NRC FORM 313M (9-81) 10 CFR 35	U.S. NUCLEAR REGULATORY COMMISSION APPLICATION FOR MATERIALS LICENSE -- MEDICAL	Approved by OMB 3150-0041 Expires 9-30-86

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

CENTRAL PLAINS CLINIC
2727 S KIWANIS
SIOUX FALLS, SD 57105

TELEPHONE NO.: AREA CODE (605) 331 3150

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

CENTRAL PLAINS CLINIC
2727 S KIWANIS
SIOUX FALLS, SD 57105

(130-29708) LTL 26865

2. PERSON TO CONTACT REGARDING THIS APPLICATION

MAURICE A. TAJIRAN, M.S.

TELEPHONE NO.: AREA CODE (605) 336 0515

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

a. [X] NEW LICENSE
b. [ ] AMENDMENT TO LICENSE NO. _____
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.)*

SEE ATTACHED

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.)*

MAURICE A. TAJIRAN, M.S.

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	X	AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP II	X	AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP III	X	2000
10 CFR 35.100, SCHEDULE A, GROUP IV	X	AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP V		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP VI		

ADDITIONAL ITEMS:	MARK ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS *(In millicuries)*
IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM	X	
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	
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

8710070601

46-1345

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 N/A specific license limited scope	
	Names and Specialties Attached; and
	Duties as in Appendix B; or *(Check One)*
	Equivalent Duties Attached
8. TRAINING AND EXPERIENCE	
X	Supplements A & B Attached for Each Individual User; and
X	Supplement A Attached for RSO.
9. INSTRUMENTATION *(Check One)*	
X	Appendix C Form Attached; or
	List by Name and Model Number
10. CALIBRATION OF INSTRUMENTS	
X	Appendix D Procedures Followed for Survey Instruments; or *(Check One)*
	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)*	
X	Appendix F Procedures Followed; or
	Equivalent Procedures Attached

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

d. OTHER (Specify)

Log Jan-7-IV
Remitter
Check No. 69021
Amount $580
Fee Category 7C
Type of Fee A-pp
Date Check Rec'd. 1/21/87
Date Completed 1/20/87
By: Hussin

25. FOR PRIVATE PRACTICE APPLICANTS ONLY

a. HOSPITAL AGREEING TO ACCEPT PATIENTS CONTAINING RADIOACTIVE MATERIAL

NAME OF HOSPITAL
McKennan Hospital/Sioux Valley Hospital

MAILING ADDRESS
Addresses attached

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 7C

(2) LICENSE FEE ENCLOSED $ 580

b. APPLICANT OR CERTIFYING OFFICIAL *(Signature)*

(1) NAME *(Type or Print)* ED ARSHEM

(2) TITLE ADMINISTRATOR

c. DATE 01/02/87

NRC FORM 313M (9-81)

INDIVIDUAL USERS

1. T. A. SCHULTZ, M.D.
2. M. FRANK PETERIET, M.D.
3. LELAND J. LARSON, M.D.
4. ROBERT P. DE CLARK, M.D.
5. THOMAS E. MASTERSON, M.D.
6. ANDREW I. SOYE, M.D.
7. THOMAS M. CINK, M.D.
8. JAMES L. QUALE, M.D.
9. DARYL R. WIERDA, M.D.
10. LYNN A. HENRICKSON, M.D
11. PATSY A. UKEN, M.D.

TRAINING & EXPERIENCE

The following are authorized on McKennan Hospital License # 40-16571-01.

1. T. A. Schultz, M.D.
2. M. Frank Petereit, M.D.
3. Leland J. Larson, M.D.
4. Robert P. DeClark, M.D.
5. Thomas M. Cink, M.D.
6. Andrew I. Soye, M.D.

The following are authorized on Veterans Memorial Hospital License No. 40-16336-01.

1. Thomas E. Masterson, M.D.
2. James L. Quale, M.D.
3. Daryl R. Wierda, M.D.
4. Lynn Henrickson, M.D.
5. Patsy A. Uken, M.D.

