U. S. NUCLEAR REGULATORY COMMISSION
MATERIALS LICENSE

Amendment No. 33

...ant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and ... Code of Federal Regulations, Chapter 1, Parts 30, 31, 32, 33, 34, 35, 36, 40 and 70, and in reliance on statements and ...tations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and ...fer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the ...ce(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations ...f the applicable Part(s); and to import such byproduct and source material. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	In accordance with application dated September 10, 1979,
1. Deaconess Hospital	3. License number 48-00988-04 is amended in its entirety to read as follows:
2. 620 North 19th Street Milwaukee, Wisconsin 53233	4. Expiration date November 30, 1984
	5. Docket or Reference No.

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Any byproduct material listed in Groups I and II of Schedule A, Section 35.100 of 10 CFR 35	A. Any radiopharmaceutical listed in Groups I and II of Schedule A, Section 35.100 of 10 CFR 35	A. As necessary for uses authorized in Subitem 9.A.
B. Any byproduct material listed in Group III of Schedule A, Section 35.100 of 10 CFR 35	B. Any form listed in Group III of Schedule A, Section 35.100 of 10 CFR 35	B. 4 curies of each byproduct material authorized in Subitem 6.B.
C. Any byproduct material listed in Group IV of Schedule A, Section 35.100 of 10 CFR 35	C. Any radiopharmaceutical listed in Group IV of Schedule A, Section 35.100 of 10 CFR 35	C. As necessary for uses authorized in Subitem 9.C.
D. Any byproduct material listed in Group V of Schedule A, Section 35.100 of 10 CFR 35	D. Any radiopharmaceutical listed in Group V of Schedule A, Section 35.100 of 10 CFR 35	D. As necessary for uses authorized in Subitem 9.D.
E. Any byproduct material listed in Group VI of Schedule A, Section 35.100 of 10 CFR 35	E. Any sealed source listed in Group VI of Schedule A, Section 35.100 of 10 CFR 35	E. 1 curie total for all sources authorized in Subitem 6.E.

Supplementary Sheet

From Page 1

License Number 48-00988-04

Docket or Reference No.

Amendment No. 33

Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
F. Xenon-133	F. Free gas or solution	F. 100 millicuries
G. Any byproduct material listed in Section 31.11(a) of 10 CFR 31	G. Prepackaged Kits	G. 3 millicuries of each byproduct material authorized in Subitem 6.G.
H. Uranium (Depleted in Uranium-235)	H. Cadmium Plated Metal	H. 160 kilograms

9. Authorized use

A. Any diagnostic procedure listed in Groups I and II of Schedule A, Section 35.100 of Title 10, Code of Federal Regulations.

B. Preparation and use of radiopharmaceuticals for any diagnostic procedure listed in Group III of Schedule A, Section 35.100 of Title 10, Code of Federal Regulations.

C. Any therapeutic procedure listed in Group IV of Schedule A, Section 35.100 of Title 10, Code of Federal Regulations.

D. Any therapeutic procedure listed in Group V of Schedule A, Section 35.100 of Title 10, Code of Federal Regulations.

E. Any procedure listed in Group VI of Schedule A, Section 35.100 of Title 10, Code of Federal Regulations.

F. Blood flow studies. Pulmonary function studies.

G. In vitro studies.

H. For use as shielding in a medical linear accelerator.

ued from page 2

CONDITIONS

10. Licensed material shall be used only at the licensee's address stated in Item 2 above.

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."

12. Licensed material listed in Item 6 above is authorized for use by, or under the supervision of, the following individual(s) for the materials and uses indicated:

Anthony G. Walker, M.D.	All
J. R. Kasner, M.D.	Diagnosis, Iodine-131 or therapy and Soluble Phosphorus-32 for therapy
S. Malinakshi Rangala, M.D.	Group VI

13. Radioactive gases as free gas or in solution, to be administered to humans, shall be procured from a supplier who distributes the product indicated for human use in accordance with the Federal Food, Drug, and Cosmetic Act.

14. Patients containing Cobalt 60, Cesium 137, or Iridium 192 implants shall remain hospitalized until surveys made with an appropriate radiation detection instrument indicate that all implants have been removed. The results of these surveys shall be recorded and maintained for inspection by the Commission for five (5) years from the time the implants are removed.

15. Notwithstanding the requirements of Section 35.14(b) of Title 10, Code of Federal Regulations, Part 35, the licensee may possess and use any licensed material for which he was authorized and that was in his possession on January 13, 1975.

16. For a period not to exceed sixty (60) days in any calendar year, a visiting physician is authorized to use licensed material for human use under the terms of this license, provided the visiting physician:

(a) Has the prior written permission of the hospital's Administrator and its Medical Isotopes Committee, and

(b) Is specifically named as a user on a Nuclear Regulatory Commission license authorizing human use, and

(c) Performs only those procedures for which he is specifically authorized by a Nuclear Regulatory Commission license.

ntinued from page 3

Conditions

16. The licensee shall maintain for inspection by the Commission copies of the written permission specified in subitem (a) above and of the license(s) specified in subitems (b) and (c) above. These records shall be maintained for five (5) years from the time the licensee grants its permission under subitem (a) above.

17. A. Technetium-99m separated from molybdenum-99 either by elution of a molybdenum-99/technetium-99m generator or by an extraction process shall be tested to detect and quantify molybdenum-99 activity prior to administration to patients.

B. The licensee shall not administer to patients technetium-99m containing more than one (1) microcurie of molybdenum-99 per millicurie of technetium-99m or more than five (5) microcuries of molybdenum-99 per dose of technetium-99m at the time of administration. The limits for molybdenum-99 contamination represent maximum values and molybdenum-99 contamination should be kept as low as reasonably achievable below these limits.

C. The licensee shall establish written procedures for personnel performing tests to detect and quantify molybdenum-99 contamination. These procedures shall include all necessary calculations and steps to be taken if activities of molybdenum-99 in excess of the limits specified in Subitem B. above are detected.

D. Personnel performing tests to detect and quantify molybdenum-99 contamination shall be given specific training in performing these tests prior to conducting such tests.

E. (1) The licensee shall maintain for inspection by the Nuclear Regulatory Commission records of the results of each test performed to detect and quantify molybdenum-99 contamination and records of training given to personnel performing these tests.

(2) Records described in Subitem E.(1) above shall be maintained for two (2) years following the performance of the tests and the training of personnel.

18. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6., 7., and 8. of this license in accordance with statements, representations, and procedures contained in application dated September 10, 1979; and letters dated October 9, 1979 and October 10, 1979. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

Date NOV 20 1979

For the U. S. Nuclear Regulatory Commission

by Material Licensing Branch
Division of Fuel Cycle and
Material Safety
Washington, DC 20555

CONTROL NO. 7814

Ref: NRC 313M - Item 7

MEDICAL ISOTOPE COMMITTEE

When any modifications of facilities or operations become necessary as the Nuclear Medicine program develops, we will notify the Nuclear Regulatory Commission accordingly.

We confirm our enforcement of ALARA philosophy.

We would like to expand the responsibilities of the GSMC Medical Isotope Committee to include that of this clinic. The committee would review the operation of this facility and record their report at each committee meeting. The committee's make up and responsibilities are stated for license #48-00988-04 (copy enclosed).

The guidelines and method of operation willl be followed as outlined in appendix B, U.S. NRC regulatory guide 10.8 dated October 1980.

Ref: NRC 313M Item 8

TRAINING AND EXPERIENCE

Authorized User(s) and Radiation Safety Officer

Training & Experience of Individual Nuclear Physicians

Please refer to the following NRC license number(s) for the nucler physician users:

NRC 48-00988-04

Radiation Safety Officer: Training, Duties & Availability:

We would like to designate B. David Collier,Jr., M.D. as radiation safety officer.

a). Training:

The training and experience descriptions of the Radiation Safety officer (R.S.O.) are referenced above.

b). Duties:

The R.S.O. is responsible for the overall radiation protection program within the institution. The R.S.O. has authority to implement and enforce all NRC license stipulations and regulations pertaining to the institution on a daily basis and has authority to immediately terminate any hazardous operation. The R.S.O., responsibilities involve not only routine applications and occupationsl personnel within the restricted areas using radioactive materials in the institution but also all non-occupational personnel and visitors in non-restricted areas, as well as security and handling procedures from the time radioactive shipments arrive in the hospital, day or night, throught the time all such sources are properly used or disposed. The R.S.O. must document extensive education (initially, as needed and at least annually) of all personnel and public who may come within the vicinity of radioactive materials.

c). Availability:

Other trained users will provide back-up 24 hour per day coverage during illness and vacations. Phone numbers for listed users and Regional NRC division of compliance will be supplied to administration.

