KALISPELL REGIONAL HOSPITAL
KALISPELL MONTANA 59901
PH: 755-5111

August 8, 1985

U.S. Nuclear Regulatory Commission, Region IV
Materials Licensing
611 Ryan Plaza Drive, Suite 100
Arlington, TX 76011

Gentlemen:

In regards to license #25-15463-01 for Kalispell Regional Hospital, I wish to request the following amendments:

1. The addition of Xenon 133 for human use to our license. Item 6a and 21.

2. The update of new personnel and their duties on the Radiation Safety Committee. Item 7.

3. The request to change to quarterly meetings rather than monthly meetings as our license now reads. Item 7.

4. The addition of another physician on our license. The physician requested is Michael B. Wickersham. Item 8.

5. The update of new equipment purchased in the department. Item 9.

Enclosed is documentation needed for each amendment request in duplicate as well as a check for the amendment fee in the amount of $120.

Sincerely,

EUGENE G. JOHNSON
Administrator

EGJ:bgs

Enclosures

460736

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

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

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

Kalispell Regional Hospital
310 Sunnyview Lane
Kalispell, MT 59901

TELEPHONE NO.: AREA CODE (406) 755 - 5111

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

2. PERSON TO CONTACT REGARDING THIS APPLICATION

Michael B. Wickersahm, M.D.
310 Sunnyview Lane

TELEPHONE NO.: AREA CODE (406) 755-5111 ex2717

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

a. ☐ NEW LICENSE
b. ☒ AMENDMENT TO LICENSE NO. 25-15463-01
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 License number

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.)*

C. Read Vaughan, M.D.

6.a. RADIOACTIVE MATERIAL FOR MEDICAL USE

RADIOACTIVE MATERIAL LISTED IN:	ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)
10 CFR 31.11 FOR IN VITRO STUDIES		
10 CFR 35.100, SCHEDULE A, GROUP I		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP II		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP III		
10 CFR 35.100, SCHEDULE A, GROUP IV		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		
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		
XENON-133 AS GAS OR GAS IN SALINE FOR BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES.	X	100mCi

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

Aug - 4 - IV
Applicant
Check No. 7104
Amount/Fee Category 7.C. $1200
Type of Fee Amd
Date Check Rec'd 8/21/84
Received By Jac Mac

NRC FORM 313M (9-81)

460736

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

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

24. PERSONNEL MONITORING DEVICES

TYPE (Check appropriate box)			SUPPLIER	EXCHANGE FREQUENCY
a. WHOLE BODY		FILM		
		TLD		
		OTHER (Specify)		
b. FINGER		FILM		
		TLD		
		OTHER (Specify)		
c. WRIST		FILM		
		TLD		
		OTHER (Specify)		

d. OTHER (Specify)

25. FOR PRIVATE PRACTICE APPLICANTS ONLY

a. HOSPITAL AGREEING TO ACCEPT PATIENTS CONTAINING RADIOACTIVE MATERIAL

NAME OF HOSPITAL

MAILING ADDRESS

CITY | STATE | ZIP CODE

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

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

26. CERTIFICATE

(This item must be completed by applicant)

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

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

(1) LICENSE FEE CATEGORY: 7 C

(2) LICENSE FEE ENCLOSED: $ 120.00

b. APPLICANT OR CERTIFYING OFFICIAL *(Signature)*

(1) NAME *(Type or Print)*

(2) TITLE

c. DATE

NRC FORM 313M (9-81)

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313M. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).

2. **PRINCIPAL PURPOSE(S)** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30-36 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.

3. **ROUTINE USES** The information may be used: (a) to provide records to State health departments for their information and use; and (b) to provide information to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for a NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you. A copy of the license issued will routinely be placed in the NRC's Public Document Room, 1717 H Street, N.W., Washington, D.C.

4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed.

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

Amendment #1

Attachment #1
Page #1

GENERAL INFORMATION

Radioactive Material - Xenon 133
Chemical and/or physical form - gas and saline solution
Maximum Quanity - 100 Millicuries

Gas is to be used for lung imaging and evaluation of pulmonary function. Solution is to be used for cerebral blood flow, pulmonary function, and muscle blood flow studies.

1. Quantity to be used
   a. Approximately 100 ventilation lung scans will be done per year, with an average dose of 10 mCi Xe 133 per scan.
   b. The desired possession limit is 100 mCi.

2. Use and storage areas --- see attached floor plan.
   a. Ventilation lung scans will be done in the G.E. camera room in conjunction with an automatic Pulmonex Xenon Delivery System (#130-500, Atomic Products Corporation).
   b. The shielded capsules of Xe 133 will be stored in the isotope preparation room behind the lead bricks of the storage area.
   c. Xe 133 will be released into the automatic Pulmonex Xenon Delivery System trap automatically.
   d. Ventilation rate = 372 CFM
      There is no recirculation of this air; 100% is exhausted to the outside (note: exhaust will contain a very small portion of Xe 133, majority of activity will be trapped).

3. Procedure for routine use
   a. The automatic Pulmonex Xenon Delivery System #130-500 which will be used contains automatic venting of gas into trap after each study.
   b. See attachment #3 for patient protocol.