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

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE
Maurice A. Tajiran, M. S. Medical Physicist	N/A

3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION	Wayne State University MI 09/01/81 thru 12/15/83 Harper Hospital MI	80	30
b. RADIATION PROTECTION	same as above	30	20
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	same as above	20	10
d. RADIATION BIOLOGY	SAME AS ABOVE	10	0
e. RADIOPHARMACEUTICAL CHEMISTRY	SAME AS ABOVE	0	0

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	4800 Ci	EVANSTON HOSPITAL	ONE YEAR	Radiation therapy
CS-137	200 mCi	Lake Forest Hospital		
Ir-192	100 mCi	Illinois		brachetherapy and therapy
P-32	60 mCi			
I-131	200 mCi			oral
		Medical X-Ray Center, PC Sioux Falls, SD	18 Months	

APPENDIX C

INSTRUMENTATION

1. Survey meters

   a. Manufacturer's name: Atomic Products Corporation

   Manufacturer's model number: PUG - 1 052-100

   Number of instruments available: 1

   Minimum range: 0 mR/hr to 1 mR/hr

   Maximum range: 0 mR/hr to 10 mR/hr

   b. Manufacturer's name: Digital Cutie Pie Atomic Products

   Manufacturer's model number: 051-301

   Number of instruments available: 1

   Minimum range: 0 mR/hr to 200 mR/hr

   Maximum range: 0 mR/hr to 20,000 mR/hr

2. Dose calibrator

   Manufacturer's name: CAPINTEC

   Manufacturer's model number: CRC - 12

   Number of instruments available: 1

3. Instruments used for diagnostic procedures

Type of Instrument	Manufacturer's Name	Model No.
Gamma Camera	G.E.	Starcam 400 AC/T

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

CALIBRATION OF SURVEY INSTRUMENTS

Check appropriate items.

X 1. Survey instruments will be calibrated at least annually and following repair.

X 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 ± 10 percent of the calculated or known values for each point checked. Readings within ± 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 ± 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.

X c. By a consultant or outside firm

(1) Name SUNTRAC SERVICE, INC

(2) Location PO BOX 57722 WEBSTER, TEXAS 77598-0722

(3) Procedures and sources

____ have been approved by NRC and are on file in License No. _____

X 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

X 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.

TRC FORM 41-3a
(10-78)

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

2151

LICENSE NUMBER	AMENDMENT NUMBER
11-3062	3

CONDITIONS CONTINUED:

12. Certificates verifying the successful completion of the required training for each user shall be maintained by the licensee for inspection by the Agency.

13. The individual designated to perform the functions of Radiation Safety Officer for activities covered by this license is C. E. Winters, Jr.

14. Sealed sources of radioactive material, Nickel 63 foil, and/or plated alpha emitting sources shall be tested for leakage and/or contamination in accordance with the provisions of Texas Regulations for Control of Radiation 11.7.

15. Sealed sources containing radioactive material shall not be opened.

16. The licensee is authorized to perform tests for leakage and/or contamination at customer sites throughout Texas and to distribute their leak/wipe test kit Model SIT-1 to customers for the licensee's subsequent analysis. Such tests shall be capable of detecting 0.005 microcuries of contamination on the test sample and the results of such tests shall be provided to the customer in terms of microcuries.

17. The licensee is authorized to conduct a radiation safety course for users of radioactive material authorized by this license in accordance with provisions of the Texas Regulations for Control of Radiation and the application dated July 11, 1986. The individual authorized to perform the above training is C. E. Winters, Jr.

18. The licensee shall maintain, for inspection by the Agency, appropriate records for the verification of reported leak test results.

19. Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in the following:

    application dated July 11, 1986.

    The Texas Regulations for Control of Radiation shall prevail over statements contained in the above documents unless such statements are more restrictive than the regulations.

FRH:bg

FOR THE TEXAS DEPARTMENT OF HEALTH

Date August 20, 1986

Joseph O. Klinger

Administrator, Licensing Branch

TRC FORM 41-3
(10-78)

0668

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Pursuant to the Texas Radiation Control Act and Texas Department of Health regulations on radiation, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Texas Department of Health now or hereafter in effect and to any conditions specified below.