Ref: NRC 313M - Item 9

INSTRUMENTATION

a). Low level survey meter

One (1) Victoreen model 490 survey meter.
Beta-gamma detection.
Range 0.01mR/hr to 200 mR/hr

This survey meter will be sufficient to monitor all anticipated activity on site. If an occasion would require a meter able to read to 1 R/hr could transfer the survey meter listed below from Good Samaritan Medical Center.

Transfer option

High level survey meter

One (1) Victoreen Model 592B high level survey meter.

Beta -gamma detection.
Range omR/hr to 1 R/hr

b). Dose Calibrator

One (1) Nuclear Chicago Mediac Radioisotope Dose Calibrator.

c). Diagnostic Instruments

One (1) General Electric Maxi II gamma camera
One (1) Technicare Vip 450/460 computer system
One (1) Nuclear Chicago Model 8725 scintillation counter and well.

Ref: NRC 313M - Item 10

CALIBRATION OF INSTRUMENTS

a). Survey Meters:

The survey meters will be calibrated at least annually, and after repairs, by return to the manufacturer for such calibration of at least two points on each scale. In the event any manufacturer should discontinue calibration services, or provides inadequate service, our back-up calibration service firm will be Stan A. Huber Consultants, Inc., of New Lenox, Illinois, whose radiation sources and procedures are on file with the NRC under license #12-17503-01.

b). Dose Calibrator:

We shall follow the calibration procedures for dose calibrators as defined in the USNRC Regulatory Guide 10.8 October 1980 appendix D section 2 with the following exceptions:

All accuracys are to be withing 10% due to ±5% error on sample or standard calibration and ±5% machine error.

Part A - Guide 10.8

Item 1 changed to read on-day of use instead of daily.

Part C - Guide 10.8

Item 3 deleted
Item 4 deleted

We will also use Ra 226 and CS -137 for our day of use dose calibrator checks. Records of all tests, checks calibrations, and repairs will be maintained.

CONTROL NO. 78147

Ref: NRC 313M - Item 11

FACILITIES AND EQUIPMENT

a). Enclosed are the floor plans for the Family Health Plan's upper and lower levels. The proposed Nuclear Medicine areas are indicated on the lower level marked Soc Wk L-17D and Social Work L-17E. Enclosed is our best estimate of where all equipment will be located on an expanded view of Nuclear Medicine.

Please see attached floor plans marked NRC 313M Item 11.

b). Equipment

All radioactivity will be kept in lead shielding and stored behind lead bricks (each 2" thick x 4" wide x 8" long).

c). Dose Preparation Area

The dose preparation area on the hot lab area work bench as shown on the facility sketch, is shielded in the front by an upright Protective Lead Barrier (15" x 15"x 1/2 thick). Disposable gloves, remote handling tongs (4" to 8" long), survey meters, plastic backed absorbent pads.

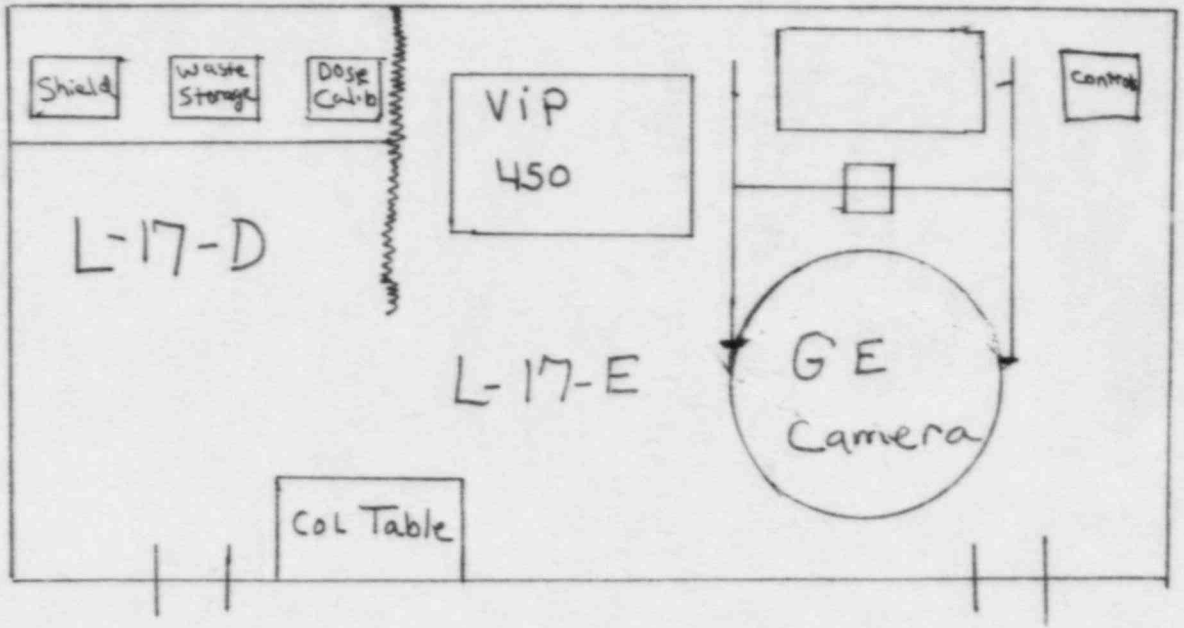
d). Waste Area Shielding:

All contaminated materials (needles, syringes, gloves) will be stored in a contaminated needle box that is properly marked and stored in a commercially supplied lead generator shield.

All areas will be secured and properly posted in accordance with 10CFR part 20.