4. Emergency Procedures - see attachment #2

5. Air concentration of Xenon 133 in restricted areas. The Pulmonex Xenon System retains 100% of Xe 133 initially, 90-95% of Xe 133 over the useful life.
   a. Estimated maximum activity used per week = 50 mCi Xe 133.
   b. Estimated fraction of Xe 133 lost during storage and use = 0.25.
   c. Ventilation rate in G.E. camera room = 372 CFM or 2.53×10^{10} cc/40 hr week.
   d. Air concentration:

$$\frac{5 \times 10^{4} \text{ uCi/week} \times 2.5 \times 10^{-1}}{2.53 \times 10^{10} \text{ cc/week}} = 4.94 \times 10^{-7} \text{ uCi/cc}$$

This is well below 1×10^{-5} uCi/cc in a restricted area.

460736

6. Method of Xe 133 disposal
   a. Trap (Automatic Pulmonex Xenon Delivery System)
      Refer to 5 d. This demonstrates that exhausted air will contain concentrations less than 3×10^{-7} uCi/cc.
   b. The trap effluent will be physically monitored weekly. This will consist of collecting effluent in a bag and holding it in front of the imaging camera. If radiation is detected a new trap will be installed prior to further Xe 133 scans.
   c. Saturated filters will be sealed in a container and placed in a lead shielded storage area with the other radioisotope lab wastes prior to removal from the hospital. (Cold trash)

Amendment #1

Attachment #2

Accidents Involving Radioactive Dusts, Mists, Fumes, Organic Vapors and Gases

1. Notify all other persons to vacate the room immediately.
2. Hold breath and close escape valves, switch off air circulating devices, etc., if time permits.
3. Vacate the room.
4. Notify the Radiation Safety Officer at once.
5. Ascertain that all doors giving access to the room are closed and post conspicuous warnings or guards to prevent accidental opening of doors.
6. Report at once all known or suspected inhalations of radioactive materials.
7. Evaluate the hazard and the necessary safety devices for safe re-entry.
8. Determine the cause of contamination and rectify the condition.
9. Decontaminate the area.
10. The Radiation Safety Officer will perform an air survey of the area before permitting work to be resumed.
11. Monitor all persons suspected of contamination.
12. Prepare a complete history of the accident and subsequent activity related thereto for the laboratory records.

460736

Amendment #1

Attachment #3
Page #1

PATIENT PROCEDURE

1. Position patient upright (if condition allows) posterior portion against camera. Using the supraclavicular notch as the superior landmark. Purge the ventilation apparatus with oxygen, placing the mouth piece in the patient's mouth and instructing them not to leak air around the mouth piece or through their nose. Place nose clamps on the patient's nose.

2. When patient has acclimated to breathing on the tubing, and demonstrates no leakage, inject 10 mCi of Xe 133 into the inhalation side of the tubing. Immediately begin 30 seconds wash in image.

3. Image the following at 30 second intervals:
   Posterior Wash in
   LPO
   RPO
   2 minute equilibrium

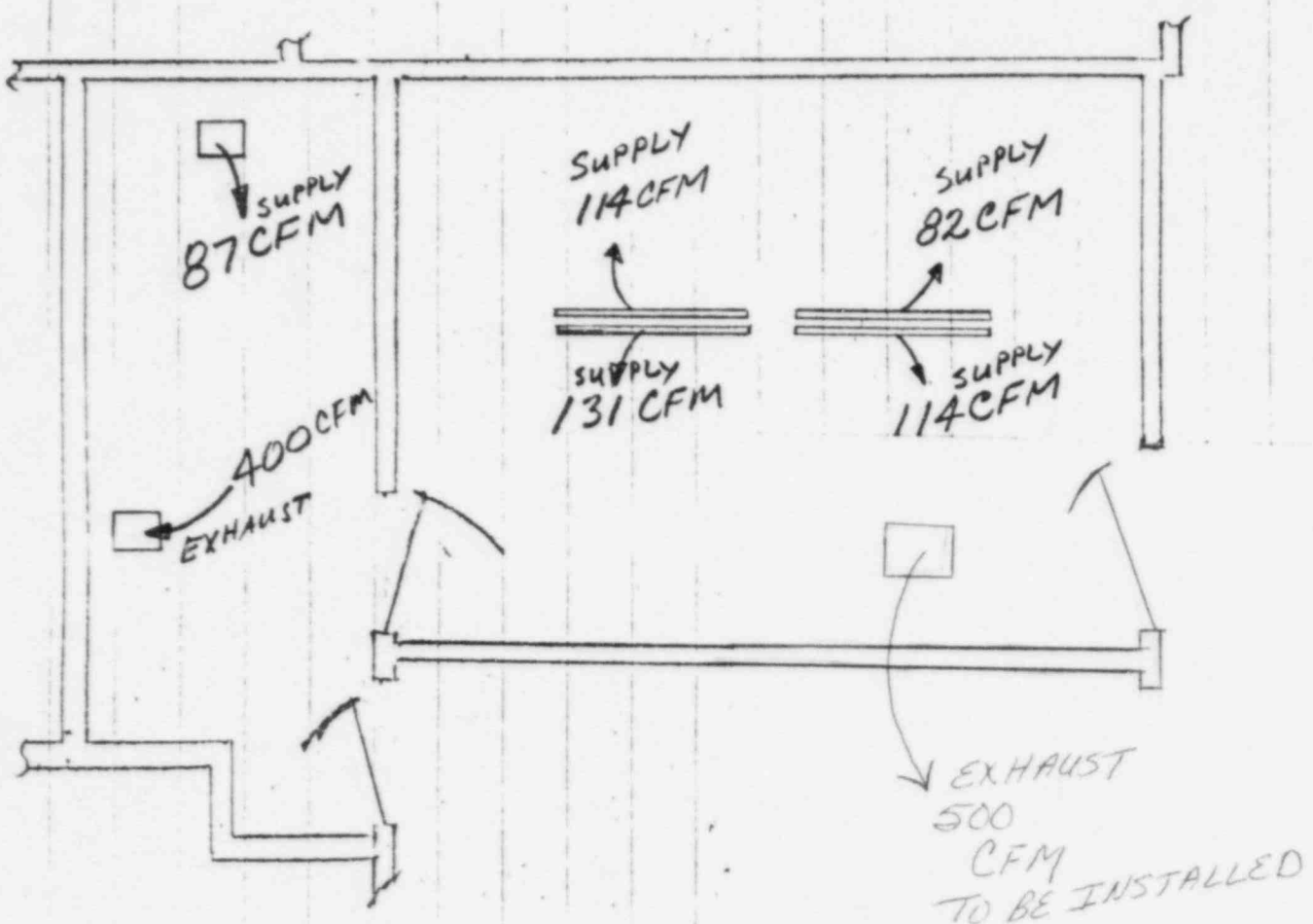
3. At this point, unclamp the exhaust tubing to the apparatus, and allow remaining Xenon to travel into the trap. Start wash out images at 30 second intervals up to 120 seconds.

