



Pharmaco nuclear inc.

100 NORTH EUCLID AVENUE • SUITE 900

ST. LOUIS, MISSOURI 63108

(314) 367-9300

October 21, 1980

Mr. Joseph Del Medico
Materials Licensing Branch
Division of Fuel Cycle and Material Safety
United States Nuclear Regulatory Commission
Washington, DC 20555

Mr. Del Medico:

RECEIVED BY LFMR

Date: OCT 29 1980

Log: Oct: Pg. 30 / Amend

By: Brown

Eng. To: 10/30/80

Action Compl: 10/30/80

We request the following amendments to our license No. 24-19360-01MD.

1. Under condition 12A we wish to add the name of John W. Jarvis as a user. Mr Jarvis has previously been listed as a user on the following NRC licenses.
 1. Mallinckrodt Inc. -24-04206-01
 2. Nuclear Medicine Assoc. Inc. - 34-16272-01A copy of his Curriculum Vitae is enclosed.
2. Under condition No. 12A change William H. McHugh, Ph.D. to William C. McHugh, Ph.D.
3. Increase our possession limit for 133-Xenon from 1.0 curie to 2 curies. In order to justify a possession limit of 2 curies the following information is submitted.

The material will not be used at the pharmacy, only stored until such time that it can be assayed and dispensed to our customers. We have installed two fume hoods in the area where 133-Xenon will be dispensed. These fume hoods have been designated Fume Hood A and Fume Hood B. Both fume hoods have their own ventilation ducts and are vented 10 feet above the building in which the pharmacy is located. The motors and blowers for these units are located on the roof and it is a minimum of 25 feet to the nearest window and well over 100 feet to any air intake vents into the building. Following is the ventilation information for the dispensing and storage area for 133-Xenon.

- a. Supply - 676 CFM
- b. Return - 0
- c. Fume Hood A - 950 CFM
- d. Fume Hood B - 930 CFM
- e. See enclosed sketch for location of supply vents and fume hoods.
- f. See enclosed fume hood test report.

I. Air concentration of 133-Xenon in restricted area.

- a. Fume Hood B will be used for the following calculations. Fume Hood A will be used as a back-up system in case of an emergency.

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INSPECTION

PITTSBURGH • CLEVELAND • KANSAS CITY • ST. LOUIS

B2

05668

B2 hold

8011140364

- b. New England Nuclear has provided us with a letter stating that their 133-Xenon vials average less than 0.5% leakage per day.
- c. If we assume that we will be storing 2.0 curies in the radiopharmacy, 7 days a week, 24 hours a day, then:

$$2.0 \text{ curies/day} \times 0.005 \times 7 \text{ days/week} = 70 \text{ mCi/week}$$

$$V = \frac{A \times F}{1 \times 10^5} \text{ uCi/ml}$$

$$\frac{7.0 \times 10^4 \text{ uCi/week}}{1.0 \times 10^{-5} \text{ uCi/ml}} = 7.0 \times 10^9 \text{ ml/week}$$

$$\frac{7.0 \times 10^9 \text{ ml/week} \times 1 \text{ ft}^3}{40 \text{ hrs/wk} \times 1.7 \times 10^6 \text{ ml/hr}} = 103 \text{ CFM}$$

The ventilation rate in this area is 689 CFM supply and 930 CFM exhaust with a negative pressure of (930 - 689) = 241 CFM and with no air recirculation to any other area of the building.

There will never be a time that our total possession limit will be on hand for longer than a few hours per day since the bulk of the material we dispense is received and shipped the same day to our standing order customers.

II. Method of 133-Xenon Disposal:

- a. 133-Xenon will be purchased in unit dose vials. This material will be assayed and dispensed to our customers in the original vial.
- b. 133-Xenon vials not marketed to hospitals will be held for decay, and will be disposed of in the normal trash when monitoring with a low level survey meter shows the vials to be at background radiation levels.