Ref: NRC 313M - Item 11

Expanded Floor Plan



FAMILY HEALTH PLAN

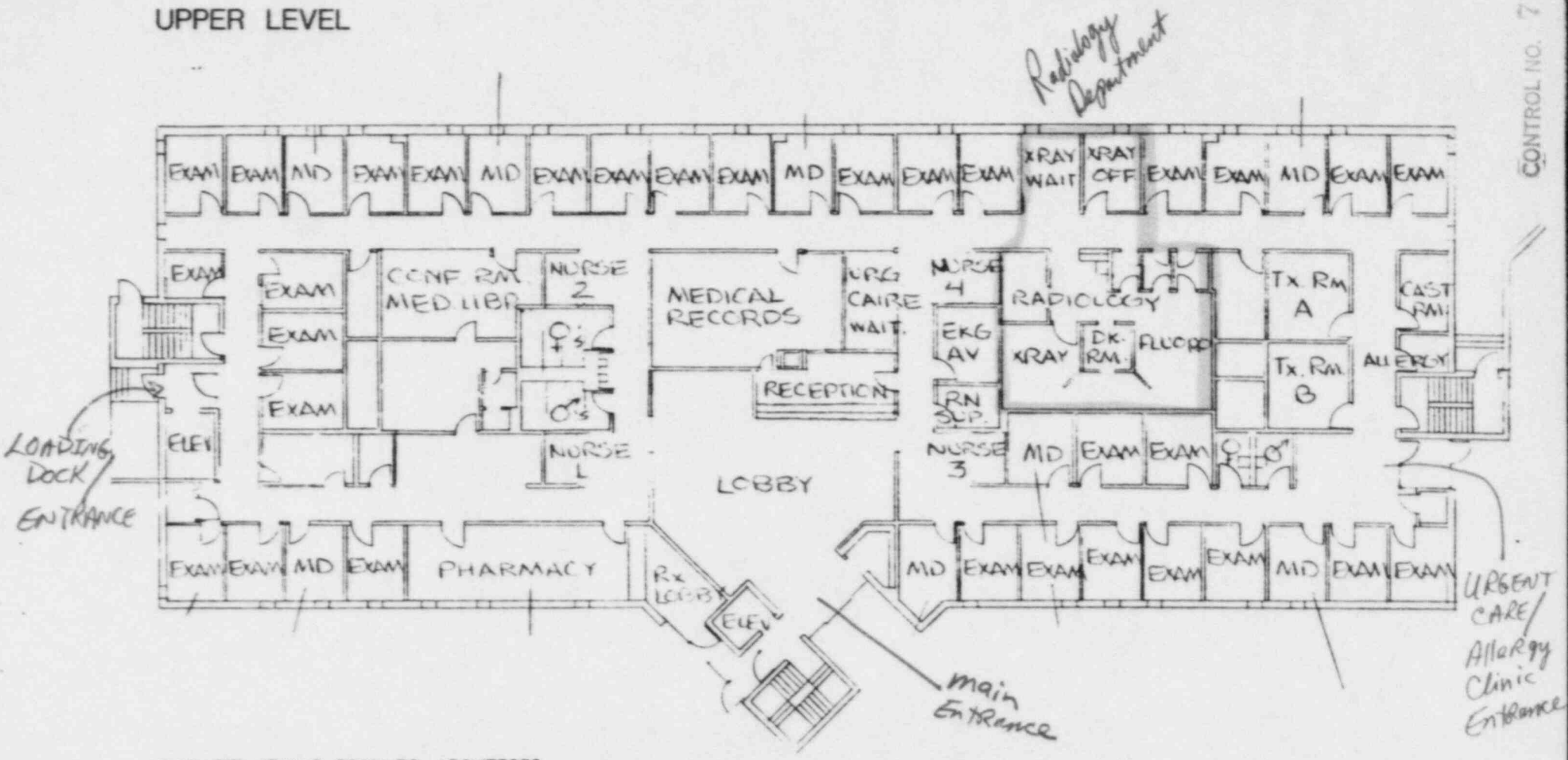
LOWER LEVEL

CONTROL NO. 78147

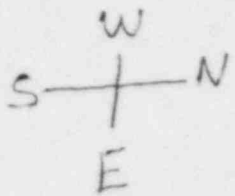
PLUNKETT KEYMAR REGINATO, ARCHITECTS

FAMILY HEALTH PLAN

UPPER LEVEL



PLUNKETT KEYMAR RECINATO ARCHITECTS



Ref: NRC 313M -Item 12

PERSONNEL TRAINING PROGRAM AND FREQUENCY

Only certified nuclear medicine technologists or registered technicians (radiologic or medical) or registered nurses, with nuclear medicine training and/or experience, will be accepted as nuclear medicine staff. Additionally, the Radiation Safety Officer will determine that each such individual has had, or will receive within the first year of operations, the following categories and amounts of training as a minimum:

1: Radiation physics and instrumentation (50 hours)

2. Radiation protection (15 hours)

3. Mathematics pertaining to the use and measurement of radioactivity (10 hours)

4. Radiation biology (10 hours)

5. Radiopharmaceutical chemistry (15 hours)

Others:

The Radiation Safety Officer will verify instruction of ancillary staff who could have any contact with nuclear medicine or radioative shipments, during the initial week of operations and at least annually, about the following items:

1. The necessary safety precautions defined in 10CFR Parts 19 and 20.

2. The Radioactive Shipment Receipt and Notification procedures.

3. The institutions Radiation Safety Program.

4. A basic description of the institutions NRC license, conditions, physician users, Medical Isotope Committee, and ALARA philosophy.

5. Inform everyone of the responsibilities and availability of the Radiation Safety Officer and his qualified delegates at all times, in addition to consultation available from the NRC Regional Division of Compliance.

6. The nuclear technologists are also to attend this annual refresher program to be knowledgeable about the stipulation of the institutions NRC license.

Ref: NRC 313M -Item 13

Radiation Safety Program

(PROCEDURES FOR ORDERING OF RADIOACTIVE MATERIAL)

A. a). Radioactive materials are ordered by the nuclear technologists, uncer diretion of the licensed physician users, on an as needed basis to maintained inventory at minimal levels.

b). Shipments received during off-duty hours are received by the Security Supervisors, who directs the transport to Nuclear Medicine where the shipment is placed behind the lead shield on the Hot Lab work bench and the area is re-locked.

c). The supervisors of all personnel sections (such as telephone operators, security, emergency room staff and housekeeping) are to be instructed, initially and at least annually, by the Radiation Safety Officer that the Security Supervisor and his supervisory staff are the responsible persons to be notified upon receipt of radioactive materials during off-duty hours and the nuclear technicians are to be notified of shipment receipt during on-duty hours (main day shift).

d). The Radiation Safety Officer will provide and explain written instructions to all personnel in the vicinity of Nuclear Medicine and who could have any contact with radioactive material shipments. See attached "Radioactive Shipment Receipt and Notification Procedures", "Memos to Nursing, Telephone Operators; Security and Housekpeeing ",and "Personnel Training Program and Frequency" descriptions.This will ensure that all personnel are knowledgeable in radiation safety procedures and techniques pertinent to their respective duties in accordance with Section 19.12 of 10CFR19.

Ref: NRC 313M Item 14

1. Appendix F Procedure followed as stated in U.S. NRC regulatory guide 10.8 dated October 1980.

Ref: NRC 313M Item 15

1. Appendix G Procedures followed as stated in U.S. NRC regulatory guide 10.8 dated October 1980.

Ref: NRC 313M Item 16

1. Appendix H Procedures followed as stated in U.S. NRC regulatory guide 10.9 dated October 1980.

Radiation Safety Officer

B. David Collier, Jr., M.D.
Home Phone # 258-6381
Office Phone # 259-5971

Alternates

Purushotham Veluvolu,M.D.
Home Phone # 476-7660

John P. Whalen, M.D.
Home Phone # 475-1813

Ref: NRC 313M Item 17

1. Appendix I procedures followed as outlined in U.S. NRC Regulatory guide 10.8 dated October , 1980.

Ref: NRC 313M Item 18

See Attached copy of Appendix J

Ref: NRC 313M Item 19

Therapeutic doses of radiopharmecuticals will be under direct supervision of the licensed physician users. No therapy doses will be given that require hospitalization. All isotopes will be ordered by written prescription and an informed consent will be obtained by a physician user.

Ref: NRC 313M Items 20 - 23

NOT APPLICABLE

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.**

_____ 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).

X Other (specify): Return to supplier in original container

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.

MEMORANDUM

TO: Head Nurse- Day & Evening Shifts

FROM: Radiation Safety Officer - Nuclear Medicine

RE: RECEIPT OF PACKAGES COONTAINING RADIOACTIVE MATERIAL

REF: NRC 313M - Item 13 and Section A of Radiation Safety Program

---

This MEMO is to advise you of supervisory responsibilities, communications and training needed to ensure proper handling of incoming radioisotope shipments to our institution as required by the Federal Nuclear Regulatory Commission.

Attached is a copy of our"Radioactive Shipment Receipt and Notification Procedures" for your preliminary reference. Please see me to establish times when we can conduct this training course, which will need to be implemented the week of initial Nuclear Medicine operations, and at least annually thereafter.

We will also need to discuss the need for having disposable gloves at all locations where radioisotope shipments could enter the clinic for personnel to wear when handling the shipments in immediate transport to Nuclear Medicine. Night shift procedures, shipment placements and security also need to be discussed.

Thank you for your cooperation.

RADIATION SAFETY OFFICER: B. DAVID COLLIER JR, M.D.

ON DUTY PHONE: 344-8800

HOME PHONE: 258-6381

MEMORANDUM

TO: Chief of Security - Day & Evening Shifts

FROM: Radiation Safety Officer - Nuclear Medicine

RE: RECEIPT OF PACKAGES COONTAINING RADIOACTIVE MATERIAL

REF: NRC 313M - Item 13 and Section A of Radiation Safety Program

---

This MEMO is to advise you of supervisory responsibilities, communications and training needed to ensure proper handling of incoming radioisotope shipments to our institution as required by the Federal Nuclear Regulatory Commission.

Attached is a copy of our"Radioactive Shipment Receipt and Notification Procedures" for your preliminary reference. Please see me to establish times when we can conduct this training course, which will need to be implemented the week of initial Nuclear Medicine operations, and at least annually thereafter.

Thank you for your cooperation.

RADIATION SAFETY OFFICER: B. DAVID COLLIER JR, M.D.

