

LAWRENCE COUNTY GENERAL HOSPITAL

A Community Organization Operated for the Benefit of Its Patients
2228 SOUTH 9th — HOSPITAL SQUARE PHONE 532-3231
IRONTON, OHIO 45638

March 3, 1985

United States
Nuclear Regulatory Commission
Material Licensing Branch
Division of Fuel Cycle and
Material Safety
Washington, D.C. 20555

Gentlemen:

Lawrence County General Hospital wishes to continue to operate under its current license No.#34-16241-01.

Our current license accurately represents Nuclear Medicine program, and we will continue to operate in accordance with those documents and applicable N.R.C. Regulations and License conditions.

Sincerely,

Robert Taylor et al. (N)

Technical Director
Radiology

| | |
|------------------|-------------|
| Applicant | Mad |
| Check No. | 28855 |
| Amount | \$150 |
| Fee Category | EXPC |
| Type of Fee | Ren |
| Date Check Rec'd | 3/19/85 |
| Received By | [Signature] |

U.S. N.R.C.
LIC. FEE MGMT. BRANCH

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FEE EXEMPT

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REG3 LIC30
34-16241-01 PDR

file

AUG 29 1984

Lawrence County General Hospital
ATTN: Robert Taylor, R.T. (N)
Technical Director of Radiology
2228 South 9th St.
Ironton, OH 45638

Gentlemen:

Enclosed is Amendment No. 05 to your NRC License No. 34-16241-01 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. You must conduct your program involving radioactive materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instruction and Reports to Workers; Inspection," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Possess radioactive material only in the quantity and form indicated in your license.
3. Use radioactive material only for the purpose(s) indicated in your license.
4. Notify NRC in writing of any change in mailing address.
5. Request and obtain appropriate amendment if you plan to change ownership of your organization, change locations of radioactive material, or make any other changes in your facility or program which are contrary to your license conditions or representations made in your license application and any supplemental correspondence with NRC. Any amendment request should be accompanied by the appropriate fee specified in 10 CFR Part 170.
6. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date on your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of radioactive material after your license expires is a violation of NRC regulations.
7. Request termination of your license if you plan to permanently discontinue activities involving radioactive material prior to your expiration date.

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NMS LIC30
34-16241-01 PDR

2 pp.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions and representations in your license application will result in enforcement action against you in accordance with the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C.

If you have any questions or require clarification of any of the above stated information, contact us at (312) 790-5625.

Sincerely,

Original Signed
George M. McCann
Materials Licensing Section

Enclosures:

1. Regulatory Guide 10.8
(Including ALARA Program
Appendix O)
2. Amendment No. 05
3. 10 CFR Parts 19 and 20

LAWRENCE COUNTY GENERAL HOSPITAL

A Community Organization Operated for the Benefit of Its Patients

2228 SOUTH 9th — HOSPITAL SQUARE PHONE 532-3231
IRONTON, OHIO 45638

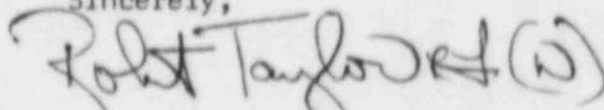
August 14, 1984

Region III Materials License Division
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Sir,

- 1.) Room air will be exhausted outside the hospital to an area of little traffic.
- 2.) No air will recirculate into the hospital by vents or other means.
- 3.) Exhaust fan will run continuous.
- 4.) The Nuclear Medicine Department will follow the manufacturers procedure for trap exhaust check. Procedure Attached.

Sincerely,



Robert Taylor, R.T. (N)
Technical Director of Radiology.

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AUG 27 1984
REGION III

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NMS LIC30
34-16241-01 PDR

5 pp.

AUG 27 1984

CONVERSATION RECORD

TIME

11:25 pm

DATE

19 July 1984

TYPE

☐ VISIT☐ CONFERENCE☒ TELEPHONE☐ INCOMING☒ OUTGOING

Location of Visit/Conference:

→ 19 July 84 Karen Webb

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

Robert Taylor, R.T. (N)

Technical Director of Radiology

ORGANIZATION (Office, dept., bureau, etc.)

Lawrence G. Gen Hosp
Ironton, Ohio

TELEPHONE NO.

