY OF RADIOACTIVE MATERIAL (CON'T.)

B. DELIVERY OF PARCELS

(1) Normal duty hours:

- (a) Parcels will be delivered to the Nuclear Medicine Service by Supply Warehouse personnel and signed for by authorized Nuclear Medicine personnel.

(2) Off-duty hours:

- (a) All parcels are to be delivered by the VA Hospital police officer to the Nuclear Medicine Service Laboratory in Bldg. 1, Lower level, Room 17, and will be placed next to the lead bricks on the counter in the isotope storage room.
- (b) If the parcel is labeled "TO BE REFRIGERATED" it is to be placed in the large upright household refrigerator in the Nuclear Medicine room.
- (c) Unless specifically labeled or instructed, the parcels are not to be placed in the freezer compartment of the refrigerator.
- (d) No parcels containing radioactive material will be stored in any other area of this VA Hospital without the prior consent of the Chief, Nuclear Medicine Service or the Radiation Safety Officer or his designee.

EMERGENCY PROCEDURES FOR THE  
USE OF RADIOACTIVE MATERIALS

Emergencies will generally be in the nature of spills, fires, or explosions, as a result of which radioactive materials are spread around the installation. Procedures to be followed in the case of any of the above are listed below:

A. Major Spills Involving Radiation Hazards to Personnel.

1. Notify all persons not involved in the spill to vacate the room at once. Limit the movement of displaced persons to confine the spread of contamination.
2. If the spill is liquid and the hands are protected, right the container, otherwise use a stick or lever.
3. If the spill is on the skin, flush thoroughly.
4. If the spill is on clothing, discard outer or protective clothing at once.
5. Switch off all fans.
6. Vacate the room.
7. Notify the Radiation Safety Officer as soon as possible.
8. Take immediate steps to decontaminate personnel involved, as necessary.
9. Decontaminate the area. (Personnel involved in decontamination must be adequately protected.) The Radiation Safety Officer will direct the decontamination.
10. Monitor all persons involved in the spill and cleaning.
11. Permit no person to resume work in the area without the approval of the Radiation Safety Officer.
12. A complete history of the accident and subsequent activity must be submitted to the Radiation Safety Officer.

EMERGENCY PROCEDURES FOR THE  
USE OF RADIOACTIVE MATERIALS  
(CON'T.)

B. Minor Spills Involving No Radiation Hazard To Personnel.

1. Notify all other persons in the room and area at once.
2. Survey people before they become dispersed and change clothes as necessary.
3. Permit only the minimum number of persons necessary to deal with the spill into the area.
4. Confine the spill immediately.
  - (a) Liquid spills:
    - (1) Don protective gloves.
    - (2) Drop absorbent paper on spill.
  - (b) Dry spills:
    - (1) Don protective gloves.
    - (2) Dampen thoroughly, taking care not to spread the contamination. Water may generally be used except where chemical reaction with the water would generate an air contamination. Oil should then be used.
5. Decontaminate. Make a plan first.
6. A complete history of the accident and subsequent remedial or protective measures must be submitted to the Radiation Safety Officer.

C. Fires Or Other Major Emergencies.

1. Notify all other persons in the room and building at once.
2. Notify the fire department and other local plant safety personnel and the Radiation Safety Officer and have someone present to meet the notified officials and appraise them of the placement of radioactivity.
3. Attempt to put out fires by approved means if radiation hazard is

EMERGENCY PROCEDURE (CON'T.)

3. (con't.) not immediately present.
4. Govern fire fighting or other emergency activities by the restrictions of the Radiation Safety Officer. Avoid, if possible, the tracking of contamination or passing of contaminated equipment into clean areas by emergency workers.
5. Monitor all persons involved in combating the emergency.
6. Following the emergency, monitor the area and determine the protective devices necessary for safe decontamination.
7. Decontaminate. Follow a plan.
8. Permit no person to return to work without the approval of the Radiation Safety Officer.
9. Prepare a complete history of the emergency and subsequent activity related thereto for the Radiation Safety Officer.



APPENDIX J

WASTE DISPOSAL

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

\_\_\_\_\_ By commercial waste disposal service (see also item 4 below).

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

\_\_\_\_\_ Other (specify): \_\_\_\_\_

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

X Returned to the manufacturer for disposal.

\_\_\_\_\_ Held for decay until radiation levels, as measured 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 disposed of as normal trash. (Note: This method of disposal may not be practical for generators containing long-lived radioactive contaminants.)

\_\_\_\_\_ Disposed of by commercial waste disposal service (see also item 4 below).

\_\_\_\_\_ Other (specify): \_\_\_\_\_

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

X Held for decay until radiation levels, as measured 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) \_\_\_\_\_

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