LICENSEE

1. Name: Suntrac Services, Inc.
   Attn: Mr. C. E. Winters, Jr.
2. Address: P. O. Box 57722
   Webster, Texas 77598

This license issued pursuant to and in accordance with
☒ APPLICATION ☐ LETTER ☐ _____
Dated: July 11, 1986
Signed By: C. E. Winters, Jr.

3. License Number	Amendment Number
11-3062	3

PREVIOUS AMENDMENTS ARE VOID

4. Expiration Date: August 31, 1991

RADIOACTIVE MATERIAL AUTHORIZED

5. Radioisotope	6. Form of Material	7. Maximum Activity*	8. Authorized Use
A. Any radioactive material.	A. Leak test samples.	A. Activity obtained in testing for leakage and/or ontamination.	A. Testing for leakage and/or contamination of sealed sources and devices containing sealed sources.
B. Co-60	B. Sealed source (Tracerlab Model R-31).	B. 2 sources of 1.0 mCi. each.	B. For demonstration and as check sources.

☐ CONTINUED ON PAGE 2, IF CHECKED.

CONDITIONS

9. Unless otherwise specified, radioactive material shall be stored and used at 314 Forest Lane Drive in Seabrook, Texas and temporary job sites throughout Texas.

10. The licensee shall comply with the provisions of Parts 11, 12, 13, 21, 22 and 41 of the Texas Regulations for Control of Radiation.

11. Radioactive material shall be used only by, or under the supervision of, individuals designated by the Radiation Safety Officer, only after each user has successfully completed an Agency accepted training course.

* Ci-Curies mCi-Millicuries μ Ci-Microcuries

CONDITIONS CONTINUED ON PAGE 2

TRC FORM 41-3a
(10-78)

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
11-507	16

Kenzac Communications Services
ATTN: B.J. Zachary
P.O. Box 66251
Houston, Texas 77006

In accordance with application dated July 23, 1982, signed by B.J. Zachary, License No. 11-507 is hereby amended as follows:

To change Item 4, the expiration date, from August 31, 1982 to August 31, 1987

To change Condition 14 to read:

14. Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in the following:

application dated July 23, 1982,
letter received December 1, 1976 and letter dated July 25, 1978.

The Texas Regulations for Control of Radiation shall prevail over statements contained in the above documents unless such statements are more restrictive than the regulations.

FRH:nlp

FOR THE TEXAS DEPARTMENT OF HEALTH

Date NOV 03 1982

Joseph G. Klinger

Administrator, Industrial Operations Branch

TRC FORM 41-3a
(4-76)

TEXAS DEPARTMENT OF HEALTH RESOURCES

RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

RECEIVED

OCT 26 1982

VICTOREEN MAIL ROOM

LICENSE NUMBER	AMENDMENT NO.
8-507	13

Kenzac Communications Service
6217 Edloe
P. O. Box 66251
Houston, Texas 77006

In accordance with letter received December 1, 1976, signed by B. J. Zachary, License No. 8-507 is hereby amended as follows:

To add Condition 15 to read:

15. The licensee is authorized to provide the service of calibrating radiation survey instruments for customers. Such calibrations shall be in accordance with procedures submitted to the Agency on December 1, 1976.

Date JAN 18 1977

FOR THE TEXAS DEPARTMENT OF HEALTH RESOURCES

Joseph E. Gorrell

Chief of Licensing
Radiation Control Branch

Next Calibration 4-1-87

KENZAC COMMUNICATION SERVICE

P. O. BOX 66251 HOUSTON, TEXAS 77006 PHONE 667-8813

Date 10-1-86 Make Ludlum

Model 5 Serial 1956

This instrument has been calibrated in Accordance with Texas Regulations for Radiation Control.