(614) 532

3231

SUBJECT

Amendment to add xenon ¹³³
Control No. 76780

ROUTING

NAME/SYMBOL

INT

SUMMARY

- 1) where does air exhaust to & where are nearest intakes to hosp located?
 - 2) Is any air recirculated into hosp?
 - 3) Does exhaust from scanning run continuously? If not see 4
 - 4) If any of conditions in 2 or 3 should exist, licensee needs to submit calculation demonstrating compliance with MPES
 - 5) clarify statement under C. That routine quality control procedure is reduced to comparing to an ~~actual~~ observed reading to a decision point??
 - any other exhaust?? in scanning area?
 - 5) Regarding weekly trap test is volume collected during wash-out phase
 - 6) submit completed Survey meter Response To Xe¹³³ In three-liter bottle with unit indicated in all calculation - any publication on method would be good
- Requested response within 30 days

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION

Mike McCann

SIGNATURE

George W. McCann

DATE

19 July 1984

ACTION TAKEN

SIGNATURE

TITLE

DATE

LAWRENCE COUNTY GENERAL HOSPITAL

A Community Organization Operated for the Benefit of Its Patients

2228 SOUTH 9th — HOSPITAL SQUARE PHONE 532-3231
IRONTON, OHIO 45638

August 14, 1984

Region III Materials License Division
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Sir,

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- 2.) No air will recirculate into the hospital by vents or other means.
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Sincerely,

Robert Taylor, R.T. (N)
Technical Director of Radiology.

RECEIVED
AUG 17 1984
REGION III

AUG 17 1984

Atomlab

INSTRUCTION MANUAL

PULMONEX XENON SYSTEM

130-500

3-STEP SIMPLICITY OF OPERATION

1. Start: Set timer. Patient adjusts to breathing on system. Add oxygen. Set "Airflow" control. Switch handle to 2.
2. Single Breath Equilibrium: Patient is breathing on closed loop. Inject Xenon at mouthpiece. Patient breathes until equilibrium (about 2 minutes). More oxygen may be added during 2, if necessary. Switch to 3.
3. Washout: Patient breathes room air through unit, exhales into trap. Study is complete.

To thoroughly familiarize yourself with the equipment and methodology, it is suggested that you run through the procedure several times, first without any patient, then with a colleague as a "patient" without actually using xenon. When you are completely familiar with the routine, you can start doing xenon studies on a patient with confidence.

FOLLOW THESE SIMPLE STEPS CAREFULLY:

A. Setting Up Your Pulmonex

1. Open the top rear door. Inspect the interior. All hoses should be connected to their respective ports. Bags should be lying flat. The elbows on the bags should be in their wall brackets. Hoses should not be kinked.
2. Open the lower front door. All hoses should be connected to their respective ports.
3. Remove the empty plastic cartridge that hangs in the lower compartment. Fill the cartridge about 1/4 to 1/3 full with the blue drierite (139-101) and return the cartridge. This serves as a moisture trap for the air going into the charcoal cartridge. Close the lower compartment. Replace the drierite when it changes color (from blue to pink). *Failure to change the drierite will significantly shorten the life of the charcoal cartridge.*
4. Remove the empty plastic cartridge that is within the top compartment. Fill 1/4 to 1/3 full with white granule soda lime (Model #130-019). Reconnect to the hoses. This soda lime serves as a carbon dioxide trap. Close the top rear door. Change the soda lime between each patient. *Failure to change the soda lime will cause the patient to rebreathe too much carbon dioxide thus causing hyperventilation.*
5. Bring the unit to the area of operation. Make sure the timer is on "0" and plug into a nearby electrical outlet.
6. At the rear of the unit, there are two white hose connections, side by side. Attach the breathing tubes/Y Fitting/bacteria filter/mouthpiece assembly to the hose connections. The plastic plug and warning label on the Y fitting must be facing up.

Note: Keep the breathing tubes as short as possible. If a patient is supine bring the system to the bedside. Never add a length of tubing to the patient side of the Y fitting. If you need more tubing length replace both breathing tubes. The distance from the Y to the patient must be as short as possible.

It is advisable to use hose clamps to tightly fasten the breathing hoses to the hose connections. As a safety precaution you can connect a hose from your room vent to the exhaust port on the Pulmonex. This exhaust port is located on the patient side of the Pulmonex just below the overhang.

Caution: Some patients are sensitive to oxygen. Consult a physician before using oxygen. If the physician prefers, substitute room air for oxygen.

7. To add oxygen connect and clamp a 1/4" oxygen hose from your oxygen supply to the oxygen inlet port on the Pulmonex front panel. Turn the oxygen valve to 5 psi or 6.8 liters/minute and leave it on. If possible, use a pediatric regulator on the oxygen tank.

Note: Use a flow regulator, not a flow meter. Flow rates can be high (up to 50 liters/min.) but pressure must be low, 5 psi.