4. In cases of severe COPD, allow several extra minutes to elapse before exposing the last wash out image.

5. Inject 3-4 mCi Tc 99m Pulmonlite intravenously and follow the protocal for perfusion lung scanning.

Amendment #1

Attachment #4



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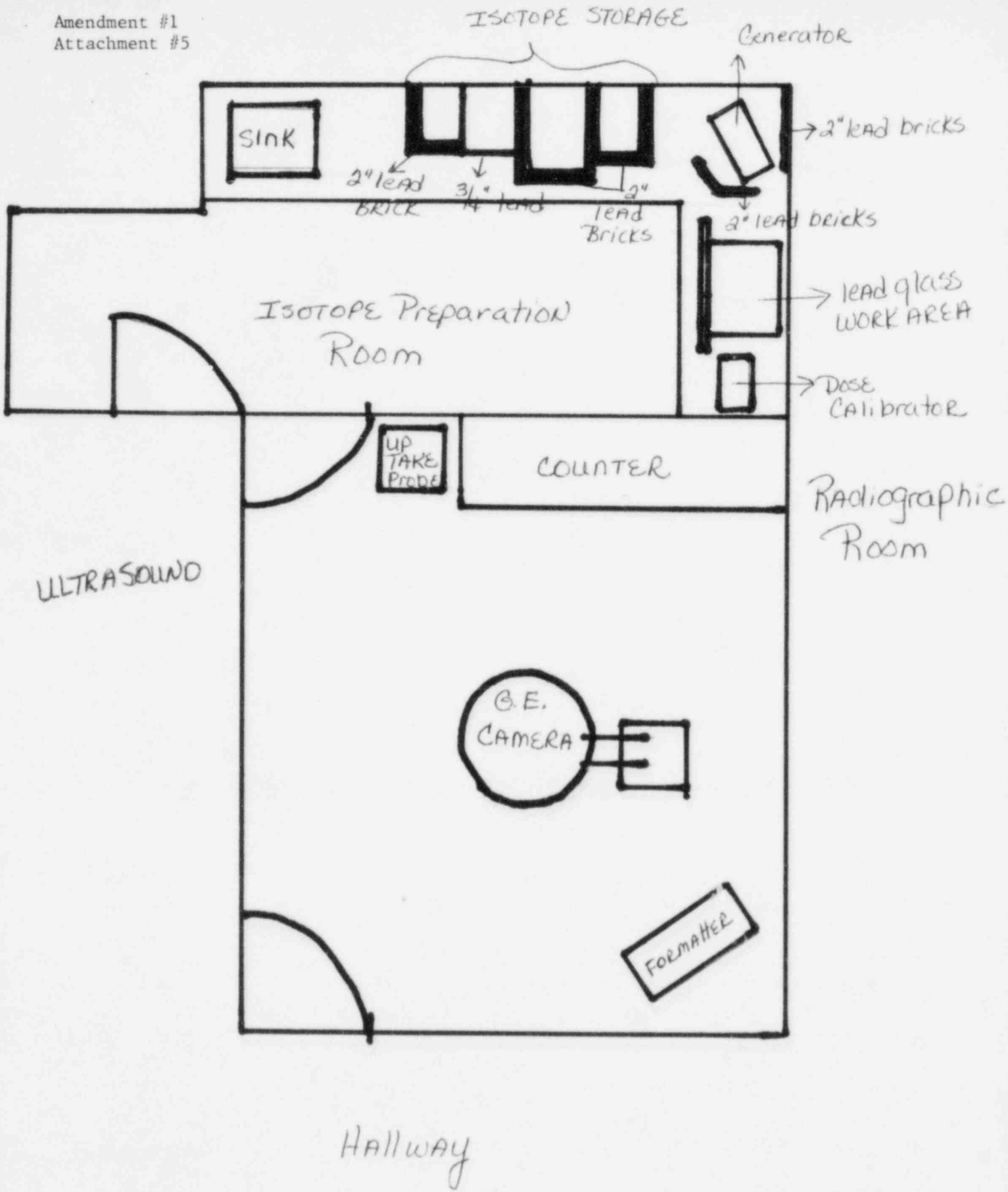
exhaust - 900
Supply - 528
372

