

7/28-DCS



ST. ANTHONY'S MEDICAL CENTER

Robert Hyland
Chairman of the Board

Robert L. Morris
President

June 20, 1980 Applicant...
Check No. 6483
Amount Fee \$40 (28)
Type of Fee Amendment
Date Check Recd JUL 18 1980
Received By. [Signature]

RECEIVED BY LFMB
Date JUL 18 1980
Log July 18 1980
By [Signature]
Orig. To [Signature]
Action Compl. 7/23/80

Medical Licensing
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Gentlemen:

Please amend our byproduct license for possession and use of 133Xe. In support of this request, we submit the following for your consideration.

- A. 1. We estimate that we will perform approximately 260 procedures per year, using 10mCi/patient.
2. We request a possession limit of 0.5 Curies of 133Xe.
- B. 1. Enclosed is a diagram of our Nuclear Medicine Facilities. All 133Xe procedures will be performed in our Scanning Room.
2. In the Scanning Room, there is a net negative ventilation rate of 20 cubic feet per minute. The supply and exhaust is vented to the roof of our facility, capped with a mushroom top, with no building or structure within 100 feet.
- C. 1. During the performance of the study, all necessary personnel will be evacuated from the area, an area monitor will be available to detect any abnormal increase in radioactivity.
2. A brochure describing the apparatus which we intend to use is enclosed with this correspondence. We intend to use an activated charcoal trap on the exhaust of the apparatus and a radiation monitor to monitor the effluent. The monitor will undergo full calibration at least annually and day of use calibrations.
3. To minimize the release of activity into the scanning room, the patient's nose will be clamped during the study.

10010 Kennerly Road • St. Louis, Missouri 63128 • (314) 842-5600

Control No. 03504

501110780

JUN 27 1980

Medical Licensing
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

- D. 1. In the event of accidental release, the Scanning Room will be evacuated of all personnel until the area monitor indicates that the radiation level has returned to acceptable levels.

- E. 1. We estimate that we will use:

$$\frac{10\text{mCi}}{A = \text{patient}} \times \frac{5 \text{ patients}}{K} \times \frac{\text{uCi}}{\text{mCi}} = 5.0 \times 10 \text{ uCi/wk}$$

in the area.

2. We estimate the 25% of the activity will be lost during use. Therefore, $f = .25$.

3. The required ventilation rate is given by:

$$V = \frac{A \times f}{1 \times 10^{-5} \text{ mCi/ml}}$$

$$V = \frac{5 \times 10 \text{ mCi/wk} \times 0.25}{1 \times 10^{-5} \text{ mCi/ml}} = 1.25 \times 10^9 \text{ wk}$$

$$\frac{1.25 \times 10^9 \text{ ml/wk}}{40 \text{ hours/wk}} \times \frac{1 \text{ cfm}}{1.7 \times 10^6 \text{ ml/hr}} = 18.4 \text{ cfm}$$

Since our ventilation rate in the scanning is 20 cfm, our release of activity into restricted areas is in accordance with 10CFR Part 20.

- F. 1. We estimate that we will need to dispose of:

$$A = \frac{10\text{mCi}}{\text{patient}} \times \frac{5 \text{ patients}}{\text{week}} \times \frac{10^3 \text{ uCi}}{\text{mCi}} \times \frac{52 \text{ wks}}{\text{year}} \times$$

$.02 = 5.2 \times 10^4 \text{ uCi/yr. of activity. This is assuming that the activated charcoal trap is 98% efficient.}$

Our ventilation rate provides:

$$V = 20\text{cfm} \times 1.49 \times \frac{10 \text{ ml/yr}}{10 \text{ cfm}} = 2.98 \times 10^{11} \text{ ml/yr}$$

Therefore, the average concentration of activity released to unrestricted areas is:

$$C = \frac{5.2 \times 10^4 \text{ uCi/yr}}{2.98 \times 10^{11} \text{ ml/yr}} = 1.8 \times 10^{-7} \frac{\text{mCi}}{\text{ml}}$$

which is in compliance with requirements of 10CFR Part 20.