B. Performing a Study.

8. Using a source, position the patient in front of the scintillation camera. See that both the lungs are within the crystal area.
9. Set the camera for Xe-133. Record all data on tape.
10. Place the Pulmonex as close to the patient as possible and set the handle to the "Start" position. The number "1" will appear under the handle.
11. Set the "Air Flow" control to 30 (an arbitrary figure that can be changed to accommodate the patient's breathing pattern).
12. Press the button on the front panel to add oxygen to the "To Patient" bag. Only add a small amount of oxygen, about 1/4 full. (The bag will only move slightly, do not fill it up.) More oxygen can be added later if the patient requires. In many cases, it is possible not to add any oxygen and perform the entire study on ambient air. In all cases, the oxygen is only to enrich the air in the circuit.

To do a study with ambient air, before connecting the patient to the system, turn the Pulmonex on and go to position #2. When the "To Patient" bag is 1/4 full, switch the handle back to position #1. Now the system is ready to use.
13. Set the timer to 9 minutes (an arbitrary figure that can be changed at any time depending on the study procedure you prefer).
14. Place the mouthpiece in the patient's mouth. Clamp the patient's nose closed. A face mask may be used, if preferred. Place a vertex cape (#055-101) on the patient.
15. Have the patient breathe briefly on "Start" to become accustomed to breathing with a mouthpiece. The "from patient" bag will move slightly as the patient exhales.
16. Switch the handle to "Single Breath, Equilibrium, #2". With a NEN Gun or syringe filled with xenon, puncture the mouthpiece's rubber with the needle and add the xenon as you have the patient take a deep inspiration. Have the patient hold his breath for as long as possible and then continue to breathe normally. Increase the "Air Flow" control to about 70, (an arbitrary figure that can be changed to accommodate the patient's breathing pattern).

Advise the patient to breathe slowly and normally. Observe both breathing bags moving through the front panel windows. Add oxygen if the patient requires it. An alternative to puncturing the mouthpiece is to use the luer adapter plug provided with the system.

A common problem is the xenon not getting into the patient for single breath. If this happens, try again with these changes:

- A. Lower the "Air Flow" control to 20 or 10 five seconds before xenon administration.
- B. Puncture the mouthpiece closer to the patient.
- C. Have the patient take a deeper breath.

030-10838

Lawrence County General Hospital
2228 South 9th St.
Ironton, Ohio 45638
Department of Radiology

May 11, 1984

Region III Materials License Division
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Sirs:

Please amend our N.R.C. License #34-16241-01 to include Xenon 133 Gas, which will be used to perform pulmonary ventilation studies.

I am also requesting an amendment be made as to the area where waste is held for decay. A floor plan is attached locating this new area. No changes will be made in the procedures necessary for final disposal.

Sincerely,

Robert Taylor R.T.(N)

Robert Taylor, R.T. (N)
Technical Director of Radiology

| | |
|---------------------|-------|
| Applicant | |
| Check No. | |
| Amount Fee Category | |
| Type of Fee | |
| Date Check Rec'd | |
| Received By | |

| | |
|------------------|-------------|
| RECEIVED BY LFMB | |
| Date | 5/21/84 |
| Leg | may 19 1144 |
| By | CP |
| Orig. To | R.T. |
| Action Compl | CP |

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FEE EXEMPT
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MAY 15 1984