Amendment #1
Attachment #5



Amendment #1

UNIQUE NEW "XenAlert"™

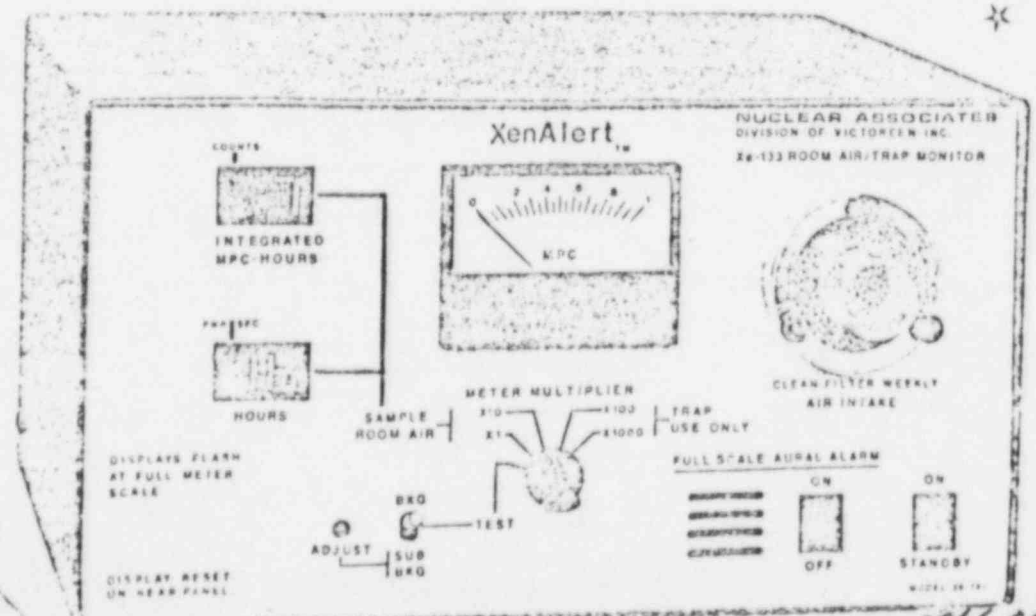
Xenon-133 Room Air/Trap Monitor*

The only instrument
that monitors exposure rate,
continuously integrates and displays the
xenon concentration of room air, in multiples of the
Maximum Permissible Concentration (MPC)[1],
and also monitors the effluent
from xenon gas traps.

- Large meter reads directly in MPC units.
- Digital register shows integrated MPC-Hours.
- Audio and visual alarms alert personnel to hazardous xenon concentrations.
- Fully-shielded counting chamber.
- Compatible with all xenon-dispensing, administration and trapping systems.

(1) The Code of Federal Regulations† clearly limits the permissible ^{133}Xe exposure to 1 MPC for 40 hours per week for 13 weeks. The data is continuously updated and displayed by the "XenAlert" Monitor.

† 10 CFR, Part 20, Sec. 20.103 and Appendix B, Table 1.



Patent pending

†Nuclear Associates

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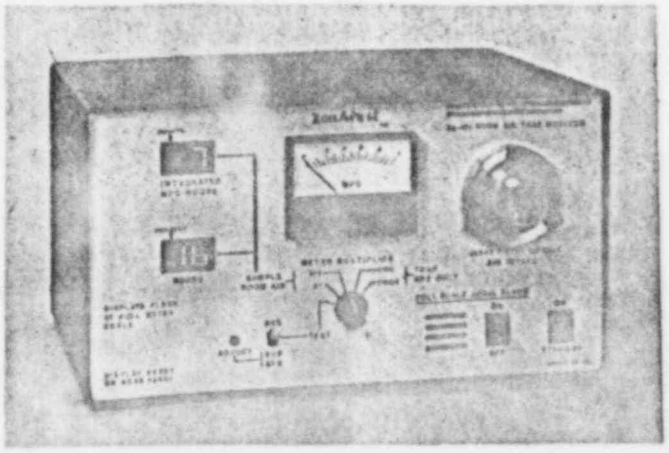
Xenogard™

Xenon-133 Room Air/Trap Monitor

- **Large meter reads directly in MPC units.**
- **Digital register shows integrated MPC-Hours.**
- **Audio and visual alarms alert personnel to hazardous xenon concentrations.**
- **Fully-shielded counting chamber.**
- **Compatible with all xenon-dispensing, administration and trapping systems.**



The only instrument that monitors exposure rate, continuously integrates and displays the xenon concentration of room air, in multiples of the Maximum Permissible Concentration (MPC)[1], and also monitors the effluent from xenon gas traps.

Now, concentrations of xenon-133 in room air *and* gas trap effluent can be quantitatively monitored continuously and accurately with the unique Xenogard Monitor. Unlike present, non-integrating devices, the Xenogard eliminates tedious and complex calculations by automatically computing total exposure (in MPC-Hours units) and exposure rate (in fractions of MPC). Xenon monitoring has never been easier!