Signed B. J. Zachary

License- Texas 11-507

Range	Calculated	Reading
0-.02 MR/H	.16	.16
0-2 MR/H	.64	.65
	1.06	1.06
0-20 MR/H	6.04	7
	16.5	16
0-200 MR/H	34	32
	183	180
0-2000 MR/H	183	190
	927	850
MR/H		
MR/H		

SAMPLE FORM FOR INST. CALIBRATION

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	4.8 millicuries	
Ba-133	0.1-0.5		
Cs-137	0.1-0.2	.216 microcuries	
Ra-226	1-2		

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.

10. Calibration of Instruments (2)
January 2, 1987

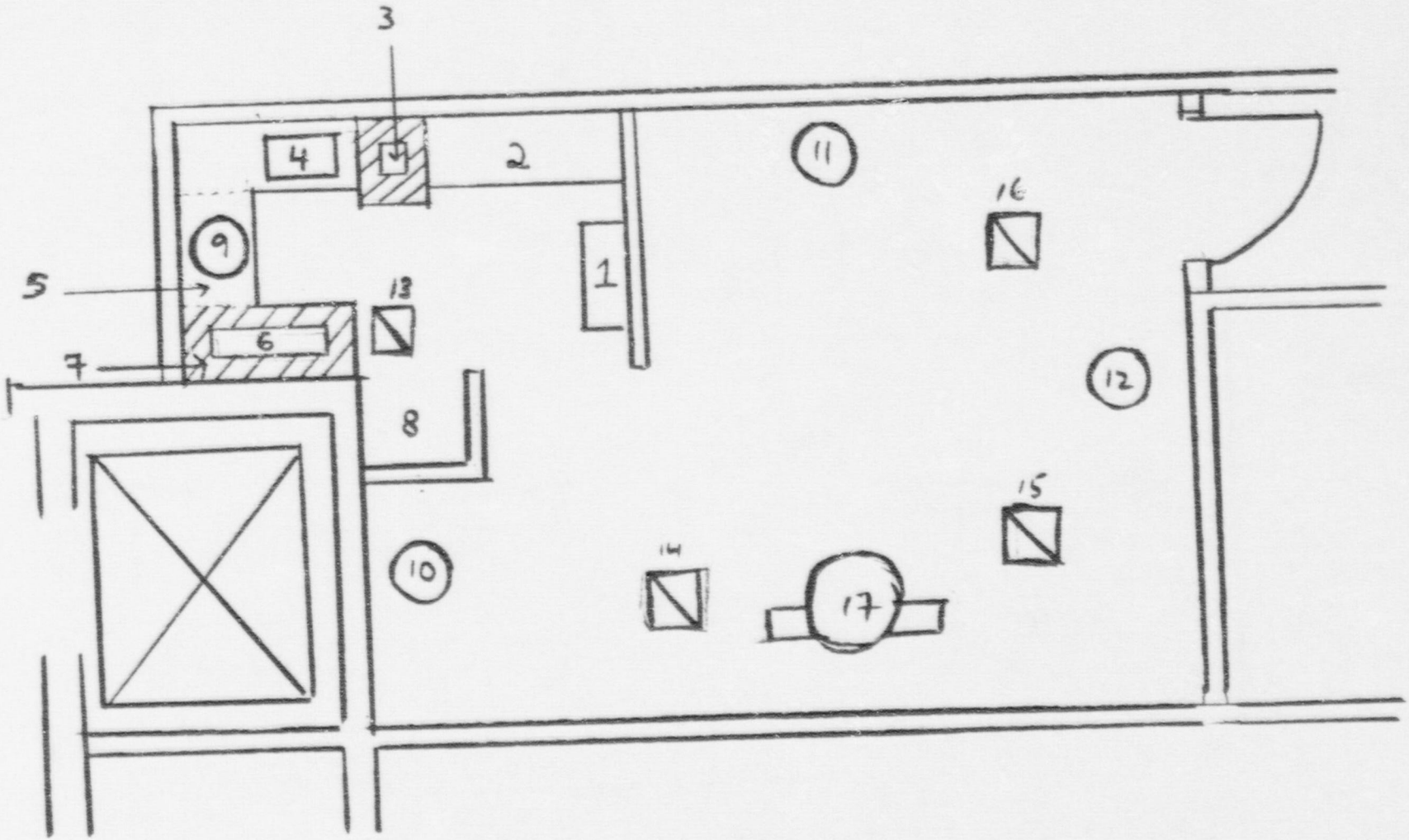
FACILITY AND EQUIPMENT

Nuclear medicine department and hot lab have a 0% recirculation rate and this air is exhausted directly to the roof which is exhausted far from windows and air intake vents.