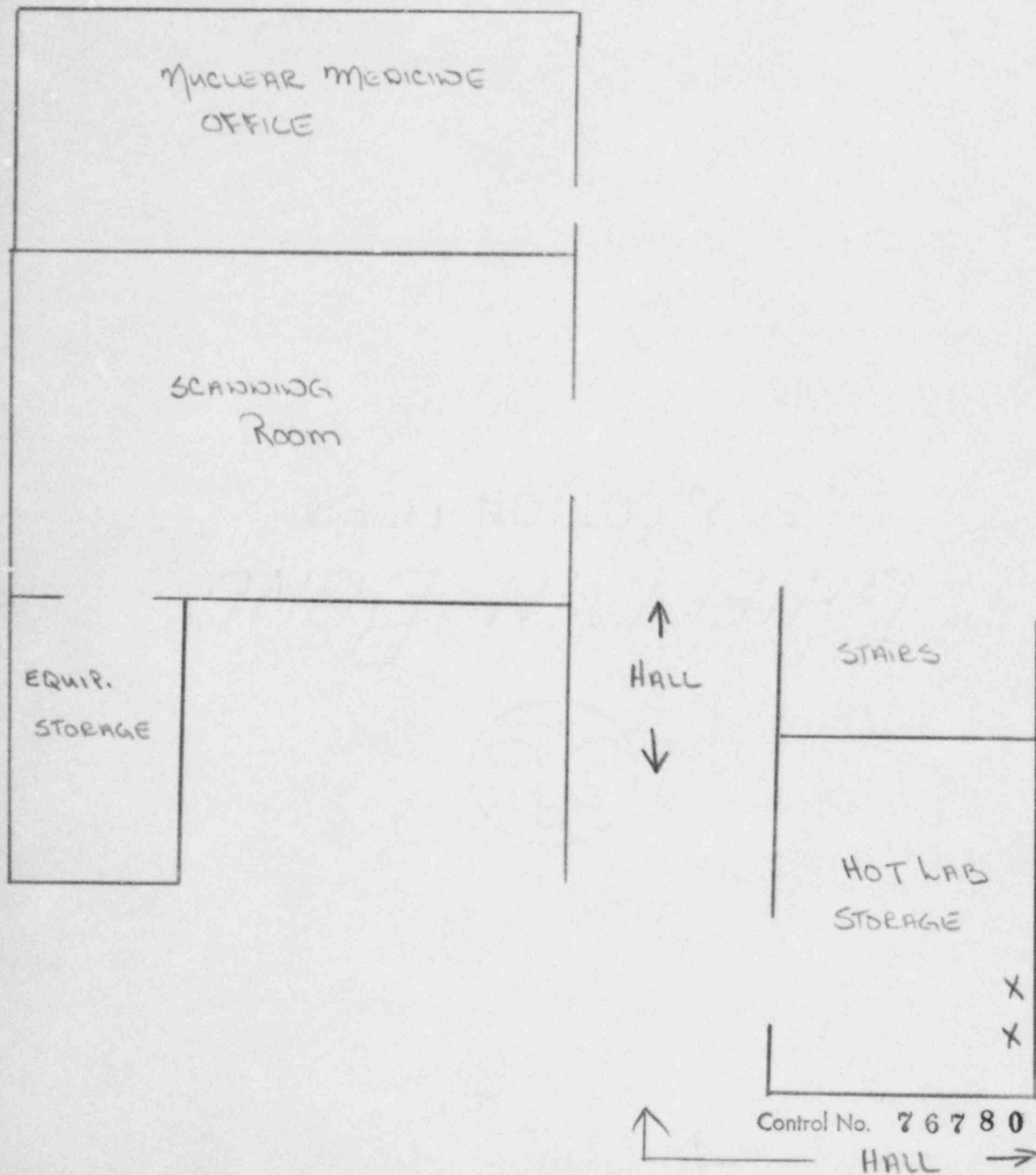
REGION III

MAY 15 1984

Control No. 76780

FLOOR PLAN OF NUCLEAR MEDICINE

X REPRESENT LEAD CONTAINERS USED FOR WASTE. A STEP-DOWN SYSTEM (FIRST TO ONE, THEN THE OTHER, THEN TO TRASH COMPACTOR. STAIRS AND HALLWAY ARE TRAVELED VERY LITTLE.



NUCLEAR MEDICINE LABORATORY
LAWRENCE COUNTY HOSPITAL
IRONTON, OHIO

PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE GASES

1. Quantities to be Used:

- a. 5 patients/week at 10 mCi patient
- b. Possession limit of 500 mCi of Xe-133 as a gas

2. Use and Storage Areas:

- a. Xe-133 will be received as needed in unit dose vials the day of expected use, temporarily stored in storage (hot lab)
- b. Exhaust system with exhaust rate of 10.5 cfm.
- c. Camera Room (Diagnostic) has a room supply rate of 60 cfm and an exhaust rate of 299 cfm (during routine Xenon studies) to outside.
- d. Airflow rates in ventilation system (for storage and diagnostic rooms) for Xenon-133 will be measured semi-annually to determine that system performance meets specifications indicated.

3. Procedure for Routine Use:

- a. The Xe-133 will be delivered to the patient with an appropriate Xenon "Gun" into an enclosed and shielded system (Pulmonex controlled gas delivery system or equivalent) which contains a rebreathing apparatus, CO₂ and H₂O absorbers and a Xenon trap. The patient is connected to the system by means of a short selection of flexible tubing and a mouthpiece using nose clamps). The rebreathing system will be filled with O₂ and connected to the patient prior to injection of the Xenon into the system.

4. Emergency Procedures:

- 1. Make certain that special exhaust system to outside is operational.
- 2. Remove patient and all personnel from area.
- 3. Close door to room and seal bottom of door.
- 4. Notify Radiation Safety Officer.
- 5. Allow exhaust system to operate for at least one hour.
- 6. Open door and monitor close to the floor with Geiger-Mueller Survey Meter as progressing into the room.

