

631 Hazel Street
Post Office Box 1100



Oshkosh, WI 54902
(414) 236 2000

July 24, 1985

Patricia J. Whiston, Materials Licensing Section
United States Nuclear Regulatory Commission
Region 3
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Ms. Whiston:

The following is in response to the six items requested to complete our amendment request to add Xenon 133 to our biproduct materials license number 48-07957-01.

1. The camera room does appear to be under a positive pressure with a 575cfm of supply air and a 445cfm exhaust. However, as stated in the previous information, when performing xenon ventilation studies a switch is activated to close a damper which shuts off the supply air. This allows the exhaust to continue to operate. So consequently during that time of a xenon procedure the supply air is essentially zero with the exhaust air of 445cfm.
2. Exhaust air from the camera room is not recirculated but is exhausted through its separate vent and exhaust stack through the roof.
3. The exhaust stack is three feet above the canopy of the roof, and is three feet from windows which are sealed closed. The exhaust stack is also 20 feet above and 30 feet from the nearest air intake.
4. Measurements of the ventilation rates in areas where xenon is used and stored are monitored on a semiannual basis to ensure that the system is operating properly.
5. Calculations for the xenon released to unrestricted areas is included.
6. Following an accidental release of xenon 133 gas and before personnel are permitted to reenter the imaging area a confirmatory survey is performed to ensure that radiation levels have reached background.

When continuing review of our application, please refer to control number 78788.

Sincerely,

Thomas Grunwald
Technical Director Medical Imaging

TG/cp
Enc. (1)

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REGION III

Sisters of the Sorrowful Mother

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Xenon Released to Unrestricted Areas

- (1) Xenon 133 exhausted to the atmosphere - contribution (f) from:

Isotope Preparation Laboratory

$$f = 250 \text{ uCi/wk.} \times 52 \text{ wk.} = 1.3 \times 10^4 \text{ uCi/yr.}$$

Camera Room

$$f = 1500 \text{ uCi/wk.} \times 52 \text{ wk.} = 7.8 \times 10^4 \text{ uCi/yr.}$$

Total contribution (f):

$$f_t = 1.3 \times 10^4 \text{ uCi/yr.} + 7.8 \times 10^4 \text{ uCi/yr.} = 9.1 \times 10^4 \text{ uCi/yr.}$$

- (2) Air Flow exhaust rate (Isotope Prep Lab. + Camera Room) $V_t = 560 \text{ ft}^3/\text{min.}$

$$V_t = 560 \text{ ft.}^3/\text{min.} \times 2.832 \times 10^4 \text{ ml/ft}^3 \times 60 \text{ min./hr.} \times 24 \text{ hr/day} \times 365 \text{ day/yr.} = 8.34 \times 10^{12}$$

- (3) Average Concentration (C) : $C = \frac{f_t}{V_t} = \frac{9.1 \times 10^4 \text{ uCi/yr.}}{8.34 \times 10^{12} \text{ uCi/yr.}} = 1.09 \times 10^{-8} \text{ uCi/ml.}$