ON DUTY PHONE: 344-8800

HOME PHONE: 258-6381

CONTROL NO. 78147

MEMORANDUM

TO: Telephone Operations Supervisor Day & Evening Shifts

FROM: Radiation Safety Officer - Nuclear Medicine

RE: RECEIPT OF PACKAGES COONTAINING RADIOACTIVE MATERIAL

REF: NRC 313M - Item 13 and Section A of Radiation Safety Program

---

This MEMO is to advise you of supervisory responsibilities, communications and training needed to ensure proper handling of incoming radioisotope shipments to our institution as required by the Federal Nuclear Regulatory Commission.

Attached is a copy of our"Radioactive Shipment Receipt and Notification Procedures" for your preliminary reference. Please see me to establish times when we can conduct this training course, which will need to be implemented the week of initial Nuclear Medicine operations, and at least annually thereafter.

Thank you for your cooperation.

RADIATION SAFETY OFFICER: B. DAVID COLLIER JR, M.D.

ON DUTY PHONE: 344-8800

HOME PHONE: 258-6381

MEMORANDUM

TO: Housekeeping Supervisor - Day & Evening Shifts

FROM: Radiation Safety Officer - Nuclear Medicine

RE: RECEIPT OF PACKAGES COONTAINING RADIOACTIVE MATERIAL

REF: NRC 313M - Item 13 and Section A of Radiation Safety Program

---

This MEMO is to advise you of supervisory responsibilities, communications and training needed to ensure proper handling of incoming radioisotope shipments to our institution as required by the Federal Nuclear Regulatory Commission.

Attached is a copy of our"Radioactive Shipment Receipt and Notification Procedures" for your preliminary reference. Please see me to establish times when we can conduct this training course, which will need to be implemented the week of initial Nuclear Medicine operations, and at least annually thereafter.

In addition to the training program, we will need to discuss those areas in Nuclear Medicine which should be cleaned on a routine basis and those areas which should not be cleaned on a routine basis and those areas which should not be cleaned by housekeeping. Also, no containers with a "Caution - Radioactive Materials" sign shall be removed from Nuclear Medicine without approval from the Radiation Safety Officer, or Nuclear Medicine technologists.

Thank you for your cooperation.

RADIATION SAFETY OFFICER: B. DAVID COLLIER JR, M.D.

ON DUTY PHONE: 344-8800

HOME PHONE: 258-6381

CONTROL NO. 78147

GOOD
SAMARITAN
MEDICAL CENTER

Deaconess Hospital Campus

620 North 19th Street
Milwaukee, Wisconsin 53233
414/933-9600

KENNETH S. JAMRON, F.A.C.H.A.
President

January 7, 1985

RECEIVED BY LFMB
Date 1/30/85
Log Jan 21
By CG
Orig. To C114
Action Comp CG

Applicant
Check No. 502637
Amount $120
Type of Fee FC amd
Date Check Rec'd 1/30/85
Received By CG

contained w/ 78786 no refund due

USNRC Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Sirs:

We are writing to request that NRC license number 48-00988-04 be amended due to changes in personnel and physical facilities.

I: Please remove the following physicians from the list of authorized users of materials under license number 48-00988-04.

Anthony G.Walker, M.D.
Douglas R. Fabich, M.D.
John Norlund, M.D.

II. Please increase the possession limit of Xe-133 free gas or solution from the present limit of 100 mCi to 500 mCi. This is needed to cover the projected increase in the number of patient studies performed at Good Samaritan Medical Center.

III. The Good Samaritan Medical Center Diagnostic Nuclear Medicine sections of the Deaconess and Lutheran Campuses are combining into one facility located in a new section of the Medical Center at Good Samaritan Medical Center, 2000 West Kilbourn Avenue. The new physical facility is fully described and the floor plan submitted as attached sheet labeled Exhibit "A". The expected move date is early March, 1985. The mailing address of this license from that time should read:

RECEIVED
JAN 16 1985
REGION III

Good Samaritan Medical Center
Lutheran Campus
2000 W.Kilbourn Avenue
Milwaukee, WI 53233

The requirement for the continued proper handling of Xe-133 gas are described and exhaust ventilation rates calculated for the new facility on attached sheets labeled Exhibit "B".

Through close-out radiation surveys and wipe tests of the present facilities shall be performed as soon as the existing departments are vacated. The results of these surveys will be provied to the Nuclear Regulatory Commission (Region III). These areas of the Deaconess and Lutheran Campuses shall be secured and not released for re-occupancy until such time as permission is given by the Commission. A prompt reply would be sincerely appreciated because the areas need to be utilized by

7812 2

8501160212 11pp

JAN 16 1985

GOOD
SAMARITAN
MEDICAL CENTER

Deaconess Hospital Campus

620 North 19th Street
Milwaukee, Wisconsin 53233
414/933-9600

KENNETH S. JAMRON, F.A.C.H.A.
President

other departments within the Medical Center. Once occupied, the new facility and its environs shall be surveyed with an ionization chamber survey meter to assure that radiation exposures to patients, employees, and visitors are as low as reasonably achievable.

Radioactive caution signs shall be placed in accordance with 10 CFR 20.203. The exhaust ventilation rates present for Xe-133 handling areas shall be measured to verify the ventilation rates prescribed in Exhibit "B". Routine contamination and exposure rate surveys for the new area shall be established.

IV. We request that the address on cardiac pacemaker NRC license number SNM-1367 be amended due to a change in physical facilities within Good Samaritan Medical Center. The new address on this license should read:

Good Samaritan Medical Center
Lutheran Campus
2000 W. Kilbourn Avenue
Milwaukee, WI 53233

We request all other conditions of this license remain unchanged from those listed in Amendment No. 05, dated September 12, 1982.

As this request is submitted with an amendment request to license number 48-00988-04, it is understood that no additional fee is required (per conversation with Ms. Glenda Jackson, Fees Divison of the NRC, on 1/3/85).

V. Enclosed please find a check in the amount of $120.00 to cover the fee for this amendment. Please feel free to contact us at (414) 649-6457 should you have any questions regarding this amendment request.

Sincerely,

John Schwartz
Chief Operating Officer

Douglas J. Simpkin, M.S.
Radiation Physicist

CONTROL NO. 78122

Exhibit "A"
Lic. No. 48-00988-04
January 7, 1985

PHYSICIAL DESCRIPTION OF THE NEW DIAGNOSTIC NUCLEAR MEDICINE FACILITY AT THE LUTHERAN CAMPUS, GOOD SAMARITAN MEDICAL CENTER, MILWAUKEE

The new Nuclear Medicine Department is a localized facility situated in a renovated area of the fourth floor of the Lutheran Campus. Please see the attached floor plan (Figure 1, Exhibit A) for specific locations. The facility consists of:

1. Nuclear Pharmacy ("Hot Lab"; please see Figures 2 and 3)

   The Hot Lab will be used for the storage and preparation of all radiopharmaceuticals. The Hot Lab will be equipped with a laminar flow hood for the preparation of radiopharmaceuticals, a stainless steel counter top with sink, shelving and cabinets for storage, a full size refrigerator, a lead "L" block with leaded glass for drawing radiopharmaceuticals and a supply of lead bricks for shielding storage, preparation and hot waste areas. Note that this room has no fresh air supply, while the non-recirculated exhaust rate of the flow hood is 100 cfm.

2. In Vitro RIA Lab - Count area for blood volume and Schilling samples.

3. Office for Chief Technologist

4. Exam & Prep - Patient exam room and thyroid uptake room.

5. Chief Nuc. Med. - Physician Director's Office.

6. Nuclear 1 - Gamma Camera room, Picker camera and MDS Computer.

7. Nuclear 2 - Gamma Camera room, principle use is for Xenon studies. GE Maxi II camera and associated Xenon apparatus. (See Exhibit "B" for further details).