Control No. 7 6 7 8 0

5. Air Concentration of Xenon-133 in Restricted Areas:

- a. $A = 5 \text{ patients/week} \times 10 \text{ mCi/patient} = 50 \text{ mCi week}$
- b. $f = 20\% \text{ leakage of Xenon during storage, use and disposal}$

$$c. \quad V = \frac{A \times f}{1 \times 10^{-5} \text{ } \mu\text{Ci}} = \frac{0.5 \times 10^5 \text{ } \mu\text{Ci/week} \times 0.20}{1 \times 10^{-5} \text{ } \mu\text{Ci/ml}}$$

$$= 1.0 \times 10^9 \text{ ml/week}$$

Required ventilation rate is

$$\frac{1.0 \times 10^9 \text{ ml/week}}{40 \text{ hrs/week}} \times 1.7 \times 10^6 \frac{\text{cfm}}{\text{ml/hr}} = 15 \text{ cfm}$$

Room supply rates and exhaust rates as given above for the room are adequate.

6. Air Concentration of Xenon-133 in Unrestricted Areas:

- a. Outside Camera (normal operation):

$$A = 2.5 \times 10^6 \text{ } \mu\text{Ci/year}; \quad f = 20\% \text{ leakage}$$

$$V = 300 \text{ ft}^3/\text{min} \times 1.49 \times 10^{10} \frac{\text{ml/yr}}{\text{ft}^3/\text{min}}$$

$$= 4.47 \times 10^{12} \text{ ml/yr}$$

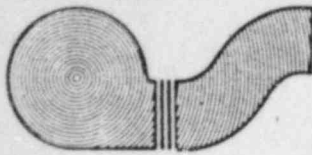
$$C = \frac{A}{V} = \frac{0.5 \times 10^6 \text{ } \mu\text{Ci/yr}}{4.47 \times 10^{12} \text{ ml/yr}}$$

$$= 1.1 \times 10^{-7} \text{ } \mu\text{Ci/ml (Concentration of Xenon in Air in Unrestricted Areas)}$$

Hence, air concentrations averaged over a year in unrestricted areas will not exceed $3 \times 10^{-7} \text{ } \mu\text{Ci/ml}$

- c. Unit dose vials of Xenon-133 will be returned immediately after use to commercial supplier.

Absorption of Xenon-133 onto charcoal traps. Xenon-133 charcoal trap is sampled for efficiency. The sampler uses a 3 liter plastic specimen bottle and one-way valves available from a disposable ventilation kit. The trap exhaust is pumped through the sampler for a few minutes; then the sampler is removed and checked with a GM survey meter (window open) placed against surface of bottle. Calibration is accomplished by using a known amount of Xenon-133 in the specimen bottle and the count rate observed with the detector (window open) placed against the surface of the bottle. After this calibration, the observed count rate observed provides a measure of Xenon-133 concentration in the trap exhaust. Knowledge of the volume of air pumped through the trap per ventilation study combined with the assay of the Xenon-133 concentration allows trapping efficiency to be estimated. This trapping efficiency is compared to a predetermined minimum acceptable value of 95%. The routine quality control procedure is reduced to comparing the observed survey instrument reading to a decision point reading. If trap performance is less than desired, trapping ability of the charcoal is estimated from a knowledge of trapping efficiency, workload, and charcoal bed size.



AIR SYSTEMS

Sheet Metal Company • P. O. Box 9426
111 12th St. W. • Huntington, WV 25704

JOB. NO: LEONTON GENERAL HOSPITAL

2228 SOUTH 9TH

LEONTON, OH 45638

4/4/84

BOB TAYLOR

VENTILATION FOR XE-133

P.O. 0413

EXHAUST FAN:

DIRECT DRIVE WALL EXHAUSTER
POWER LINE BODWFBK OR EQUAL
SPEED CONTROLLER FROM 0 TO
299 CFM @ 4" EA

DIAGNOSTIC
10'-6" x 16'

14x6
60 CFM



MECHANICAL
STORAGE

0-299 CFM

EXHAUST
FAN

NOTE: ALL CEILINGS
8'-6"

HALL

PLAN

STORAGE

6x4

10.5 CFM

ALAN G. HENDLEY
MECHANICAL ENGINEER
OHIO REG E027440

Control No. 76780

INSTRUCTIONS FOR WEEKLY XE-133 TRAP CHECK

TO OBTAIN XE-133 SAMPLE:

1. CONNECT SAMPLER TO TRAP EXHAUST.
2. RUN TRAP ABOUT THREE MINUTES.
3. DISCONNECT SAMPLER.

TO ASSAY XE-133 CONCENTRATION IN SAMPLE:

1. CONFIRM THAT THE SURVEY METER BATTERY READING IS OKAY.
2. OBTAIN SURVEY METER BACKGROUND READING.
3. CONFIRM THAT THE CHECK SOURCE READING IS OKAY.
4. OBTAIN READING WITH THE SURVEY METER AT THE SIDE OF THE SAMPLER.
5. RECORD THE READING (COUNTS PER MINUTE), SUBTRACT THE BACKGROUND AND COMPARE TO THE ACTION-POINT LIMIT.
6. TRAP SERVICE IS INDICATED IF NET COUNTS PER MINUTE EQUALS OR EXCEEDS THE ACTION-POINT LIMIT.