III. Estimates of concentration of 133-Xenon in effluents to unrestricted areas:

$$a. C = \frac{A}{V} \leq 3 \times 10^{-7} \text{ uCi/ml}$$

$$A = 70 \text{ mCi/wk} \times 10^3 \text{ uCi/mCi} \times 52 \text{ wk/yr}$$

$$A = 3.64 \times 10^6 \text{ uCi/yr}$$

$$V = 950 \text{ ft}^3/\text{min} \times 1.49 \times 10^{10} \frac{\text{ml/yr}}{\text{ft}^3/\text{min}}$$

$$V = 1.42 \times 10^{13} \text{ ml/yr}$$

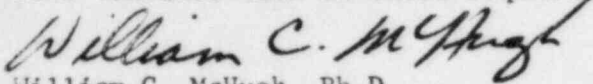
$$C = \frac{3.64 \times 10^6 \text{ uCi/yr}}{1.42 \times 10^{13} \text{ ml/yr}}$$

$$C = 2.56 \times 10^{-7} \text{ uCi/ml}$$

These calculations are based on absolutely maximum conditions which rarely, if ever will be the case. The area where 133-Xenon is handled is 28 feet from the nearest unrestricted area in the pharmacy.

IV. Quarterly inspections and reports of air-flow will be maintained in accordance with condition No. 22 of our license.

Your consideration of these requests is appreciated.



William C. McHugh, Ph.D.
Manager

License Fee Category 3B
Amendment Fee Enclosed \$40.00

Enclosures

CURRICULUM VITAE

JOHN W. JARVIS

ADDRESS:

S.S.NO:

EDUCATION:

	SCHOOL	YEAR GRADUATED
HIGH SCHOOL	COLLEGE HIGH SCHOOL BARTLESVILLE, OKLA	1957
COLLEGE (Undergraduate)	UNIVERSITY OF KANSAS B.S. Radiation Biophysics	1963
COLLEGE (Graduate)	UNIVERSITY M.S. Radiation Biophysics	1971

THESIS: THE INACTIVATION OF UREASE BY IONIZING AND NON-IONIZING RADIATION

ACADEMIC EXPERIENCE:

1961-1962	Health Physics Assistant University of Kansas
1962-1963	Research Assistant University of Kansas

PROFESSIONAL EXPERIENCE:

1964-1966	Medical Physicist Research Hospital Kansas City, Mo.
1966-1977	Mallinckrodt, Inc. 1966-1968 Consulting Physicist 1968-1970 Manager, Physics Consulting 1970-1974 New Ventures Analyst
1977-1979 Nov. 1979 - Aug. 1980	Private Business Consulting Physicist Nuclear Medicine Assoc. Cleveland, Ohio
Aug. 1980-Present	Consulting Physicist Pharmaco Nuclear St. Louis, Missouri

PREVIOUS LICENSES:

Mallinckrodt, Inc.

Member of Radiation Safety Commission
1975-1977

Nuclear Medicine Assoc. Application as licensed user submitted November, 1979.

PROFESSION AFFILIATIONS:

Society of Nuclear Medicine
American Association of Physicist in Medicine



EXHAUST FANS TEST REPORT

PROJECT PHARMACC NUCLEAR INC.

FAN DATA	FAN NO. 1		FAN NO. 2		FAN NO.	
Location	Roof		Roof			
Service	Existing Hood (A)		New Hood (B)			
Manufacturer	Brundage		Brundage			
Model Number	SW-13		SW-13			
Serial Number	---		---			
Class	---		---			
Motor Make/Frame	Westinghouse		Westinghouse			
Motor H.P./RPM	1/3 1750		1/3 1750			
Volts/Phase/Hertz	115/3/60		115/3/60			
F.L. Amps/S.F.	---		---			
Motor Sheave Make	---		---			
Motor Sheave Diam./Bore	---		---			
Fan Sheave Make	---		---			
Fan Sheave Diam./Bore	---		---			
No. Belts/Make/Size	---		---			
Sheave ϕ Distance	---		---			
TEST DATA	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
CFM	900	950	900	930		
Fan RPM	848	850	848	820		
Total S.P.	1.0"W.G.	--	1.0"W.G.	-		
Voltage $\frac{T_1 T_2}{T_3 T_1}$	---	---	---	---		
Amperage $T_1 T_2 T_3$	5.9	5.0	5.9	5.0		

REMARKS: Face Area
Sq. Ft.

F.P.M.

C.F.M.