8. Nuclear 3 - Gamma Camera - Technicare Omega 500.

9. Nuclear 4 - Gamma Camera - GE 400

10. Nuclear 5 - Gamma Camera - Technicare 400 camera.

11. Nuclear 6 - Gamma Camera - Technicare portable 420/550.

12. Nuclear 7 - Gamma Camera - Technicare portable 420/550.

13. Film Viewing & Dictation

14. Film Files

15. Tech Lounge

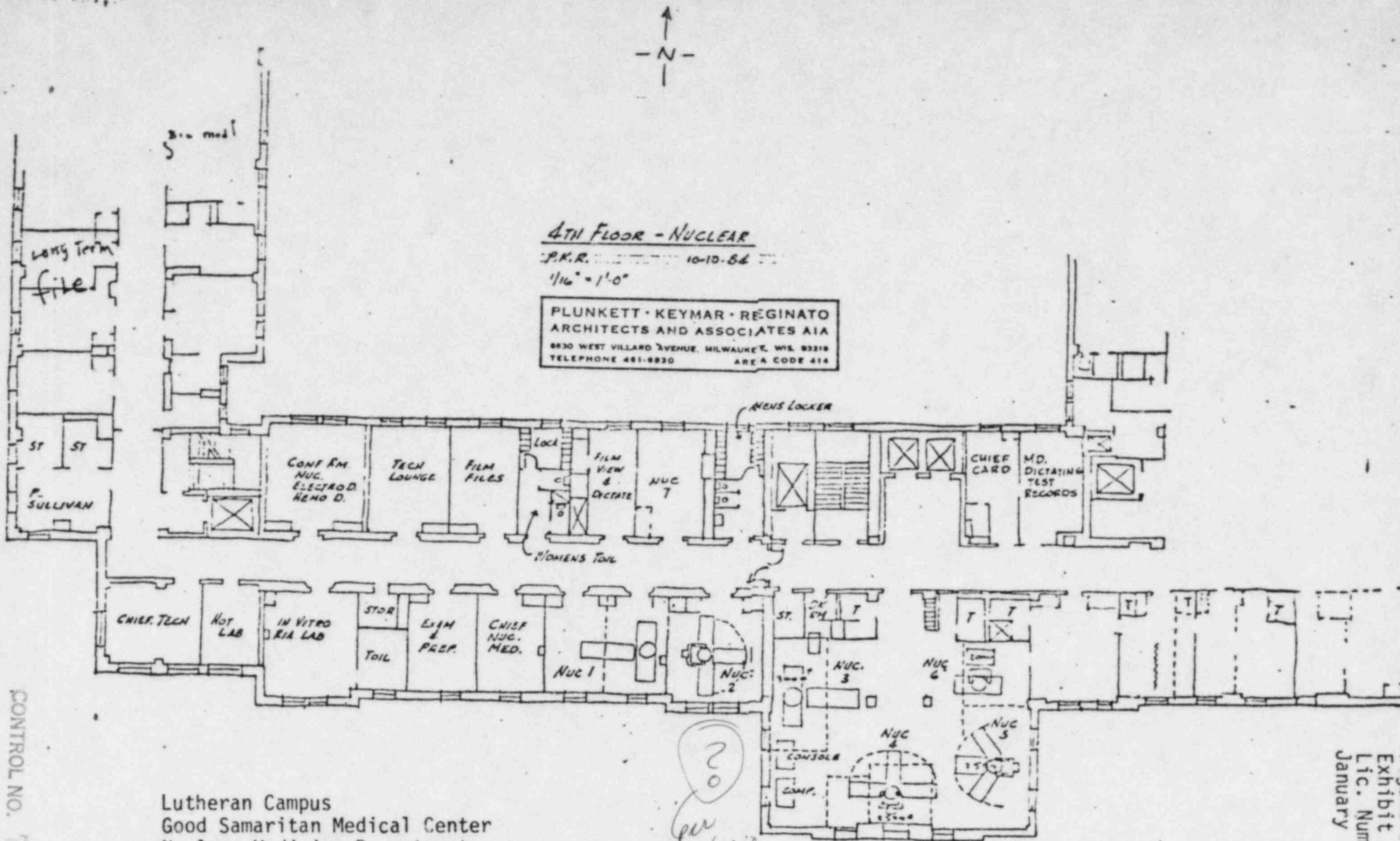
16. Conference Room

CONTROL NO. 78122

17. Long Term File - Long term file storage

Not Shown: Secured and posted room on 6th floor for long term decay-in-storage.

North and South of the department is outside, three stories above street level. To the East and West of the department are laboratories and the Cardiology Department. Above and below the department are laboratories and offices.



Lutheran Campus
Good Samaritan Medical Center
Nuclear Medicine Department

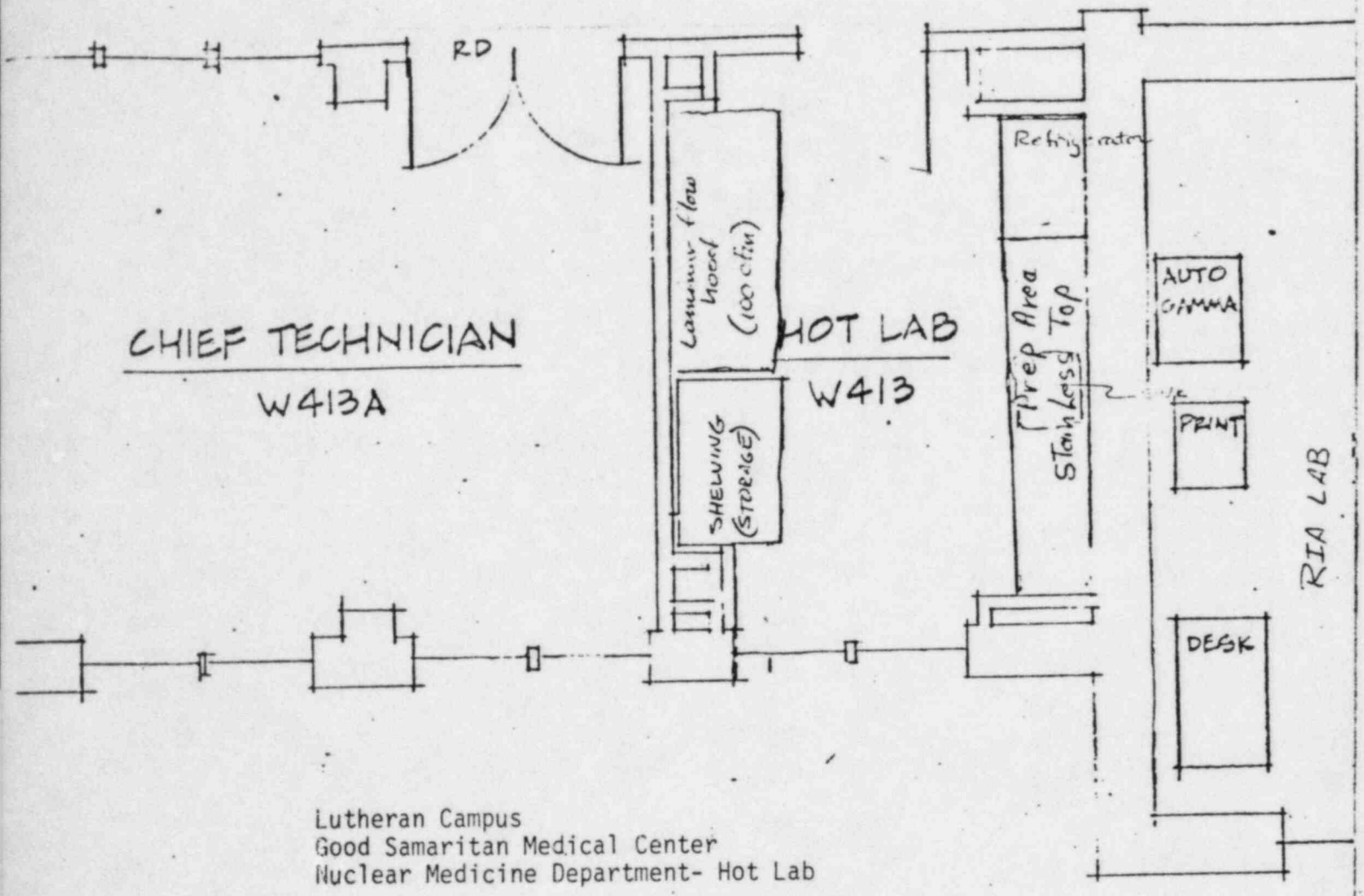
scale: 1/16" = 1'

P. Vachilon
NRC/RIII
5/16/85

Figure 1.
Exhibit A.
Lic. Num. 48-00988-04
January 7, 1985

CONTROL NO. 78122

Figure 2.
Exhibit A.
Lic. Number 48-00988-04
January 7, 1985



Lutheran Campus
Good Samaritan Medical Center
Nuclear Medicine Department- Hot Lab

scale: 1/4" = 1'