ST. ANTHONY'S MEDICAL CENTER
St. Louis, MO 63128

Page 3

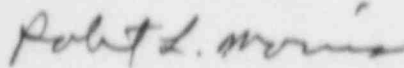
Medical Licensing
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

As indicated above, the effluent will be monitored with a survey meter. If the level exceeds a present limit, indicating that the trap is saturated, it will be replaced. Saturated traps will be disposed of with our normal radioactive waste.

We hope this letter is sufficient for you to evaluate this request, and we await your prompt reply.

Sincerely,

ST. ANTHONY'S MEDICAL CENTER

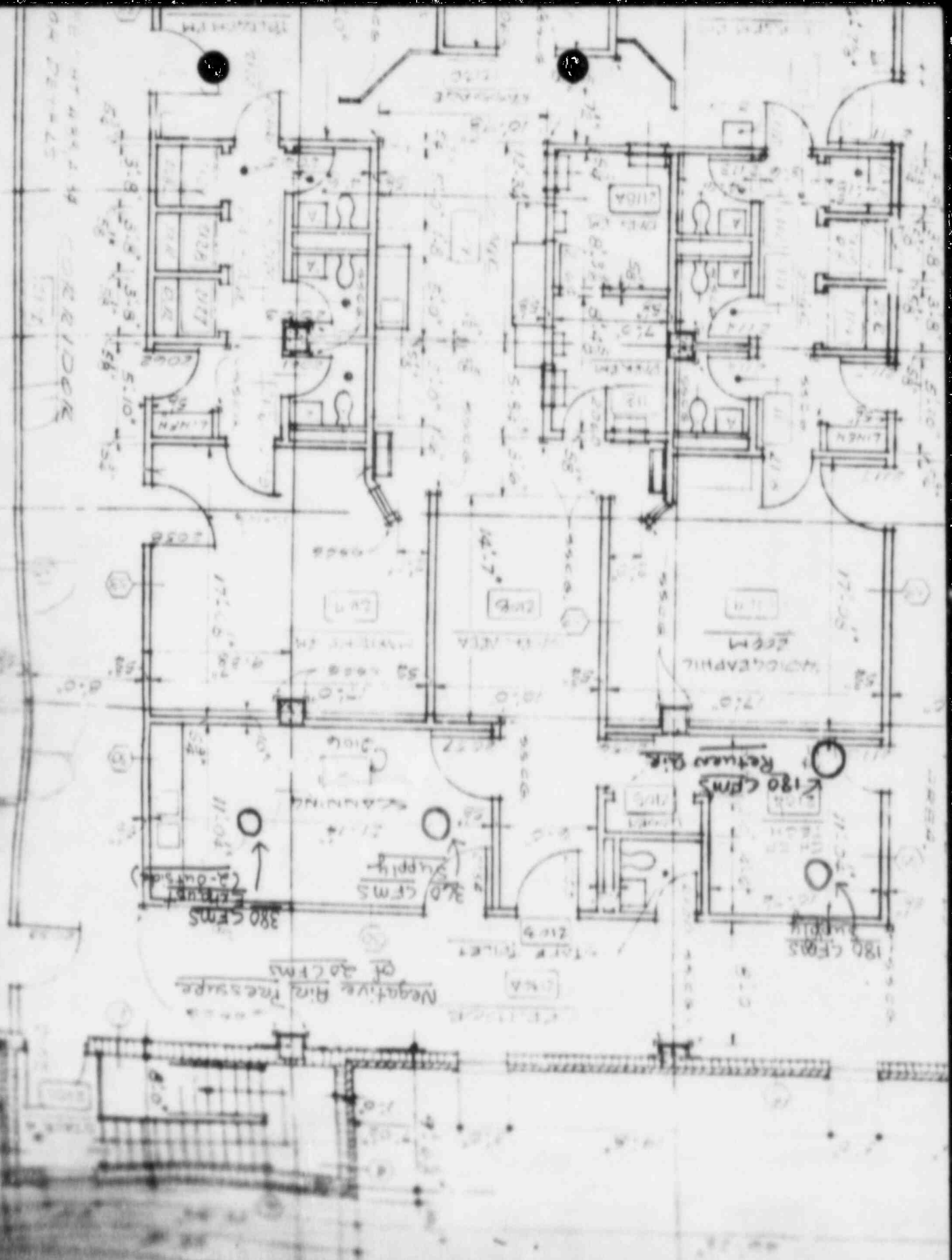


Robert L. Morris
President

dah

Enclosures -- two

CORRIDOR
ELEVATOR



Negative Air Pressure
of 30 CFM

180 CFM Supply

180 CFM Supply

380 CFM Supply

380 CFM Supply

Atomlab