Room Air Monitoring

To continuously monitor and integrate room air concentration, the Xenogard is positioned near the xenon administration system and the imaging equipment. Room air is drawn into the counting chamber. Air samples are counted while the air is exchanged more than 3 times per minute. An analog meter continuously displays MPC units while two digital registers display integrated MPC-Hours and total hours (running time) respectively. When the ^{133}Xe room air concentration exceeds full scale, the digital registers flash on and off as a warning to personnel. In addition, an audible alarm can be activated.

At the end of each work day, the Xenogard is switched to "Stand-By." Data acquisition is suspended, but accumulated data is retained in memory. In the morning, or whenever a xenon study is to be performed, the Xenogard is re-activated and data accumulation resumes. At the start of each work week, the Xenogard is reset to zero and the process repeated.

The Xenogard's unique features allow personnel to assess their xenon exposure quantitatively. An accidental release of xenon, such as from a broken vial of an uncooperative patient, may temporarily raise the ^{133}Xe room air concentration well above 1 MPC. The degree to which the NRC limits have been reached, however, depends on the amount of activity released and the time required for the room's exhaust system to exchange the restricted area's air. The Xenogard takes these factors into account with the display of MPC-Hours. Personnel are immediately aware of both the MPC concentration to which they were exposed and the total integrated MPC-Hours, in terms of NRC regulated exposure limits.

Gas Trap Monitoring

The Xenogard greatly simplifies the monitoring of effluent air from any xenon trap. Setting the analog meter multiplier to ×100 or ×1000 displays $10^{-1}\mu$Ci/ml or $10^{-2}\mu$Ci/ml full scale. Concentrations approaching the latter level at the trap's exhaust port can result in a xenon room air concentration approaching 1 MPC. Therefore, the monitor may be used periodically to verify trap performance.

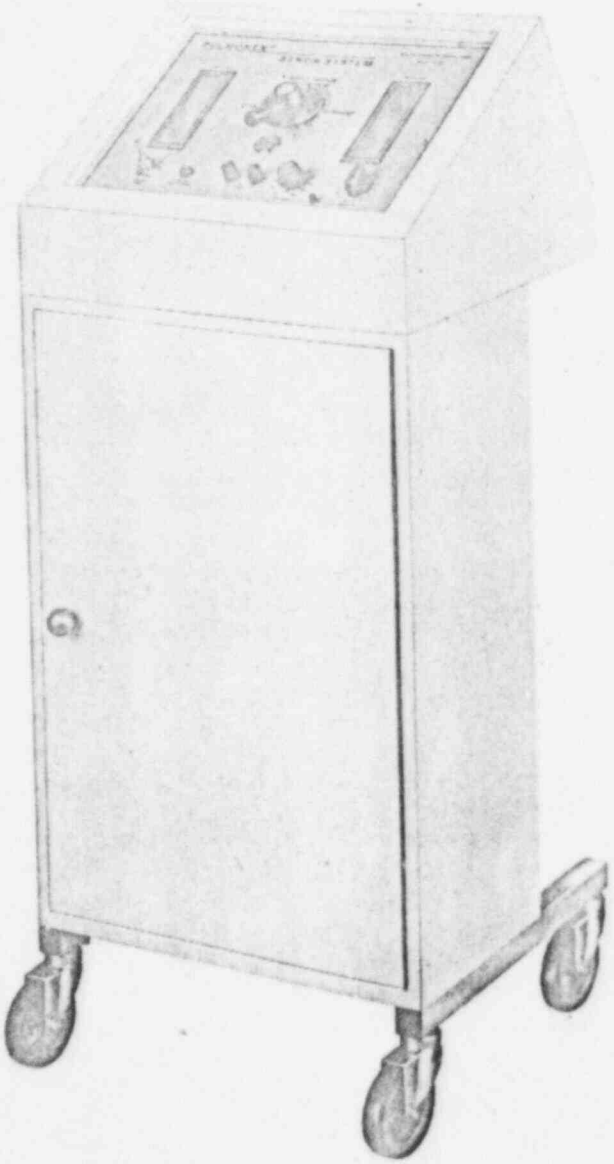
Additional Xenogard Features

- **Background Subtract Circuit.** Permits subtraction of background radiation to assure maximum accuracy when counting ^{133}Xe.
- **Total Hours Register.** Displays total hours of xenon data accumulation.
- **Power Indicator.** Light-emitting diode flashes once per second indicate data accumulation.
- **Integration Disable Circuit.** Suspends MPC-Hours and Hours data accumulation during gas trap monitoring, assuring that the digital registers will display only room air integration values.
- **Emergency Alarm.** Loud alarm is activated automatically when 80 MPC-Hours have been accumulated.

136-751	Xenogard ^{133}Xe Room Air/Trap Monitor, 110V	$1975.00
136-753	Particulate-Matter Replacement Filter. Package of 25 filters	25.00
136-754	Hose for gas trap monitoring, 6-ft.	20.00
136-757	Xenogard, 230V, 50 Hz	2000.00

PULMONEX XENON SYSTEM

One technician can perform an entire study by simply moving a single handle.



