North Detroit General Hospital
3105 Carpenter Avenue
Detroit, Michigan 48212

030-12467

April 2, 1984

United States Nuclear Regulatory Commission
Region III, Office of Materials Licensing
799 Roosevelt Road
Glen Ellyn, Illinois 60137

ATTENTION: Bruce Mallett, Ph.D.

RE: Request for amendment to NRC License No. 21-10578-02.

We hereby request the following change to our NRC License.

1. Change in location of our Nuclear Medicine Department. Item 11 provides a diagram of the location. Item 21 (included) provides pertinent information for Xe-133 use. A decontamination survey of the old facility will be provided when the move is complete.

Thank you for your help and attention regarding this matter. Enclosed is the $40.00 fee for the License amendment per 10 CFR 170.31 7.B.

Sincerely,

Marie M. Sitka, Administrator

Administration
North Detroit General Hospital

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APPENDIX M

INFORMATION IN SUPPORT OF XE-133 USE

1. QUANTITIES TO BE USED

A. Patient information

(1). 10 studies per week
(2). 10 milliCuries (average) per study

B. 200 milliCuries possession limit

2. USE AND STORAGE APEAS

A. Xenon-133 will be stored in the Storage Area of the Hot Lab and used (i.e., administration, imaging, and trapping/exhaust) in the Imaging Area.

B. Ventilation: A(n) 840 CFM exhaust (LFOV Room) and/or 753 CFM exhaust (MOBILE Room) deliver(s) air directly to OUTSIDE air on the facility roof, carrying a major portion of any Xe-133 contamination, and is (are) situated well away from any intake vents (30 feet minimum). Doors to the HOT LAB will be left open to facilitate exhausting. Airflow will therefore come from the hallway via the door(s). No air is recirculated.

C. In the case of exhaust fan shutdown, Xe-133 studies will not be performed.

3. PROCEDURES FOR ROUTINE USE

A. When stored in the Hot Lab, Xe-133 is contained in unit dose ampules inside 1/8" lead shipping tubes behind lead bricks. Individual doses will be assayed in the dose calibrator and admininstered using the NEN Calidose Gas Dispensing System. The seal will be broken only in the Imaging Area. Thus, no significant leakage is expected in the Hot Lab Area.

B. Xe-133 will be administered to the patient and collected using the Nuclear Associates XDS (Xenon Trap System) Model 36-103, and the Nuclear Associates "Nonex" Xe-133 Gas Trap, Model 36-022. For each patient study, the technologist will check the tubing of the xenon delivery system for defects and will familiarize the patient with the study.

C. Nose clamps will be used to reduce leakage.

4. EMERGENCY PROCEDURES

A. Notify persons in the room that a release has occurred.

B. All persons should vacate the room at once.

C. Close the room door(s) to prevent entry.

D. Notify the Radiation Safety Officer immediately.

E. Re-enter the room(s) after 15 minutes (5 turnovers of room air).

F. Perform an exposure rate survey with a GM survey meter.

5. AIR CONCENTRATIONS OF XE-133 IN RESTRICTED AREAS

A. Activity used (A) = 10 mCi x 10 exams/wk x 1E3 uCi/mCi
= 1.0E5 uCi/wk

B. Loss rate (f) = 0.20

C. Ventilation required (V) = (A x f) / (1E-5 uCi/ml)

$$= \frac{1.0E5 \text{ uCi/wk} \times 0.20}{1E\text{-}5 \text{ uCi/ml}}$$

= 2.0E9 ml/wk

Assuming a 40-hour week:

$$V = \frac{(2.0E9 \text{ ml/wk}) / (40 \text{ h/wk})}{1.7E6 \text{ ml/h-CFM}}$$

= 29.4 CFM

Thus, the airflow in the area of interest, 840 CFM exhaust (LFOV Room) and/or 753 CFM exhaust (MOBILE Room), is adequate.

6. AIR CONCENTRATIONS OF XE-133 IN UNRESTRICTED AREAS

A. Charcoal-trap adsorption (Reg. Guide 10.8, Appendix M, 6.b) via the Nuclear Associates XDS (Xenon Trap System) Model 36-103, and the Nuclear Associates "Nonex" Xe-133 Gas Trap, Model 36-022.

B. Ventilation required (V) = $\frac{(1.0E5 \text{ uCi/wk}) / 0.20}{3E\text{-}7 \text{ uCi/ml}}$

= 6.67E10 ml/wk

Assuming a 168-hour week:

$$V = \frac{(6.67E10\ ml/week)\ /\ (168\ h\text{-}wk)}{1.7E6 ml/h\text{-}CFM}$$

$$= 233.4\ CFM$$

Thus, 840 CFM exhaust (LFOV Room) and/or 753 CFM exhaust (MOBILE Room) is adequate. Duct(s) on-time will be approximated from the following equation and recorded:

$$\text{Duct(s) On-Time} = \frac{(n/10) \times 168h \times 233.4\ CFM}{840\ CFM\ exhaust\ (LFOV\ Room)\ and/or\ 753\ CFM\ exhaust\ (MOBILE\ Room)}$$

where:
n = number of 10 mCi-equivalent patient studies

C. Trap monitoring

(1) Effluent from the trap exhaust will be collected in a test balloon weekly and counted on a Gamma Camera with the collimator removed and the PHA set for Xe-133. The procedure for xenon trap evaluation is included. Care will be taken to assure that no extraneous radiation sources interfere with the measurements. Given a 10 mCi dose and assuming a 95% trapping efficiency and no residual Xe-133, a 500 uCi action level for trap removal is deemed reasonable. However, experience dictates that effluent is significantly less than 500 uCi in properly operating systems. Thus, an action level of 200 uCi will be set, which is a small fraction of the assumed 20% leakage from all sources.