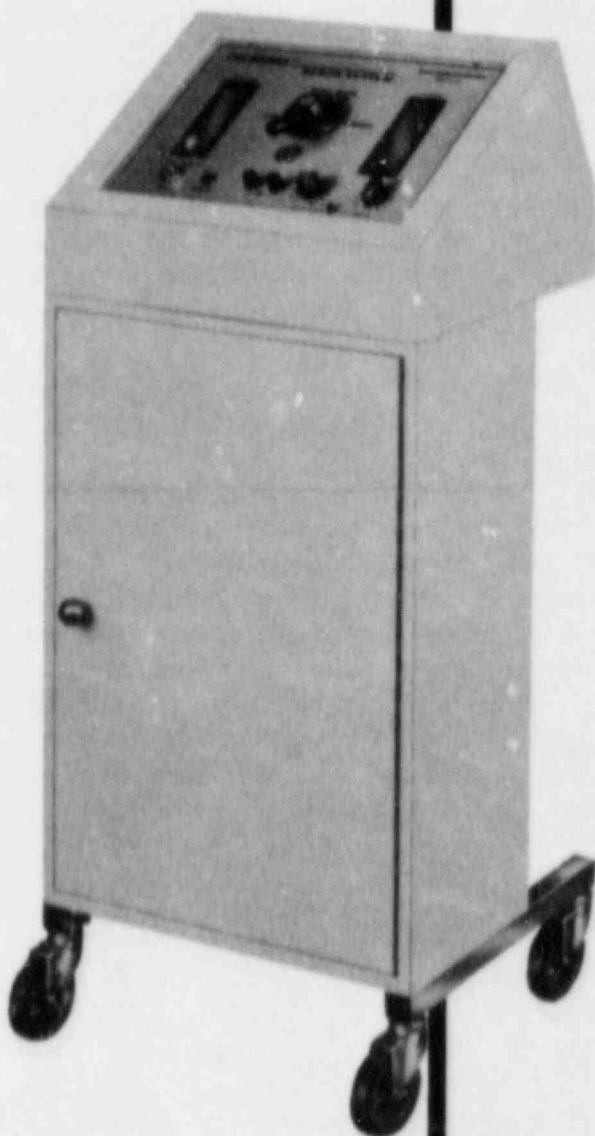
Full-function xenon delivery system with built-in xenon gas trap for rebreathing, washout, perfusion and single breath studies on supine or seated patients.

PULMONEX XENON SYSTEM

with integrated GAS TRAP.

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

- 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.



Atomic Products Corporation

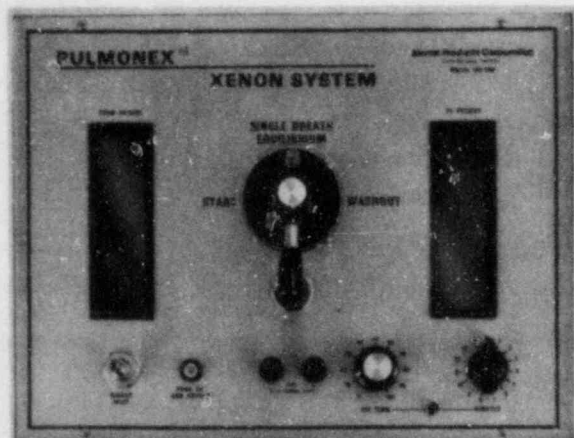
Center Moriches, New York 11934, U.S.A.
(516) 878-1074

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 CO₂ 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 expanded.

Specifications:

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

130-500	Pulmonex Xenon System	\$ 2495.00
127-318	Replacement Charcoal Cartridge for Gas Trap	200.00