SIMPLE, SAFE OPERATION

Full-function xenon delivery system with built-in xenon gas trap for rebreathing, washout, perfusion and single breath studies on supine or seated patients.

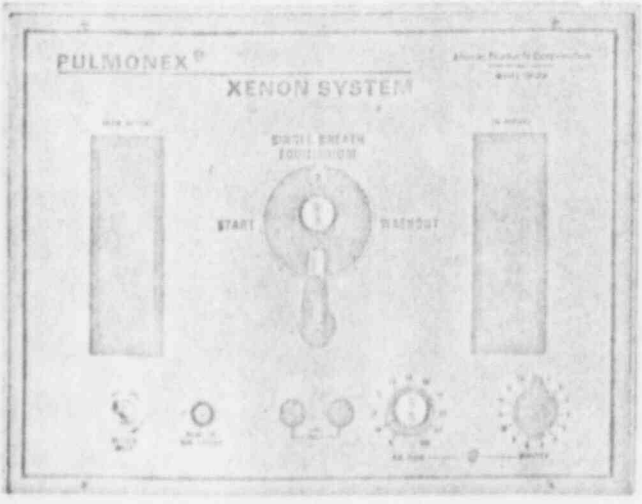
- Complete easy-to-use system.
- "Air-in"/"Air-out" breathing tubes and motor-driven circulator assures resistance-free breathing.
- Two lead glass windows permit observation of patient breathing bags.
- All flow circuits automatically controlled by a master valve system.
- Automatically timed washout.
- Accepts any commercial form of xenon.
- Rolls easily on large casters for positioning of supine or seated patients.
- Fully shielded.
- Carbon dioxide and moisture traps included.

The Pulmonex Xenon System is a simple to use, reliable and complete system for the performance of all regional ventilation studies. A built-in xenon gas trap with disposable charcoal cartridge removes xenon effluent after each study and eliminates the need for expensive venting systems. Motor-controlled air flow assures resistance-free breathing regardless of your patient's pulmonary condition. Practical cabinet design and total mobility permit easy patient positioning in the seated or supine positions.

PULMONEX. .the complete, self-contained xenon system

Pulmonex provides a completely integrated system (delivery unit, and built-in gas trap) for performing xenon studies. A sensitive, responsive master valve, controlled by a single handle on the front panel, and silent synchronized motors permit full-system control of xenon gas flow from initial application to ultimate disposition of the xenon effluent into the gas trap.

All controls are conveniently located on an "up-front" control panel. With the patient on-line, either seated or supine, the user can control the system and observe the patient and gamma camera from one position. The control panel is clearly marked and each mode in the study procedure is distinctively apparent. The two internal patient breathing bags (Air-in and Air-out) are easily observed through individual viewing windows on the front panel. An adjustable manual 15-minute timer initially activates all functions and automatically shuts down the system to complete the study after patient and system washout.



The PULMONEX SYSTEM

The Pulmonex Xenon System effectively integrates manual and electronic controls into a simple, sensitive system that provides maximum, reliable test results using minimum effort. System complexities have been eliminated. All internal circuitry, valves and tubing have been designed to afford ease of operation and patient comfort.

A master valve, controlled by one handle on the front panel, directs the flow of gases throughout the system. Oxygen may be added to the system any time during a study by fingertip button control. A push button operates a circulator blower motor to provide gentle positive system pressure. This, combined with a specially-designed master valve and wide diameter, short circuit airways, provides resistance-free patient breathing. There is no dead air space. An injected bolus of xenon reaches your patient exactly when desired. An in-line CO_2 absorber prevents hyperventilation. The system has automatic timer and pressure control dials to accommodate your patient's breathing pattern and to assure complete system washout into the gas trap.

All internal systems are completely shielded for patient and operator safety. A bacteriostatic filter may be used at the mouthpiece to prevent system contamination.

INTEGRATED XENON GAS TRAP

The Pulmonex system has its own built-in gas trap. Exhaled xenon is gently pulled through activated charcoal contained within a "U" shaped cartridge made of 1/8" lead by an induction vacuum pump. The control panel timer and airflow pressure dial regulation of the trap pump assures complete patient and system purging. Only clean air leaves the trap exit port. Under normal usage the charcoal cartridge will last about a year. The gas trap cartridge is easily replaced when expended.

SPECIFICATIONS:
Motor UL approved. 115 VAC, 50/60 Hz.
Size: 18" x 19" x 46"
Weight: 150 lbs.