(2) Saturated filters will be sealed (per manufacturer's instructions) to prevent leakage. These will be then stored in the "Decay-to-Background" Radioactive Waste Storage Area or returned to the supplier.

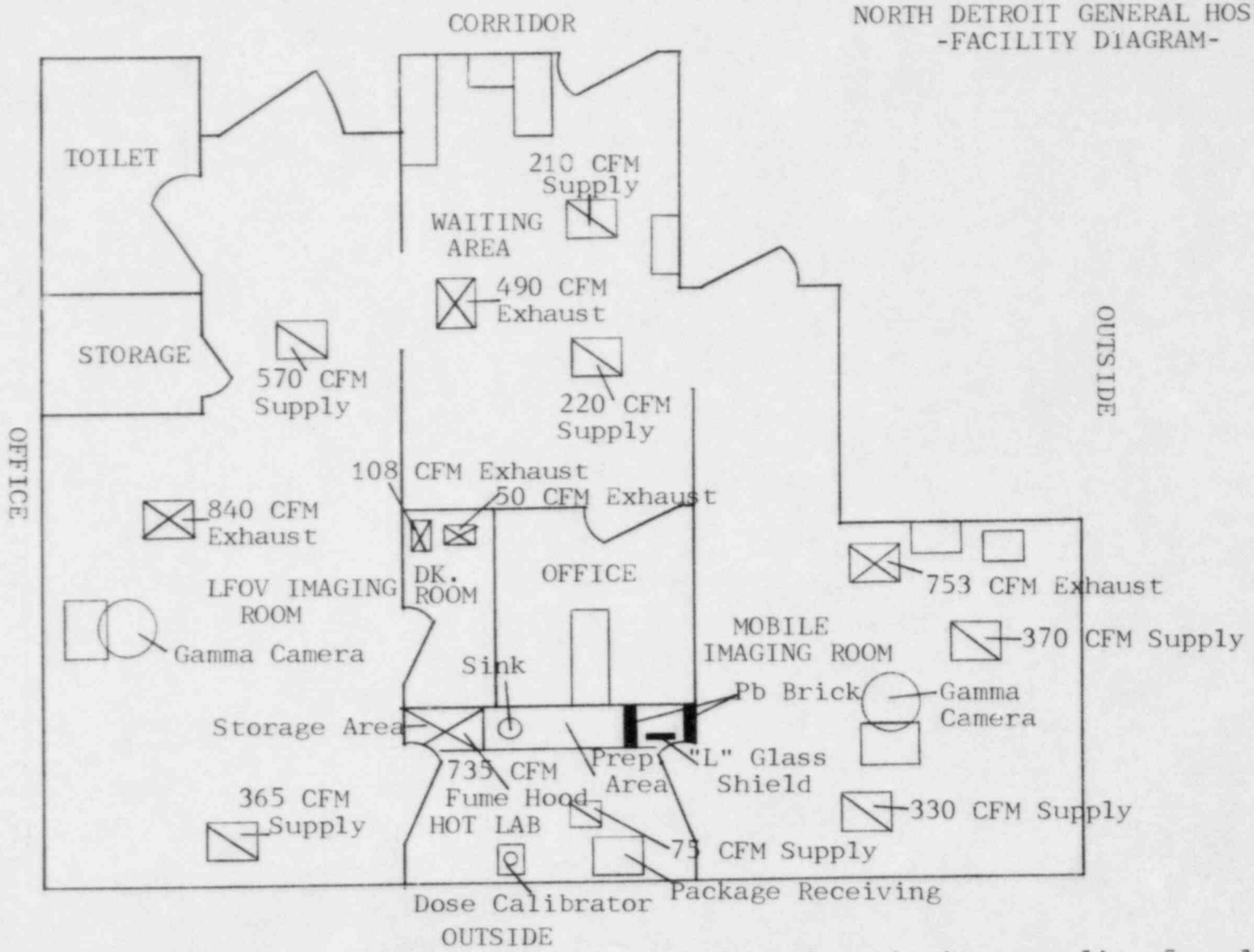
(3) An optional method for checking effluent from the trap exhaust will be used if a XenAlert Xe-133 Room Air and Trap Monitor System is purchased. This device will be used weekly and will be calibrated annually as outlined in the manual provided with each unit. A similar action level (mentioned above) will be used.

(4) Velometer readings will be taken semi-annually to assure air flow through supply and exhausts systems have remained stable.

ITEM 11

NORTH DETROIT GENERAL HOSPITAL
-FACILITY DIAGRAM-

Control No. 76682




NOTE: At present, all radiopharmaceuticals will be returned to the unit dose supplier for ultimate disposal by them. I-131 liquid for treatment of hyperthyroidism and carcinoma is ordered and used only as needed. If in the future, unit doses are not returned or a Tc-99m/Mo-99 generator is used, a waste area will be identified, properly labeled, and materials will be decayed to background & disposed of properly after survey.