Greenville Hospital / 1825 Kennedy Boulevard / Jersey City, N.J. 07305 / (201) 547-6100

December 8, 1990

Nuclear Regulatory Commission
Region 1
475 Allandale Road
King of Prussia, Pennsylvania 19406

License No. 29-14659-01
Docket No. 030-08198
Ref: Routine inspection No 030-08198/90-001

Dear Sirs:

With regard to the above inspection and your letter dated November 19, 1990, we would like to inform you of the following:

A.1. John Cholankeril, M.D. has been appointed the Radiation Safety Officer. Dr. Cholangeril is the Director of the Nuclear Medicine Department and is presently an authorized user under License No.29-01663-01.

Dr. Colankeril has emphasized the requirements of Appendix G, NRC Regulatory Guide 10.8, Revision 1, to the Nuclear Medicine technologists, and has instructed them to wear gloves at all times while handling radioactive materials.

A.2. It was an oversight on our part not to provide radiation monitoring devices to technologists working on per a diem basis. Spare Body and Figer film badges are now available to the part time technologists. The film badge records will indicate the technologist's name and Social Security Number.

B. Daily constancy checks of dose calibrator are being done at the beginning of each day. Cesium-137 standard is used this test and responses of frequently used isotope channel settings are checked every day.

C. A cesium-137 check source has been purchased and the responce of survey meter to this source is checked on each day of use.

D. The records of radiopharmaceutical dosage measurements now indicate the time of measurement.

E. A record keeping form showing the floor plan of the Nuclear Medicine facility was developed. The form shows each area surveyed, and initials of person performing such survey.

F. The Nuclear Medicine technologist is now instructed to perform surveys of areas where radiopharmaceuticals are routinely prepared and/or administered at the end of each work day.

G. We are enclosing calculations indicating the amount of time needed to reduce spilled radioactive gases to concentrations below limits listed in 10 CFR, Appendix B, Table 1. The calculated time has been posted in the camera room.

Emergency Procedures in case of a spill, have been also posted in the camera room.

H. The operation of the radioactive gas collection system is now checked every month. Each time a procedure is performed, all connections and tubings are checked for leakage and blockage. The ventilation rates have been checked, and they will be checked again in intervals not to exceed six months.

In addition, we would like to inform you that the Radiation Safety Committee (see enclosed membership) met on October 12, 1990, and on December 5, 1990, to discuss the above violations and propose corrective measures.

Sincerely,

Jean Murray

Jean Murray
Vice President, Patient Services.

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RADIATION SAFETY COMMITTEE

John V. Cholankeril, M.D.	Radiation Safety Officer
Jean Murray	Vice President-Patient Services
R. Whaley	Chief Technologist Nuclear Medicine
George Zacharopoulos	Radiological Physicist Deputy RSO
E. Dietrich	Director, Patient Care Services
V. Sloyan	Director of Nursing
I. Ahmad, M.D.	Director of Pathology
P.V. Sastry, M.D.	Director of Cardiology

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October 24, 1990

Greenville Hospital
1825 Kennedy Boulevard
Jersey City, N.J 07305

J. Murray
Administrative Representative

Subject: Report of Ventinting requirements in the Nuclear Medicine Department - Gamma Camera Room.

Doses Administered:

20 millicuries of Xenon-133 in gaseous form or in solution for lung studies.

On the average, there will be about 5 studies per week (total of 100 millicuries per week).

ASSUMPTIONS:

1. All Xenon Studies will be done in the Gamma Camera Room which is about 2300 cubic feet in volume..
   The Doses will be delivered, stored and used only in this room

   This total exhaust will be separately vented through a stack at least 7 feet above the highest point at the roof. The exhaust fan will run continuously for 168 hours per week.

2. It is assumed that there can be as mush as 20% of Xenon-133 gas leakage stored in the Camera Room.

3. It is assumed that a total of 20 millicuries dose of Xenon-133 could be accidentally released in the Gamma Camera Rooms where Xenon studies will be performed.

4. Calculations of Xenon-133 consentrations in restricted and unrestricted areas are carried out for accidental release only. There will be no perposeful release of Xenon activity. All purposful disposal will be through a Xenon trap system which will be capable of removing all Xenon gas which is introduced into it.

5. The MAXIMUM PERMISSIBLE CONSENTRATION (MPC) of Xenon-133 gas in a restricted area is $1x10^{-5}$ microcuries per milliliter of air determined for a period of 168 hours in 7 consecutive days This MPC will pertain to the entire Nuclear Medicine Dept..

6. The MPC of Xenon-133 gas in an unristricted area is $3x10^{-7}$ microcuries per milliliter of air averaged over a time period not grater than a year.

VENTING CALCULATIONS FOR THE GAMMA CAMERA ROOM:

Accidental Release of a 20 mCi Dose of Xenon in Camera Room.

It is assumed that a 20 mCi dose of Xenon-133 may accidentally be released in the Gamma Camera Room. With a room volume of 2300 cf, the static concentration of Xenon-133, assuming complete mixing will be:

20 x 1000 uCi / 2300 cf x $2.8x10^{4}$ ml/cf = $3x10^{-4}$ uCi/ml

To bring this down to MPC of $1x10^{-5}$ uCi/ml, will require 31 room air changes which will occur in 119 minutes, assuming an exhaust flow of 600 cfm through the separate exhaust system. It will be resonable to assume that most of the Xenon-133 activity will be removed during the first 10 room air changes which will occure in 38.4 minutes.

AVERAGE YEARLY XENON-133 CONCENTRATION IN UNRESTRICTED AREAS

Assuming an accidental release of 20 millicuries of Xenon-133, the average yearly concentration released through the exhaust air at the stack, will be:

20 ml/wk x 52 wks/year x 1000 microCi/mCi/

/ 2000* cfm x 2.8×10 ml/cf x 52 wks x 168 hr/wk x 60 min/hr

= 4.72×10^{-8} microcuries per milliliter

This is below the permitted concentration of 3×10^{-7} mCi/ml.

* estimated total exhaust in Nuclear Medicine.

SUMMARY:

1. the Gamma Camera Room will be provited with an exhaust flow of 600 cfm . The system will be controlled by an On-Off switch accessible from inside the room.

2. All vents will be near the floor.

3. The exhaust will be separetely vented to a stack at least 7 feet above the roof level, and will run continuously for 168 hours per week.

4. The exhaust system should be checked at least once a year to assure it is functioning and that the proper cfm is maintained

5. The air supply to the room shall be checked to assure negative pressure. Should the pressure be found to be positive, the exhaust shall be increase by at least 100 cfm above the rate of air supply to the Gamma Camera Room.

George N. Zacharopoulos.

Certified Radiological Physicist
American Board of Radiology
American Board of Medical Physics