130-500	Pulmonex Xenon System, complete	$2750.00

Replacement Items

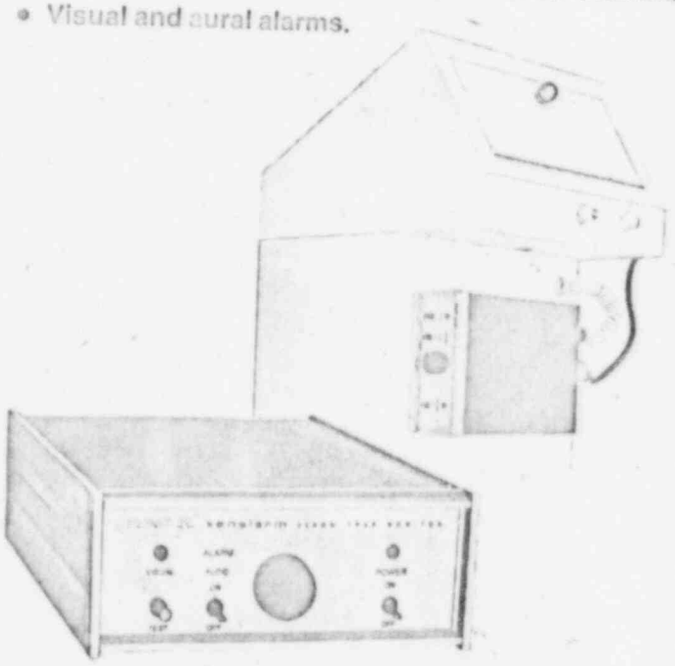
127-319	Replacement Charcoal Cartridge ...	325.00
130-550	Disposable Mouthpiece	1.95 ea.
130-700	Disposable Bacteria Filter	3.25 ea.
139-101	Moisture Absorber (Drierite)	7.50 lb.
130-019	Soda Lime, CO_2 Absorber	5.25 lb.
087-130	220V Converter	150.00

460736 29

Amendment #1

Xenalarm Xenon Trap Monitor

- Simple, sensitive, compact unit immediately alerts user to excess concentrations of radioactive xenon.
- Visual and aural alarms.



Placed at the exhaust port of any xenon gas trap, the Xenalarm monitors the xenon exhaust level and automatically trips a visual and aural alarm when concentrations of radioactive xenon exceed 1×10^{-2} μCi/ml. NRC and State agencies require that the xenon concentration in controlled areas does not exceed 1×10^{-3} μCi/ml averaged over one year based on a 40 hour work week. Xenalarm allows an exhaust rate in excess of the limit as the exhaust is diluted in the room and still further diluted by virtue of the required room ventilation.

The detector is a sensitive end window G-M tube inserted directly in the exhaust stream. The system measures both beta and gamma emissions of xenon.

A "beeper" audio alarm and a flashing red light warn of excessive radioactive xenon. The audio alarm may be turned off at any time by a simple "off-on" switch. Should the alarm activate during or after a study, the charcoal cartridge in the trap should be changed immediately after the completion of the study.

The "Test" button permits manual activation of the alarm system to ascertain its operation. A method to calibrate the unit with a known ^{137}Cs source is provided.

The complete unit measures 8-1/2" W × 3-11/16" H × 13-3/16" D.

136-250	Xenalarm Xenon Trap Monitor, 110V	$875.00
136-257	Xenalarm Xenon Trap Monitor, 230V	975.00

RADIATION SAFETY COMMITTEE

C. Read Vaughan, M.D.	Radiology (RSO)
Robert F. Kellenberger, M.D.	Pathology
Jack L. Davis, M.D.	Internal Medicine
Susan Sorg, R.T. R.N.M.T.	Manager - Diagnostic Imaging
Christine K. Egle R.T. (N) C.N.M.T.	Chief Nuclear Medicine Technologist
Eugene Johnson	Hospital Administrator
David J. Rickles, M.D.	Radiation Oncology
Camille Scott, R.N.	Director of Nursing Services

DUTIES

1. Review and grant permission for, or disapprove, the use of by-product material within Kalispell Regional Hospital from the standpoint of radiological health and safety of patients or working personnel and other factors which the committee may wish to establish for medical uses of by-product materials prior to submission of an application to the Commission for licensing action.

2. Prescribed special conditions that will be required during a proposed use of by-product material such as requirements for bioassays and physical examinations of users, minimum level of training and experience of users.

3. Receive and review records and reports from the radiological safety officer or other individuals delegated responsibility for health safety practices in Kalispell Regional Hospital.

4. Recommend remedial action to correct safety infractions.

5. Formulate and review Kalispell Regional Hospital's training programs for the safe use of radioisotopes.

6. Maintain written records of actions taken by the committee.

7. Inform the Commission of any changes in committee membership.

COMMITTEE ADMINISTRATIVE PROCEDURES

1. A meeting schedule to review safety aspects of present programs and to consider special cases or problems.

2. Record keeping procedures for committee meetings, actions, recommendations, and decisions.

3. A program for the preparation and dissemination of information pertaining to radiation safety.

4. The delegation of responsibility to a designated technologist for the conduct of the day-to-day radiation safety program, including appropriate surveys and maintenance of records.

5. Maintenance of written records of receipts, transfers, and disposal of all radioactive isotopes in Kalispell Regional Hospital and maintenance of an inventory of the total quantity of each radioisotope possessed at Kalispell Regional Hospital.

COMMITTEE ADMINISTRATIVE PROCEDURES (CON'T)

6. Provisions for initiating corrective action as necessary to assure radiation safety

7. Annual comprehensive review of the Radiation Safety Program.

8. Frequency of meetings will be monthly.

KALISPELL REGIONAL HOSPITAL
KALISPELL MONTANA 59901
PH: 755-5111

Amendment #3

August 5, 1985

Gentlemen:

In reference to Item 7, Medical Isotope Committee, page 2, procedure number 8.

It now states that the frequency of meetings will be monthly. We would like to request an amendment to hold quarterly meetings instead.