NOTE:

A measurement of airflow is recommended initially and whenever charcoal is replaced. The purposes of the measurement are 1) to verify that the air volume pumped through the charcoal per study is not excessive, and 2) to determine if the trap is sufficiently leak tight that the sampler readings are valid measurements of exhausted Xe-133.

The best way to perform this measurement without special equipment is to record the time required for the trap to empty or fill a plastic bag with a known volume of air or oxygen. A bag containing 15 to 30 liters works well, as the pumping time to empty or fill it is around 3-5 minutes.

SURVEY METER RESPONSE TO ^{133}Xe IN THREE-LITER BOTTLE

General

Hospital:

Meter Make & Model:

Survey Meter Calibration

Date:

Background (cpm):

Internal Check-Source Reading (cpm):

^{133}Xe Source Reading (cpm):

^{133}Xe Concentration ($\mu\text{Ci}/\text{cm}^3$)

Meter Response ($\text{cpm}/(\mu\text{Ci}/\text{cm}^3)$)

Assumption for Action Point Criteria

Trapping Efficiency =

Air Pumped Through Trap =

Activity into Trap/Study =

Meter Response =

Calculation of Action Point ^{133}Xe Concentration

Maximum Acceptable Meter Reading =

$$= (1 - \text{trapping efficiency}) \frac{\text{activity/study}}{\text{air volume/study}} \times \text{meter response}$$

=

=

| Date | ^{133}Xe Bottle Reading | Background Reading | # of Ventilation Studies Since last entry | #mCi ^{133}Xe Administered Since last entry |
|------|-------------------------------------|-----------------------|---|--|
| | | | | |

Control No. 76780

CALIBRATION OF DOSE CALIBRATOR

A. Sources Used for Linearity Test

(Check as appropriate)

☒ First elution from new Mo-99/Tc-99m generator

or

☐ Other* (specify) _____

B. Sources Used for Instrument Accuracy and Constancy Tests

| <u>Radionuclide</u> | <u>Activity (mCi)</u> | <u>Accuracy</u> |
|--|---------------------------|-----------------|
| <input checked="" type="checkbox"/> Co-57 | _____ | _____ |
| Ba-133 | _____ | _____ |
| <input checked="" type="checkbox"/> Cs-137 | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

C. ☒ The procedures described in Section 2 of Appendix D will be used for calibration of the dose calibrator

or

☐ Equivalent procedures are attached.

* Must be equivalent to the highest activity used.

THIS AREA HAS LEAD BRICKS
COMPLETELY AROUND IT.

DOSE PREPARATION AREA

COLLIMATOR TABLE
(2)

GENERATOR
(3)

WASTE
(4)

1/2" STEEL CAN
WITH LEAD
TOP

Tech.

DATE

1. _____
2. _____
3. _____
4. _____

DOSE
CALIBRATION
(1)

INSTRUCTIONS TO WORKERS

A. RADIATION WORKERS

B. ANCILLARY PERSONNEL

RADIATION WORKERS -personnel working in the X-ray department, both technical and non-technical, at least annually at one of the monthly meetings of the Radiology department, are instructed in radiation health. They are instructed in methods to minimize exposure to patients and to themselves. Only those technicians specifically trained to handle radioactive materials do so. It is the responsibility of the personnel to report any conditions which may lead to or cause violations of regulations. All personnel are instructed in procedures in the advent of an unusual risk of exposure or unusual exposures from radioactive material or radiation equipment. These should be brought to the attention of the Radiation Safety Officer. In our institution, Nuclear Medicine department is one floor removed from the X-ray department and two technical personnel and two physicians are involved in its operation. In addition to the general instructions given all personnel as described above, exposure, handling of materials, radiation health, and protection and any change in routine is discussed as needed but at least annually by these. Radiation exposure reports are posted continually in the bulletin board in the X-ray department. Any unusual exposure is discussed by the personnel involved and the Radiation Health Officer.