The camera room has a measured air exhaust rate of 375 CFM and the hot lab has 450 CFM a total of 825 CFM.

The air flow for all the nuclear medicine department which includes hot lab and camera room is 400 CFM which will creat a negative pressure.

There will be no change in air flow rates between heating and cooling.



LAYOUT DIAGRAM FOR NUCLEAR MEDICINE LAB.

LAYOUT DIAGRAM NUCLEAR MEDICINE LAB

1. Dose Calibrator
2. Preperation Area
3. Lead Cabinet
4. Sink
5. Hood
6. Generator
7. Lead Lined Cabinet for Storage
8. Refrigerator
9. Exhaust Hood 450 CFM
10. Exhaust 125 CFM
11. Exhaust 125 CFM
12. Exhaust 125 CFM
13. Supply 100 CFM
14. Supply 100 CFM
15. Supply 100 CFM
16. Supply 100 CFM
17. Gamma Camera

PERSONNEL TRAINING PROGRAM

The specific training given to certain groups of individuals who may come into contact with the Nuclear Medicine Department is as stated below:

Clerical: There are no clerical personnel directly employed in the department.

Housekeeping: Housekeeping personnel will be allowed to wash and mop floors in the area, dust all ledge areas and desks, where only paper work is performed.

Technologists in the Nuclear Medicine Department will be responsible for decontaminating and cleaning of counter top areas where radioactive material is routinely used.

Maintenance Personnel: Most equipment in the Nuclear Medicine Department is serviced by company based service representatives. In the event that the refrigerators or centrifuges in the area need servicing by clinic based personnel, all radionuclides will be removed from the equipment being repaired and if possible the piece of equipment will be moved out of the area for servicing.

Nursing personnel are only allowed into the Nuclear Medicine area when imaging is done on a patient needing continuous monitoring. They are not responsible for injecting of radionuclides into patients nor for using radionuclides in any other manner.

All personnel including medical technologists, clerical, housekeeping and other individuals will be instructed in the following items prior to being allowed to work in the area:

a. Areas where radioactive material is used or stored.

b. Potential hazards associated with radioactive materials.

c. Radiological safety procedures that must be used while working in the department.

d. Rules, regulations and pertinent terms of the license.

e. Pertinent NRC regulations and where the copies of the license and pertinent regulations and conditions are posted.

f. Their obligation to report unsafe conditions.

g. Appropriate response to emergencies or unsafe conditions.

h. Their right to be informed of their radiation exposure and bioassay results.

Verification that personnel have been instructed in the above criteria before they assume duties, during annual refresher training or whenever there is a significant change in duties, regulations or the terms of the license will consist of a written record in which the person receiving the instruction states that the instruction has been given and he/she fully understands the material that has been presented.

PROCEDURE FOR ORDERING RADIOACTIVE MATERIAL

1. The Section Head, Nuclear Medicine, will be responsible for placing all orders for routine radioactive materials. He/She will determine that the requested materials and quantities are as authorized by the NRC license and that position limits are not exceeded. In the absence of the section head, Nuclear Medicine, an alternate from among the personnel in Nuclear Medicine will be designated to serve in his/her absence.

2. A written log of all material ordered will be established and maintained. Such log will identify the radionuclide ordered, the radiopharmaceutical compound as appropriate, activity levels, supplier, and date of order. When the radionuclide is received, notation as to the quantity, condition, amounts, etc. will be appropriately recorded in log book. In case of unusual radionuclides ordered, these will be authenticated by a nuclear medicine physician specifying the radionuclide ordered, the reason therefore and the amounts to be ordered.