Sincerely,

C. Read Vaughan, M.D., RSO

Amendment #4

NRC FORM 313M SUPPLEMENT A (9-81) 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
Michael B. Wickersham, M.D.	Montana, Washington

3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C
American Board of Radiology	Radiology	June 1984

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	Sacred Heart Medical Center Spokane, Washington 99203 Physics Instructor-Fr. Neeland PhD	90	15
b. RADIATION PROTECTION	Gonzaga University Spokane, Washington	25	10
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	Clinical Preceptor E. Holmes, M.D. SHMC Spokane	20	5
d. RADIATION BIOLOGY		20	-
e. RADIOPHARMACEUTICAL CHEMISTRY		30	5

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Tc 99M	30 m Ci	Sacred Heart Med. Center	4 monthes	Diagnostic
Th 201	2.4 m Ci	"	"	"
In 111	500 μCi	"	"	"
I 123	300 μCi	"	"	"
Ga 67	5 m Ci	"	"	"
XE 133	20 m Ci	"	"	"
I 131	15 m Ci	"	"	Therapy

NRC FORM 313M SUPPLEMENT B
(9-81)

U. S. NUCLEAR REGULATORY COMMISSION

PRECEPTOR STATEMENT

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

1. APPLICANT PHYSICIAN'S NAME AND ADDRESS

FULL NAME: Michael B. Wickersham, M.D.

STREET ADDRESS: Kalispell Regional Hospital

CITY: Kalispell | STATE: MT | ZIP CODE: 59901

KEY TO COLUMN C

PERSONAL PARTICIPATION SHOULD CONSIST OF:

1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage.

2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data.

3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.

2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
I-131 or I-125 I 123	DIAGNOSIS OF THYROID FUNCTION	45	
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME		
	LIVER FUNCTION STUDIES		
	FAT ABSORPTION STUDIES		
	KIDNEY FUNCTION STUDIES		
	IN VITRO STUDIES		
OTHER	I 131 dippuran (renal)	5	
I-125	DETECTION OF THROMBOSIS		
I-131	THYROID IMAGING I 123	20	
P-32	EYE TUMOR LOCALIZATION		
Se-75	PANCREAS IMAGING		
Yb-169	CISTERNOGRAPHY / In111	6	
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES	30	
OTHER	Th 201	75	
Tc-99m	BRAIN IMAGING	15	
	CARDIAC IMAGING	25	
	THYROID IMAGING	5	Tc 99M (CONT.)
	SALIVARY GLAND IMAGING		
	BLOOD POOL IMAGING		Tc99M Cholescintigraphy 20 Venography 10 GI Blood Loss 15 Meckel's 5 G.E. Reflux 5 Renal 35
	PLACENTA LOCALIZATION		
	LIVER AND SPLEEN IMAGING	60	
	LUNG IMAGING	45	
	BONE IMAGING	125	
OTHER	Ga 67 ; In 111 WBC	9 ; 14	

PRECEPTOR STATEMENT *(Continued)*

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

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS *(Additional information or comments may be submitted in duplicate on separate sheets.)* D
P-32 *(Soluble)*	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA, AND BONE METASTASES		
P-32 *(Colloidal)*	INTRACAVITARY TREATMENT		
I-131	TREATMENT OF THYROID CARCINOMA	0	
	TREATMENT OF HYPERTHYROIDISM	11	
Au-198	INTRACAVITARY TREATMENT		
Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	INTRACAVITARY TREATMENT		
I-125 or Ir-192	INTERSTITIAL TREATMENT		
Co-60 or Cs-137	TELETHERAPY TREATMENT		
Sr-90	TREATMENT OF EYE DISEASE		
	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR	10	
Sn-113/ In-113m	GENERATOR		
Tc-99m	REAGENT KITS	50	
Other			

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

Mar-Jun 1981 Approx. 720 hours

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

a. NAME OF SUPERVISOR

E. Holmes, M.D.

b. NAME OF INSTITUTION

Sacred Heart Medical Center

c. MAILING ADDRESS

W. 101 8th Ave.

d. CITY

Spokane, Washington 99203

5. MATERIALS LICENSE NUMBER(S)

6. PRECEPTOR'S SIGNATURE

Edward R Holmes MD

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

Ed Holmes, M.D.
Chief of Nuclear Medicine
Sacred Heart Medical Center

8. DATE

NRC FORM 313M SUPPLEMENT B
(9-81)

460736

Amendment #5
Attachment #1

APPENDIX C

INSTRUMENTATION

1. Survey meters

   a. Manufacturer's name Atomic Products Corporation

   Manufacturer's model number 069-701

   Number of instruments available 1

   Minimum range .01 mR/hr to .05 mR/hr

   Maximum range 10 mR/hr to 50 mR/hr

   b. Manufacturer's name Victoreen

   Manufacturer's model number 740-5

   Number of instruments available 1

   Minimum range 1 mR/hr to 25 mR/hr

   Maximum range 1000 mR/hr to 25000 mR/hr

2. Dose Calibrator

   Manufacturer's name Capintec, Inc.

   Manufacturer's model number CRC-7

   Number of instruments available 1

3. Instruments used for diagnostic procedures

Type of Instrument	Man. name	Model No.
Gamma Camera	General Electric	4E-400540G1
Gamma Camera	Picker	DYNA MO 1660C
Uptake-Spectrometer	Ludlum	261
Well Counter	General Electric	H30100
Computer	MDS	A^2/A^3
Treadmill-Monitor	Marquette	Series 6500

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

Item 9
May 6, 1985

460736