ANCILLARY PERSONNEL -at least annually, personnel outside of the X-ray department are instructed in the meaning of the signs and precautions to be observed in the Nuclear Medicine and Radiation areas. The storage areas for the radioactive material are made known to the Housekeeping department and they are instructed about the equipment and material in the radiology department. This has been done initially and will be done on an annual basis.

| 24. PERSONNEL MONITORING DEVICES | | | |
|----------------------------------|-----------------|-------------------------|--------------------|
| TYPE (Check appropriate box) | | SUPPLIER | EXCHANGE FREQUENCY |
| a. WHOLE BODY | FILM | | |
| | TLD | Searle Diagnostics Inc. | Monthly |
| | OTHER (Specify) | (NuclibadgeII) | |
| b. FINGER | FILM | | |
| | TLD | Searle Diagnostics Inc. | Monthly |
| | 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

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

MAILING ADDRESS

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

CITY

STATE

ZIP CODE

26. CERTIFICATE

(This item must be completed by applicant)

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

b. APPLICANT OR CERTIFYING OFFICIAL (Signature)

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

(1) NAME (Type of Print)
Byron E. Boothe

(1) LICENSE FEE CATEGORY:

(2) TITLE
Administrator

(2) LICENSE FEE ENCLOSED: \$

c. DATE
2/14/80

LAWRENCE COUNTY GENERAL HOSPITAL

A Community Organization Operated for the Benefit of Its Patients

2228 SOUTH 9th — HOSPITAL SQUARE PHONE 532-3231
IRONTON, OHIO 45638

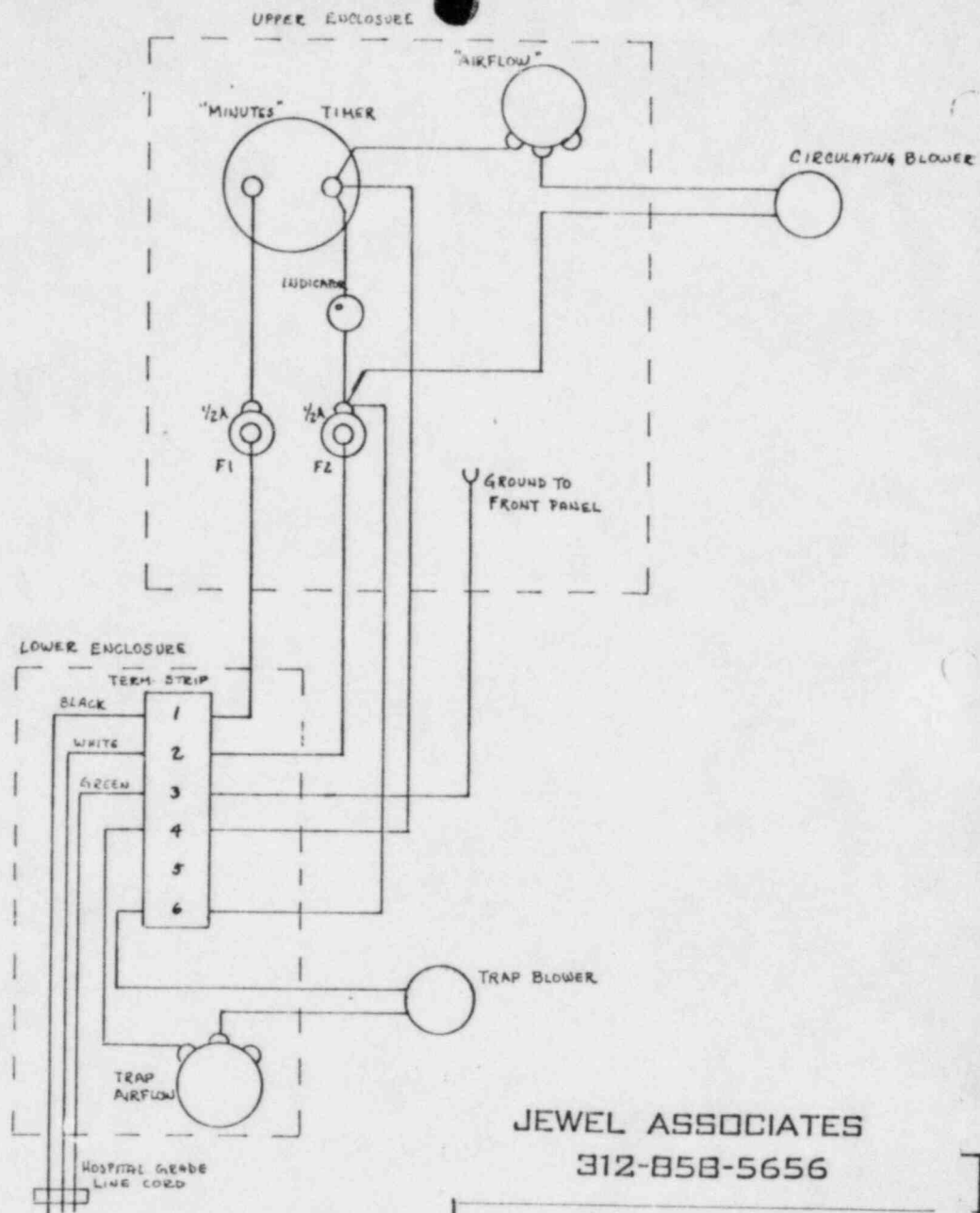
March 13, 1980

Gentlemen:

Byron Booth, Hospital Administrator has ~~been~~ accepted membership
into the Medical Isotope Committee.