RECEIPT OF NUCLEAR MEDICINE MATERIALS

During normal working hours, all radionuclide materials will be delivered directly to the Nuclear Medicine Department. Upon receipt, they will be immediatedly inspected for signs of leakage such as dampness of the shipping container. If such dampness is noted or the container is damaged, carriers should be instructed to remain until it is ascertained whether or not radiation leakage has occurred in accordance with procedures detailed elsewhere.

During hours when the Nuclear Medicine section is unstaffed, radionuclide packages will be delivered to the reception area of the laboratory. Reception personnel will be responsible for checking the packages for obvious damage, as outlined above, and materials will immediately be transported to the Nuclear Medicine department for storage.

Central Plains Clinic Ltd.

CPC #

January 1, 1987

MEMORANDUM

TO: Front Desk Personnel

FROM: Mr. Ed Arshem, Administrator

SUBJECT: Receipt of Packages Containing Radioactive Material

Any packages containing radioactive material that arrive between 4:30 p.m. and 10:00 p.m., or on Sundays:

Will be signed for by the front desk personnel on duty and taken immediately to the Nuclear Medicine Department. Unlock the door, place the package on top of the counter immediately to the right of the door, and relock the door.

If the package is wet or appears to be damaged, immediately contact the Radiation Safety Officer. Ask the carrier to remain at the clinic until it can be determined that neither he nor the delivery vehicle is contaminated.

Radiation Safety Officer: Maurice A. Tajiran, M.S.
Office Phone: (605) 336-0515
Home Phone: (605) 361-9321

Edward E. Arshem
Administrator

2727 South Kiwanis Avenue
Sioux Falls, South Dakota 57105
Tel. (605) 335-2727

CENTRAL PLAINS CLINIC STAFF

ALLERGY/IMMUNOLOGY - Pediatric & Adult
Thomas M. Wilson, M.D.

DERMATOLOGY
Marc A. Green, M.D.
Gene F. Burnish, M.D.

ENDOCRINOLOGY
Fred C. Lovrien, M.D.
T.A. Schultz, M.D.

FAMILY PRACTICE
Verdayne R. Brandenburg, M.D.
Christine F. Bucy, M.D.
Edward T. Clark, M.D.
Lawrence W. Finney, M.D.
William E. Held, M.D.
Michael E. Hogue, M.D.
Edward H. Peters, M.D.
Guy E. Tam, M.D.
James W. Fink, P.A.-C.

GASTROENTEROLOGY
Steve H. Gutnik, M.D.

HEMATOLOGY
Loren K. Tschetter, M.D.

INDUSTRIAL MEDICINE
Edwards H. Peters, M.D.
Guy E. Tam, M.D.
Richard J. Rather, P.A.-C.
Gary N. Wurgler, P.A.-C.

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Vincent K. Cutshall, M.D.
John W. Donahoe, M.D.
Walter G. Drymalski, M.D.
Michael R. Ferrell, M.D.
Leonard M. Gutnik, M.D.
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Wendell W. Hoffman, M.D.
Timothy E. Hurley, M.D.
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UROLOGY
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M. Cassandra Matustik, M.D.

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Marwan Hanna, M.D.

RADIOLOGY
Medical X-Ray Center

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 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 removable contamination exceeds 0.01 μCi/100 cm^2 or if external radiation levels exceed 200 mR/hr at the package surface or 10 mR/hr at 3 feet (or 1 m).

2. For all packages, the following additional procedures for opening packages will be carried out:

   a. Put on gloves to prevent hand contamination.

   b. Visually inspect package for any sign 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 m) 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) and remove packing slip.

      (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 also that shipment does not exceed possession limits.

   f. Wipe external surface of final source container and remove wipe to low background area. Assay the wipe and record amount of removable radioactivity (e.g., μCi/100 cm^2, etc.). Check wipes with a thin-end-window G-M survey meter, and take precautions against the 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, using "Radioactive Shipment Receipt Record" (see next page) or a form containing the same information.

