RADIOPHARMACY
OF INDIANAPOLIS

February 4, 2015

US Nuclear Regulatory Commission
Region III
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352

Subject: License Amendment

Dear Sir:

Please amend our NRC license #13-32637-01 MD to include the following changes.

1. Please increase the Xe-133 possession limit from 800 mCi to 1100 mCi. Xenon 133 gas will continue to be purchased as unit dose vials and dispensed as such. There will be no manipulations of the contents of the vial between receipt and dispensing. The estimated fraction of Xe-133 lost during storage is 0.5 % per day from its unit dose vial. (See Attached)

   In support of the possession limit increase, we also request that our airflow exhaust rate be increased from "no less than 200 cubic feet per minute (3.4×10^8 ml/hr)" to "no less than 275 cubic feet per minute (4.675×10^8 ml/hr)". The last two independently determined velometer readings demonstrated readings in excess of 290 cfm.

   The estimation of the concentration of Xenon-133 in the effluent to unrestricted areas is:

   Possession limit if Xenon-133 = 1100 mCi

   C = $< 5.0 \times 10^{-7}$ uCi/ml of Xenon-133 released to unrestricted areas.

   A= estimated maximum uCi Xenon-133 released per week
   = 1,100,000 uCi X 0.5%/day X 7 days/week = 38,500 uCi/week

   V= (4.675×10^8 ml/hr) X 168 hrs/week = 7.85×10^{10} ml/wk.

   C = A/V = (38,500 uCi/week) / (7.85×10^{10} ml/week) = 4.9×10^{-7} uCi/ml

Thank you for your attention in this matter. Should you have any questions concerning this request do not hesitate to contact me.

Sincerely,

Brian Hardesty

Brian Hardesty
Radiation Safety Officer

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Corporate Center North II, Building A • 6538 Corporate Drive • Indianapolis, IN 46278 • OFFICE 317-347-0102

RADIOACTIVE MATERIALS LICENSE APPLICATION

Item 9 – FACILITIES AND EQUIPMENT

Precautionary Measures for Handling Radioactive Gases

A) Quantities to be Received and Dispensed.

Unit dose vials of Xenon-133 will be acquired from licensed suppliers. When the nuclear pharmacy receives shipments of Xenon-133, the gas will be in sealed glass vials, which will be shipped to authorized users without being opened or without the septum being punctured or without the contents being altered in any way. These vials will be shipped from the nuclear pharmacy in the manufacturer supplied shielded containers in which they were received.

B) Storage.

The sealed vials will be stored in the radioiodine hood, or otherwise under negative pressure within the I-131 room, and will remain inside the original lead containers used by the manufacturer for shipment until such time the product is dispensed to a customer.

C) Procedures for Routine Use.

Xenon-133 will only be stored as inventory and will not be used in the nuclear pharmacy. When an authorized user orders a quantity of Xenon-133 gas, the vials will be dispensed in their manufacturer supplied shielding.

D) Air Concentrations.

The airflow at the opening of the radioiodine hood will remain above 50 feet per minute (fpm) via the hood's continuous operation. Exhaust is no less than 200 cubic feet per minute (3.4×10^8 ml/hr). The exhaust rate will be checked semi-annually with a velometer, or an equivalent means, to verify the exhaust system operability.

Assuming an estimated fraction of Xenon-133 lost during storage to be 0.5% per day from its unit dose vial, the estimation of the concentration of Xenon-133 in the effluent to unrestricted areas is:

A = Estimated Maximum Xenon-133 Released Per Week (uCi)

= 800,000 uCi x 0.5% x 7 days = 28,000 uCi/week

$V = (3.4 \times 10^8) \times 168$ hr/week $= 5.7 \times 10^{10}$ ml/week

$C = (28{,}000$ uCi/week) / $(5.7 \times 10^{10}$ ml/week) $= 4.9 \times 10^{-7}$ uCi/ml

RADIOPHARMACY
OF INDIANAPOLIS

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Indianapolis, IN 46278

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