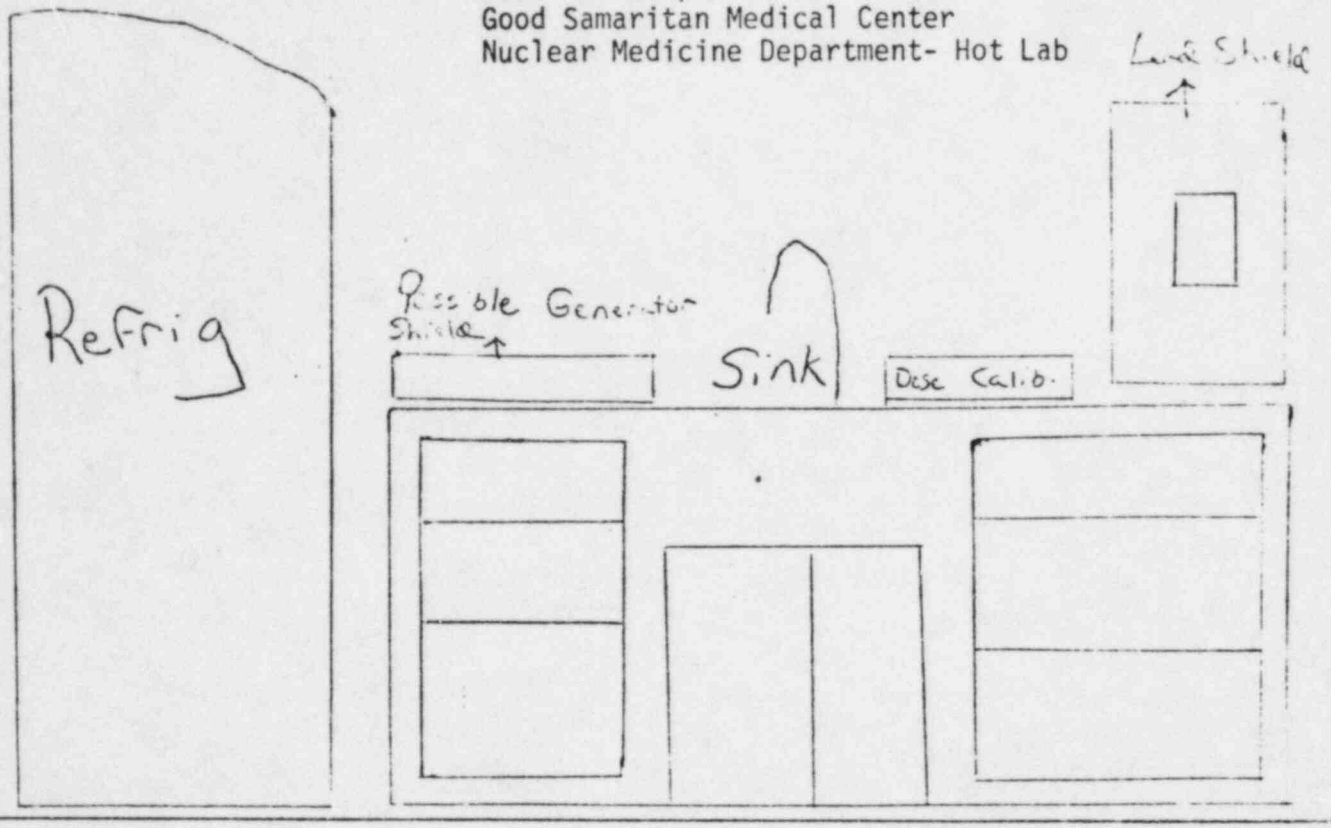
CONTROL NO. 78122

Hot LAB

East Wall

Figure 3.
Exhibit A.
Lic. Num. 48-00988-04
January 7, 1985

Lutheran Campus
Good Samaritan Medical Center
Nuclear Medicine Department- Hot Lab



West Wall

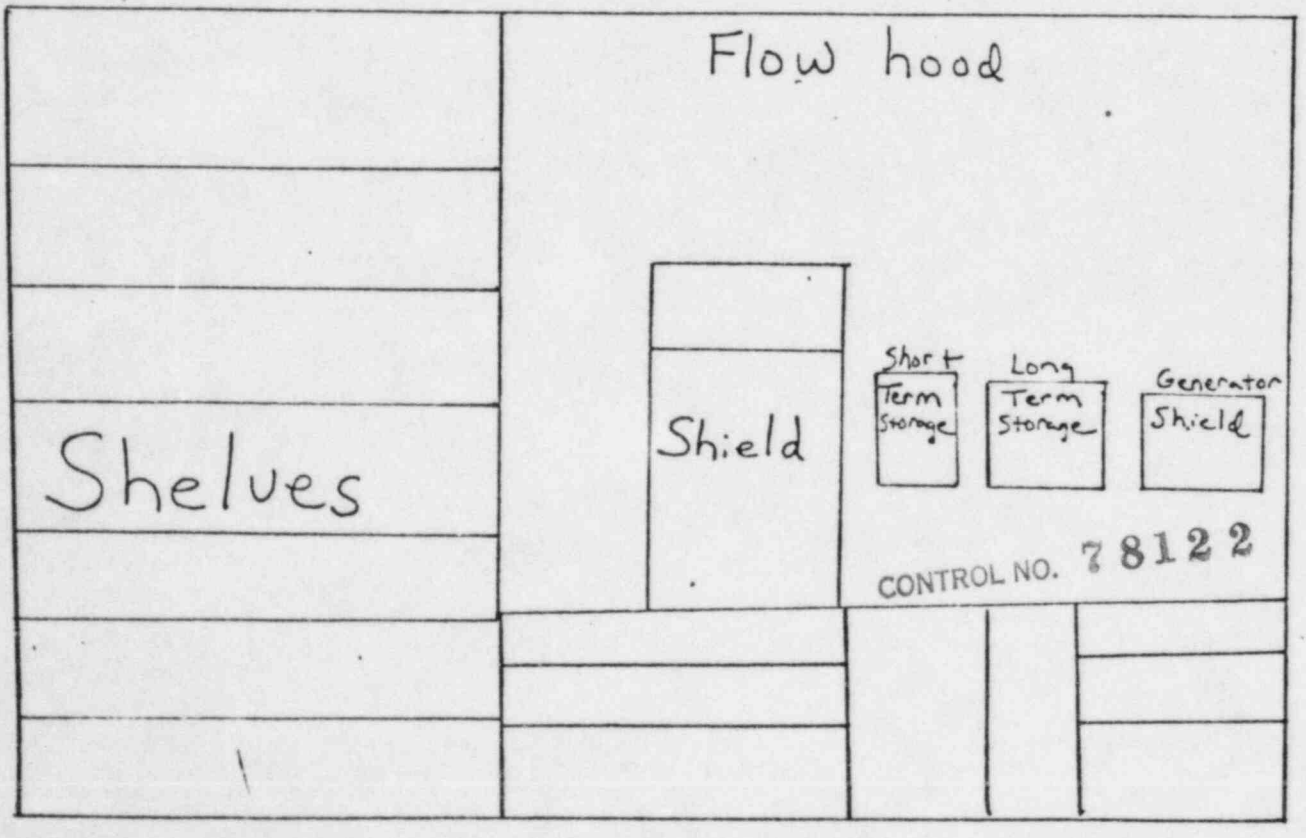


Exhibit "B"
Lic. No. 48-00988-04
January 7, 1985

CALCULATIONS FOR THE VENTILATION REQUIREMENTS FOR THE USE OF Xe-133 GAS AT GOOD SAMARITAN MEDICAL CENTER, MILWAUKEE

I. Restricted Areas

A. These calculations follow the format of Regulatory Guide 10.8, Appendix M. From past statistics, the following are reasonable and conservative assumptions on the use of Xe-133 in the scanning room (Nuclear 2).

1. Workload = 5 patients/week
2. Administered activity = 10 mCi/patient
3. Loss during administration (f) = 20%
4. Administering apparatus is an Atomlab Delivery System Model Number 130-330.