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*In the case of special orders (e.g., therapy doses), also compare with physician's written request.

APPENDIX G

GENERAL RULES FOR SAFE USE OF RADIOACTIVE MATERIAL

1. Wear laboratory coats or other protective clothing at all times in areas where radioactive materials are used.

2. Wear disposable gloves at all times while handling radioactive materials.

3. Monitor hands and clothing for contamination after each procedure or before leaving the area.

4. Always use syringe shields for routine preparation of patient doses and administration to patients, except in circumstances such as pediatric cases when their use would compromise the patient's well-being. In these exceptional cases, use other protective methods such as remote delivery of the dose (e.g., through use of a butterfly valve).

5. a. Do not eat, drink, smoke, or apply cosmetics in any area where radioactive material is stored or used.

   b. Do not store food, drink, or personal effects with radioactive material.

6. a. Assay each patient dose in the dose calibrator prior to administration. Do not use any doses that differ from the prescribed dose by more than 10 percent.

   b. For therapeutic doses, also check the patient's name, the radionuclide, the chemical form, and the activity vs. the order written by the physician who will perform the procedure.

7. Wear personnel monitoring devices (film badge or TLD) at all times while in areas where radioactive materials are used or stored. These devices should be worn at chest or waist level. Personnel monitoring devices when not being worn to monitor occupational exposures should be stored in a designated low background area.

8. Wear TLD finger badges during elution of generator and preparation, assay, and injection of radiopharmaceuticals.

9. Dispose of radioactive waste only in specially designated and properly shielded receptacles.

10. Never pipette by mouth.

11. Survey generator, kit preparation, and injection areas for contamination after each procedure or at the end of the day. Decontaminate if necessary.

12. Confine radioactive solutions in covered containers plainly identified and labeled with name of compound, radionuclide, date, activity, and radiation level, if applicable.

13. Always transport radioactive material in shielded containers.

EMERGENCY PROCEDURES

Appendix H

Minor Spills

1. NOTIFY: Notify persons in the area that a spill has occurred.

2. PREVENT THE SPREAD: Cover the spsill 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 material such as disposable gloves.

4. SURVEY: With a low-range, thin-window G-M survey meter, check the area aroung the spill, hands, and clothing for contamination.

5. REPORT: Report incident to the Radiation Safety Officer.

Major Spills

1. CLEAN 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 waterr.

RADIATION SAFETY OFFICER: Maurice A. Tajiran, M.S.
OFFICE PHONE: 336-0515
HOME PHONE: 361-9321

ALTERNATE NAMES AND PHONE NUMBERS
DESIGNATED BY RSO: T. A. Schultz, M.D.
OFFICE PHONE: 331-3349
HOME PHONE: 338-0380

APPENDIX I

AREA SURVEY PROCEDURES

1. All elution, preparation, and injection areas will be surveyed daily with an appropriately low-range survey meter and decontaminated if necessary.*

2. Laboratory areas where only small quantities of radioactive material are used (less than 200 μCi) will be surveyed monthly.

3. Waste storage areas and all other laboratory areas will be surveyed weekly.

4. The weekly and monthly surveys will consist of:

   a. A measurement of radiation levels with a survey meter sufficiently sensitive to detect 0.1 mR/hr.

   b. A series of wipe tests to measure contamination levels. The method for performing wipe tests will be sufficiently sensitive to detect 200 dpm per 100 cm^2 for the contaminant involved. Wipes of elution and preparation areas or other "high background" areas will be removed to a low background area for measurement.

5. A permanent record will be kept of all survey results, including negative results. The record will include:

   a. Location, date, and identification of equipment used, including the serial number and pertinent counting efficiencies.

   b. Name of person conducting the survey.

   c. Drawing of area surveyed, identifying relevant features such as active storage areas, active waste areas, etc.

   d. Measured exposure rates, keyed to location on the drawing (point out rates that require corrective action).

   e. Detected contamination levels, keyed to locations on drawing.

   f. 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.