Sincerely,

Robert O. Taylor, R. T.
Chief Radiologist Technologist



JEWEL ASSOCIATES
312-858-5656

PULMONEX WIRING DIAGRAM

| | | |
|--------|--------------|----------|
| MAT. | | A090-419 |
| DR. 4C | DATE 3-18-78 | |
| FINISH | SCALE | |

© JEWEL ASSOCIATES INC. PULMONEX WIRING BY

17. When the patient reaches equilibrium (1 or 2 minutes, the counting rate on the camera stabilizes), switch to "Washout, #3". Take washout data on the camera (typical framing: first picture, 15 seconds; second, 30 seconds; third, 60 seconds). Have the patient breathe normally slowly.
18. Carefully watch the "from patient" bag. If it starts blowing up, the patient is breathing too fast. Advise him to normalize his breathing and increase the "Air Flow" speed. If the bag continues to expand up towards the glass, the patient will feel back pressure and resistance. To relieve this effect, open the lower cabinet. In the center there is a motor control. Turn it clockwise until the breathing bag deflates. Return the control to about 1/2 of its range when the study is complete. The use of this motor control will be a rare occurrence. Do not adjust it unless it is absolutely necessary. If it is used, be sure to return it to its original position. To be effective, the increase in motor speed must be done before the bag is full so watch the "From Patient" bag carefully during washout.
19. When the washout is complete, remove the patient and let the system run for a few more seconds or until both bags are empty.

To prolong the life expectancy of your charcoal cartridge, do the following:

1. When the patient has completed the washout, do not leave the system running for more than 10 seconds.
2. Check the lower blower motor. It should be set on 50-60 and not increased unless a specific patient needs the extra evacuation power.
3. Make sure the drierite is replaced before it changes color.
4. Do not leave the Pulmonex in Position #3 when not in use.
5. Monitor the trap effluent at regular intervals and keep a formal record.
6. Spread studies out. If you perform all your studies in one day, xenon may break through.

Additional routine for maintenance program:

1. Remove the two breathing tubes on the back of the unit. Take one short tube about 8" and connect the two ports on the back of the unit together so that there is a C configuration made by the single tube. Place the handle in position #2 and press the oxygen button filling the unit with oxygen. Both bags should be blown up tight against the glass windows. They should remain tight for about two minutes. If they do not blow up tight or sag, you may have a leak somewhere in the system. Call us if this happens.
2. On the front panel, the handle has a silver disk located in the center. Pry up the disk using a fingernail, knife or scalpel. Underneath the disk you will see that the top of the master valve stem has a small black line painted from the center outward to the edge of the valve stem. Turn the handle from position #1 to position #2 and then to position #3. As the handle turns, the black mark will turn along with the handle and point to the same position that the handle points to. If the black mark and the handle point to different positions, call us.

TEST PROCEDURE FOR MONITORING TRAP EXHAUST

Trap exhaust is monitored by using the gamma camera without a collimator. The following simple technique is used:

1. Remove the collimator from the camera.
2. With a 5 percent window, calibrate for Xe-133.
3. Fill a large plastic bag with a known volume of air (typically, 50 liters).
4. Inject a known quantity of Xe-133 (such as 100uCi) into the bag. The concentration will be 2×10^{-3} uCi/cm³.
5. Place the bag in front of the crystal and count for a known period of time. The c/m obtained is a measure of the efficiency.
6. Collect the exhaust of a typical study in another bag of the same volume (50 liters) and count as defined in Step #5.
7. Ratio the count rates to the standard taken to determine exhaust concentration.

For example:

If 2×10^{-3} uCi/cm³ yielded 600,000 c/m above background, and collected effluent from the patient study was 150 c/m above background, then:

$$\text{Ratio} = \frac{1.5 \times 10^2 \text{ c/m}}{6 \times 10^5} = 2.5 \times 10^{-4}$$

Exhaust Concentration

$$\begin{aligned} &= R (2 \times 10^{-3} \text{ uCi/cm}^3) \\ &= (2.5 \times 10^{-4}) (2 \times 10^{-3}) \\ &= 5 \times 10^{-7} \text{ uCi/cm}^3 \end{aligned}$$

*MPC Xe-133 controlled area should not exceed 1×10^{-5} uCi/cm³.

Only perform the trap test when a patient is being tested on the system.