Then

$$\frac{A(\frac{uCi}{week}) \times f}{V(\frac{ml}{week})} \leq 10\% \times 10^{-5} \frac{uCi}{ml}$$

(10% of MPC for ALARA considerations).

So that

$$V \geq \frac{5 \text{ (patients/week)} \times 10 \text{ (mCi/patient)} \times 1000 \text{ (uCi/mCi)} \times 0.2}{10^{-6} (\frac{uCi}{ml}) \times 6.797 \times 10^{7} (\frac{ml}{week}/cfm)}$$

$$\geq 147 \text{ cfm}$$

The nonrecirculated exhaust ventilation rate specified by the construction contractors is 1200 cfm, while the supply rate to the room is 1000 cfm. The location of these ducts are shown on Figure 1, Exhibit "B". This should maintain negative room pressure relative to the corridor as well as a satisfactory air flow away from the room door. Once construction is completed, the supply and exhaust rates shall be verified and compliance with the minimum exhaust rate of 147 cfm and the fact of negative room pressure assured.

B. For Xe-133 storage in the laminar flow hood in the Hot Lab the nonrecirculated exhaust rate will be 100 cfm. All Xe-133 shall be stored and prepared for administration in this hood. Supply air comes through the room door only, thus assuring negative pressure in the Hot Lab relative to the corridor.

Assuming workloads as above, with a loss in storage of 10%, then the minimum exhaust rate from the hood required to maintain Xe-133 concentrations in the hood at 10% MPC is

$$V \geq \frac{5 \text{ (patients/week)} \times 10 \text{ (mCi/patient)} \times 1000 (\frac{uCi}{mCi}) \times .1}{10^{-6} (\frac{uCi}{ml}) \times 6.797 \times 10^{7} (\frac{ml}{week}/cfm)}$$

$$\geq 75 \text{ cfm}$$

Thus an exhaust rate of 100 cfm should be more than adequate for the Hot Lab hood.

II. Unrestricted Areas: Xe-133 Disposal

The Xe-133 expired by the patient is collected on an Atomlab Xenon Gas Trap (#127-313) system lead shielded charcoal trap. The trap efficiency and room contamination levels are monitored monthly by a Nuclear Associates Xenalert Model 36-751 real-time flow-through Xe-133 meter. The charcoal trap will be replaced when the trap effluent ^{133}Xe concentration is seen to exceed 100×10^{-5} μCi/ml. At this level 0.02 mCi Xe-133 per scan are being vented to the unrestricted environment, while scanning room concentrations are kept quite low by the use of a plastic hose running the trap effluent directly to the room exhaust duct.

The spent lead lined charcoal traps are sealed with tape at the air handling connections, and stored for decay and eventual reuse. Decay-in-storage will be in a secured and posted room on the 6th floor of the hospital.

A. The exhaust from the scanning room (Nuclear 2) is provided (at a rate of 1200 cfm) by a fan which shall be run during the time of the Xe-133 patient procedure (at least 5 minutes). This exhaust will enter the environment three stories above street level.

Assuming:

1. 0.5 mCi/patient is not trapped by charcoal and thus exhausted to the unrestricted environment.
2. 5 patients/week
3. 1200 cfm exhaust rate

Then the unrestricted concentration during the procedure is

$$C = \frac{A}{V} = \frac{0.5(\text{mCi}) \times 1000(\frac{\mu\text{Ci}}{\text{mCi}}) \times 5(\frac{\text{patients}}{\text{week}}) \times 52(\frac{\text{weeks}}{\text{year}})}{1200(\frac{\text{ft}^3}{\text{min}}) \times 5(\frac{\text{min.exh}}{\text{patient}}) \times 5(\frac{\text{patients}}{\text{week}}) \times 52(\frac{\text{week}}{\text{year}}) \times 2.832 \times 10^4 \frac{\text{ml}}{\text{ft}^3}}$$

$= 2.94 \times 10^{-6} \frac{\mu\text{Ci}}{\text{ml}}$ during the procedure.

Averaging over the course of a year:

$$C = 2.94 \times 10^{-6} \frac{\mu\text{Ci}}{\text{ml}} \times \frac{5(\frac{\text{min. exhaust}}{\text{patient}}) \times 5(\frac{\text{patient}}{\text{week}}) \times 52(\frac{\text{week}}{\text{year}})}{365.25(\frac{\text{day}}{\text{year}}) \times 24(\frac{\text{hour}}{\text{day}}) \times 60(\frac{\text{min}}{\text{hour}})}$$

$C = 7.27 \times 10^{-9} \frac{\mu\text{Ci}}{\text{ml}}$ averaged over a year (which is less than the MPC for unrestricted areas).

B. The Xe-133 concentration to unrestricted areas from Xe escaping into the Hot Lab laminar flow hood is estimated by

Assuming:

1. 0.5 mCi/patient escapes up the hood to the environment
2. Hood exhaust rate = 100 cfm
3. 5 patients/week

Then the unrestricted concentration is

$$C = \frac{A}{V} = \frac{0.5(\text{mCi/patient}) \times 1000(\mu\text{Ci}) \times 5(\text{patient/week}) \times 52(\text{week/year})}{100\ \text{cfm} \times 1.484 \times 10^{10}\ \text{ml/year/cfm}}$$

$$= 8.76 \times 10^{-8}\ \frac{\mu\text{Ci}}{\text{ml}}$$ which is less than the MPC for unrestricted areas

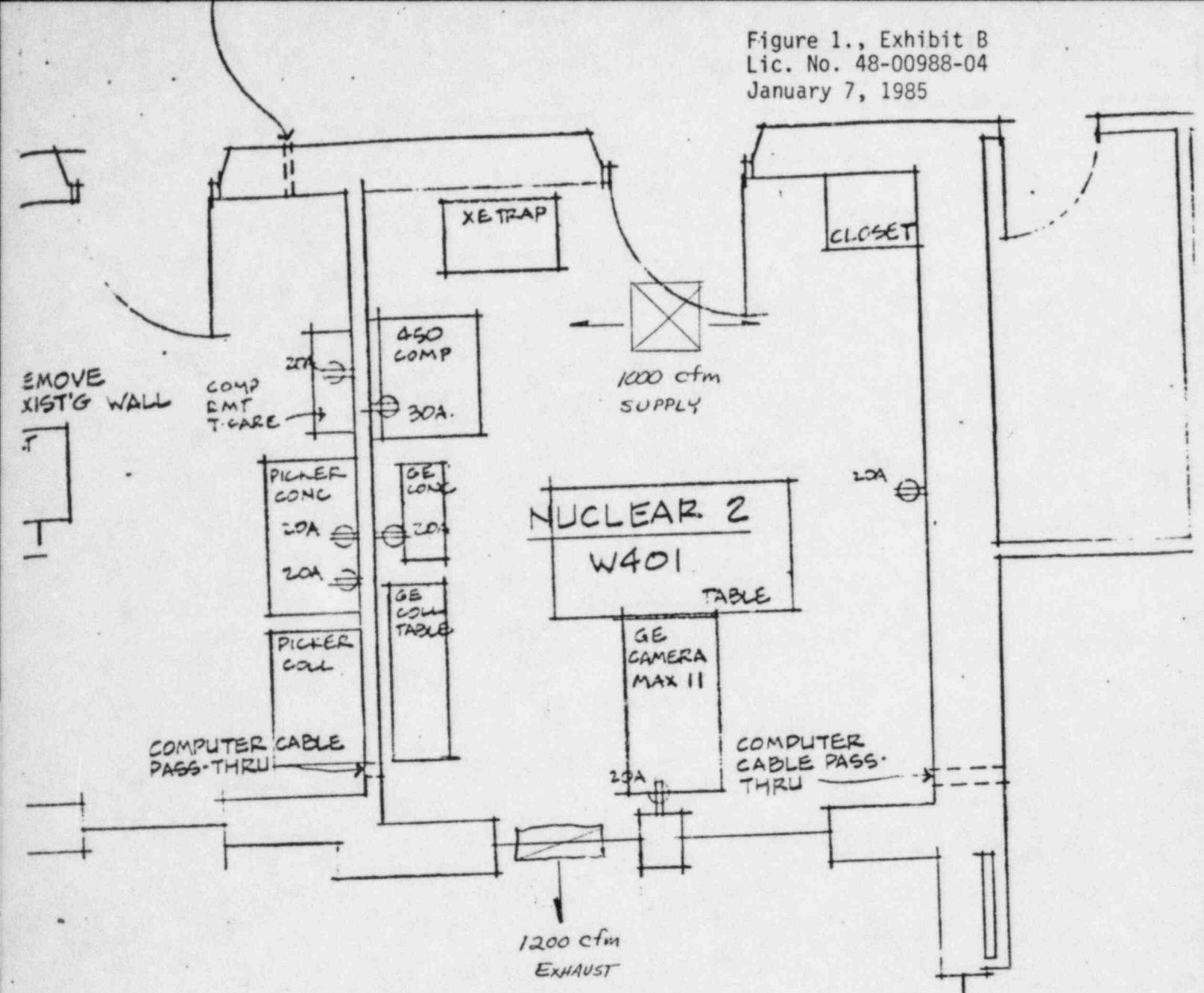
III. Emergency Procedures for Xenon-133 Gas:

A. Hot Lab: All Xenon will be kept in the laminar flow hood and in the event of its release, the Technologist will leave the room after making sure the hood exhaust fan is on and notify the supervisor and/or Radiation Safety Officer. The room shall be surveyed with a GM survey meter prior to general use. Normal operations will be resumed when survey readings are less than three times background levels.

B. Nuclear 2 (Xenon room): In the event of a release of Xenon gas, the patient will be removed from the area. The technologist will make sure the exhaust fan is on prior to leaving the area. The supervisor and/or RSO shall be notified and will determine when safe operation can resume after survey by GM survey meter. Normal operations will be resumed when survey readings are less than three times background levels.

C. Release in the corridor: All patients shall be removed from the area. Fire doors at both ends of the department shall be closed. All personnel will be notified and shall turn on exhaust fans in Nuclear 2 and the Hot Lab. The RSO and/or a supervisor will be notified and shall determine by GM survey when normal operation can resume. Normal operations will be resumed when survey readings are less than three times background levels.

Figure 1., Exhibit B
Lic. No. 48-00988-04
January 7, 1985



Nuclear 2

Xenon Room

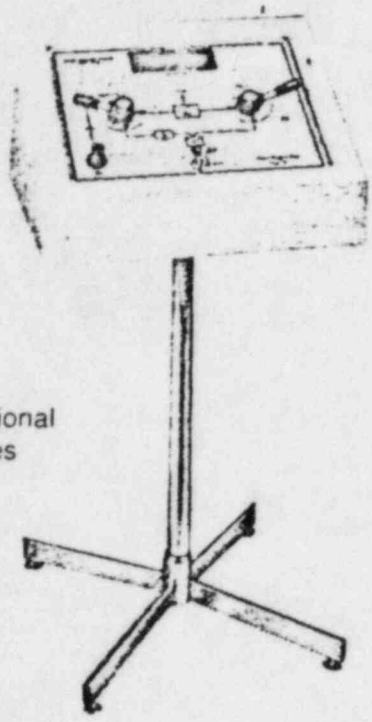
1000 cfm air inflow

1200 cfm air exhaust rate

Lutheran Campus
Good Samaritan Medical Center
Nuclear Medicine Department- Nuclear 2 (Xe-133 Administration Room)

scale: approx. 1/4" = 1'

Xenon Delivery Unit



Performs All Regional Ventilation Studies

#130-330

The Model 130-133 Xenon Delivery Unit offers an uncomplicated and inexpensive method for delivering Xenon gas for regional ventilation studies. Designed for simple, efficient and reliable operation, the unit will perform rebreathing, washout, perfusion and single breath studies with a minimum of effort. Two valves mounted on the instrument panel direct air flow for the procedure desired.

A lead glass viewing window in the panel permits observation of the breathing bag. Oxygen is thus monitored at the initiation of the study and added if required during the procedure. A push button valve starts and stops the O_2 flow. A one-way valve allows resistance free breathing in equilibrium and washout cycle. Simple-to-follow panel instructions and full lead lining insure complete safety for patient and technician.

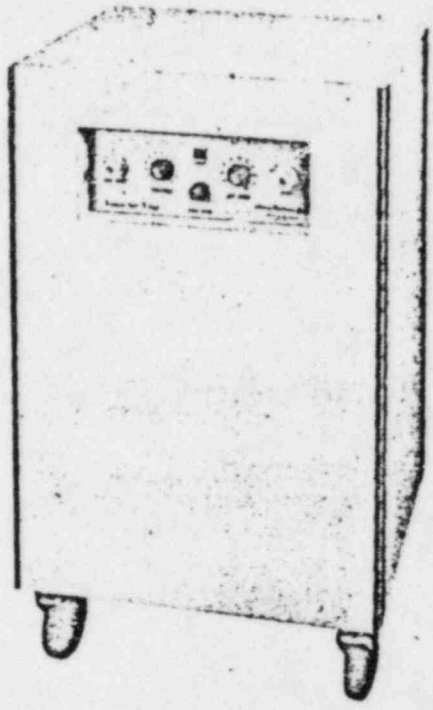
The unit will accept any commercially available Xenon source. The washout exit port can be easily vented to a trap, bag or hood. A CO_2 absorber cartridge is placed in line to prevent CO_2 build-up within the closed circuit. The cartridge is easily replaced between patient studies. A bacteria trap eliminates the need for sterilization. Each system includes complete instruction manual. Size 18" x 19" x 39".

130-330	Xenon Delivery Unit	$1250.00
130-550	Disposable Mouthpiece	1.95
130-740	Optional Stand	25.00
130-700	Disposable Bacteria Filter	3.25
139-101	Moisture Absorber (Drierite), lb.	7.50
130-019	Soda Lime, CO^2 Absorber, lb.	5.25

Xenon Gas Trap

Removes Xenon from Exhaled Air

Year Guarantee on Cartridge



#127-313

Now Xenon can be efficiently removed from exhaled air without the awkwardness and expense of venting to the outside. Such venting is regulated and may be completely prohibited by NRC or state law. The Atomlab 127-313 lead shielded Xenon Gas Trap draws air through a bed of specifically compounded activated charcoal aggregate. As expelled air migrates through the cartridge, radioactive xenon adheres to the charcoal aggregate and eventually decays. The cartridge is designed, packed and mounted to give optimal adsorption efficiency and prevent "channelling" and "walling" of the gas. The trap effluent is virtually devoid of radioactivity. The patient output is gently drawn in by an induction vacuum pump; flow speed can be adjusted and monitored to assure patient comfort. A timing device allows the operator to choose the desired washout time (1 to 15 minutes) and automatically shut down when the study is completed. A pilot light indicates when the unit is in operation.

The model 127-313 Xenon Gas Trap can be easily integrated into any ^{133}Xe system or may be used independently as a patient exhalation unit. The 1/8" lead shielding makes external radiation levels negligible. A dessicant cartridge on the input line functions as a water trap.

SPECIFICATIONS

Size: 18"x19"x34"
Mobility: Rolls on 4" casters
Weight: 125 Lbs.
Finish: White Formica
Power: 115V.
Controls: On-Off/Timer switch, Pilot Light, Air Flow Controls

127-313	Xenon Gas Trap	$1195.00
127-318	Replacement Charcoal Cartridge	335.00
087-130	220V Converter	150.00

CONTROL NO. 78122

U.S. NUCLEAR REGULATORY COMMISSION

PAGE 1 OF 1 PAGES

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number
48-00988-04

Docket or Reference number

Amendment No. 37

Good Samaritan Medical Center
Deaconess Hospital Campus
620 North 19th Street
Milwaukee, WI 53233

In accordance with letter dated November 2, 1983, License Number 48-00988-04 is amended as follows:

Item 4 (Expiration Date) is changed from November 30, 1984 to August 31, 1985.

Subitem 9.F. is amended to read:

9.F. Blood flow studies, pulmonary function studies and lung imaging.

Condition 18. is amended to read:

18. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated September 10, 1979; letters dated October 9, 1979, October 10, 1979, November 25, 1980 (with attached ALARA Program), August 5, 1982, November 22, 1982, March 25, 1983 and November 2, 1983. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

For the U.S. Nuclear Regulatory Commission

8501110245

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Original Signed
By B. J. Holt
Materials Licensing Section, Region III

Date January 3, 1984

COPY 5