6. Area will be cleaned if the contamination level exceeds 200 dpm/100 cm^2.

* For daily surveys where no abnormal exposures are found, only the date, the identification of the person performing the survey, and the survey results will be recorded.

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)

X 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)

X 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.**

____ 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 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. _____

*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.

APPENDIX O

MODEL PROGRAM FOR MAINTAINING OCCUPATIONAL RADIATION EXPOSURES AT MEDICAL INSTITUTIONS ALARA

_____

(Licensee's Name)

_____

(Date)

1. **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 is 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)[1] 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 judgment, 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.

2. **Radiation Safety Committee (RSC)[2]**

   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 ensure 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/her 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.

[1] Private practice physician licenses do not include an RSC.

[2] The RSO on private practice physician licenses will assume the responsibilities of the RSC under Section 2.

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.

(2) The RSC will perform a quarterly review of occupational radiation exposure with particular attention to instances where Investigational Levels in Table 0-1 below are exceeded. The principal 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 Section 6).[3]

(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.

3. 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 Section 6 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 ALARA Program

(1) The RSO will schedule briefings and educational sessions to inform workers of ALARA program efforts.

(2) The RSO will ensure 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.

c. Cooperative Efforts for Development of ALARA Procedures

Radiation workers will be given opportunities to participate in formulation of the procedures that they will be required to follow.

(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 will 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, will determine the causes. When the cause is known, the RSO will require changes in the program to maintain exposures ALARA.

4. 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 Authorized User to Persons Under His/Her Supervision

(1) The authorized user will explain the ALARA concept and his/her commitment to maintain exposures ALARA to all persons under his/her supervision.

(2) The authorized user will ensure that persons under his/her supervision who are

[3] 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 investigations.

subject to occupational radiation exposure are trained and educated in good health physics practices and in maintaining exposures ALARA.

5. **Persons Who Receive Occupational Radiation Exposure**

   a. The worker will be instructed in the ALARA concept and its relationship to working procedures and work conditions.

   b. The worker will know what recourses are available if he/she feels that ALARA is not being promoted on the job.

6. **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 RSC and/or the RSO. The Investigational Levels that we have adopted are listed in Table O-1 below. These levels apply to the exposure of individual workers.

Table O-1

	Investigational Levels (mrems per calendar quarter)	
	Level I	*Level II*
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 required by § 20.401 of 10 CFR Part 20. The following actions will be taken at the Investigational Levels as stated in Table O-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 O-1 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 and will report the results of the 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, will take action. A report of the investigation, actions taken, if any, and a copy of the individual's Form NRC-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 RSC 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. Reestablishment of an individual occupational worker's Investigational Level II to a level above that listed in Table O-1.

   In cases where a worker's or a group of workers' 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 RSC will review the justification for, and will approve, all revisions of Investigational Level II. In such cases, when the exposure equals or exceeds

the newly established Investigational Level II, those actions listed in paragraph 6.c above will be followed.

7. **Signature of Certifying Official**[4]

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

Ed Arshem

Signature

Ed Arshem

Name (print or type)

Administrator

Title

Institution (or Private Practice) Name and Address:

Central Plains Clinic
2727 S Kiwanis
Sioux Falls, SD 57105

[4]The person who is authorized to make commitments for the administration of the institution (e.g., hospital administrator) or, in the case of a private practice, the licensed physician.

January 1, 1987

McKennan Hospital
800 E. 21st
Sioux Falls, SD 57105

TO WHOM IT MAY CONCERN:

McKennan Hospital agrees to admit patients containing radioactive material prescribed and administered by authorized physicians of Central Plains Clinic.

Authorized by _____
Executive Director

25. a. For Private Practice Applicants Only

January 1, 1987

Sioux Valley Hospital
1100 S. Euclid Avenue
Sioux Falls, SD 57105

TO WHOM IT MAY CONCERN:

Sioux Valley Hospital agrees to admit patients containing radioactive material prescribed and administered by authorized physicians of Central Plains Clinic.

Authorized by _____
Executive Director

25. b. For Private Practice Applicants Only