Exist. Hood 4.17

230

950

New Hood 3.38

275

930

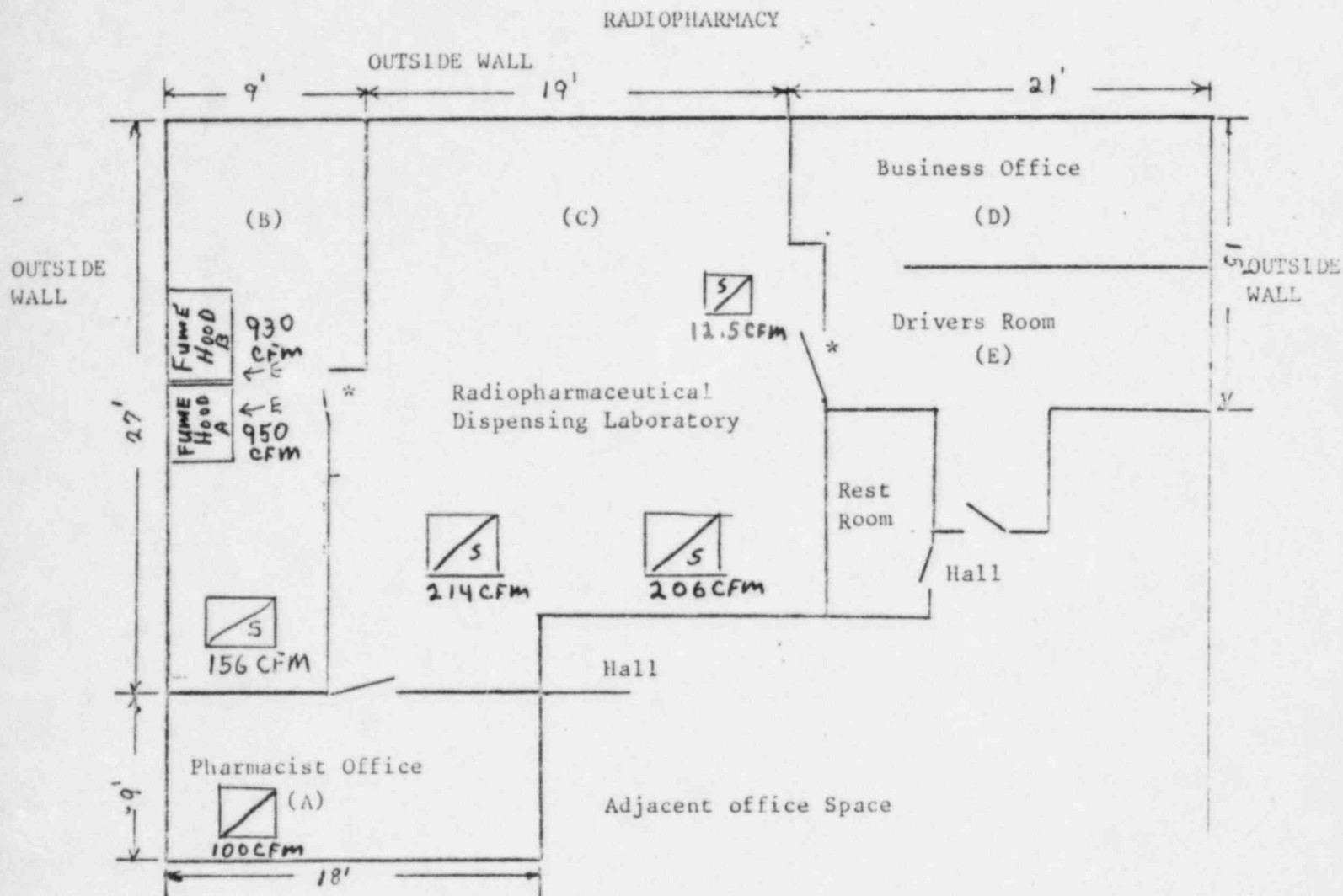
Note:
Face Area \times F.P.M. = CFM



TEST DATE SEPT. 25, 1984 READINGS BY Ray Grossman

NATIONAL ENVIRONMENTAL BALANCING BUREAU

REPORT NOT VALID UNLESS STAMPED WITH
NEBB CURRENT CERTIFICATION SEAL



* Dead Bolt Locks

Total area approximately 1300 square feet
 Located on the ninth floor of a free standing building

Scale 1/8" = 1'

05000