HEARTLAND
HOSPITAL WEST

October 4, 1985

Ms. Evelyn Mattson
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Allen, Illinois 60137

RE: Control #79080

Dear Ms. Mattson:

This letter is in response to your request for additional information so that the review of our radioactive materials license can be completed. The responses are in the order of your questions.

1. Please delete our request to have Dr. Reddy perform P-32 treatments at our facility. We have enclosed a copy of his American Board of Radiology Certification in Therapeutic Radiology for Group VI use.

2. We do wish to be authorized for Group VI procedures. The possession limit should be 2 Curies.

3. We wish to be authorized for Group V procedures. Dr. Stevens and Dr. Heins should be authorized for all Group V procedures. Dr. Tines should be authorized for only Iodine 131 for therapy. These physicians are currently licensed under NRC License #24-13246-01, issued to Heartland Hospital East.

4. We have enclosed a copy of the Bio-Assay Form.

5. We have enclosed a diagram of the Nuclear Medicine Department which indicates the supply and exhaust rates.

6. We have submitted a diagram of the storage area for Group VI sources.

7. We have enclosed two copies of the Xe-133 supplement.

If you have any other requests concerning this license renewal please do not hesitate to call.

Sincerely,

Mike McGeehan
Director

801 FARAON ST. JOSEPH, MISSOURI 64501

The American Board of Radiology

Organized through the cooperation of the
American College of Radiology, the American Roentgen Ray Society,
the American Radium Society, the Radiological Society of North America,
the Section on Radiology of the American Medical Association
and the American Society of Therapeutic Radiologists
Hereby certifies that

Eashwer Kanthala Reddy, M.D.

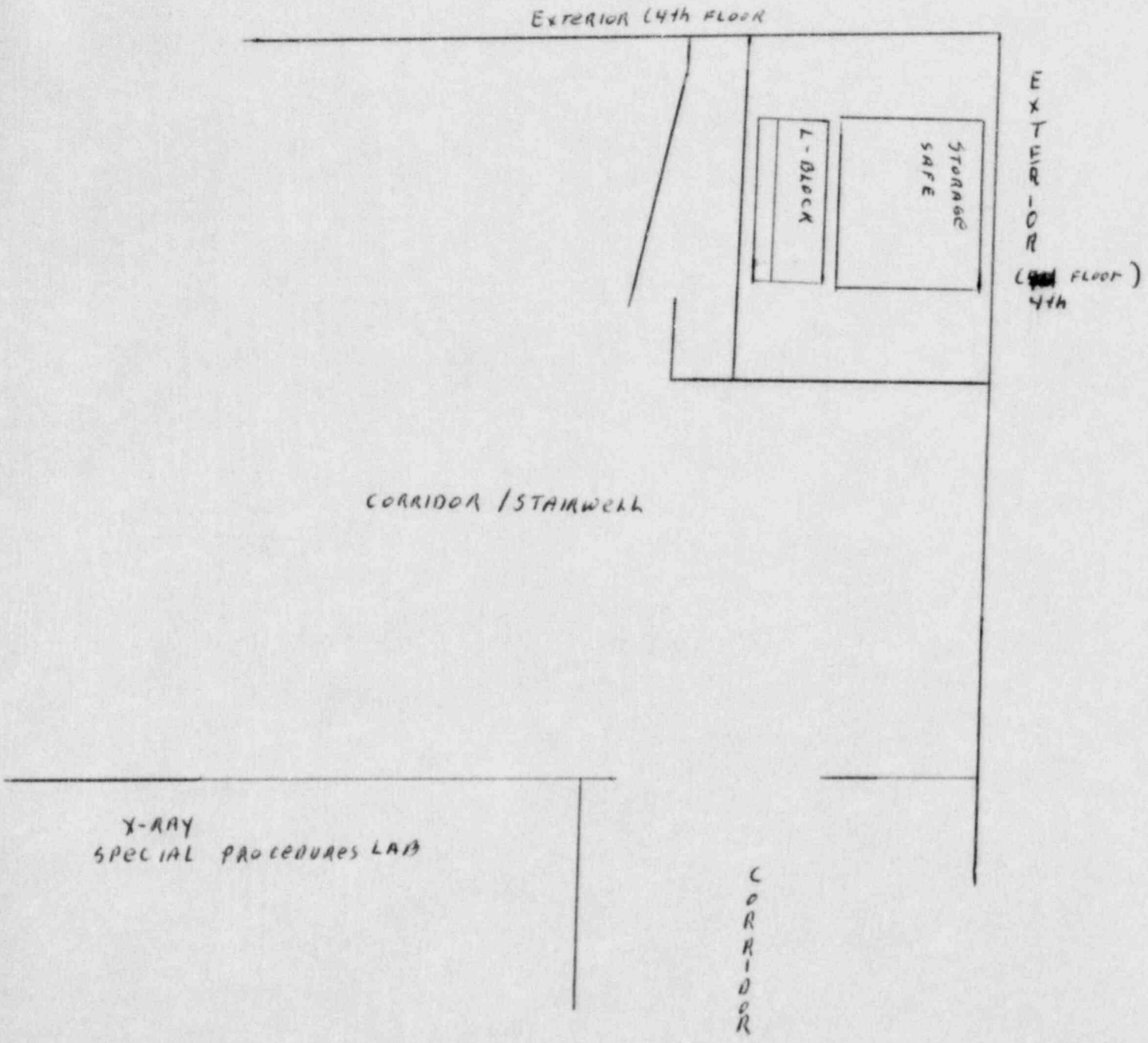
Has pursued an accepted course of graduate study
and clinical work, has met certain standards and qualifications and
has passed the examinations conducted under the authority of
The American Board of Radiology
On this seventh day of June, 1975
Thereby demonstrating to the satisfaction of the Board
that he is qualified to practice the specialty of

Therapeutic Radiology

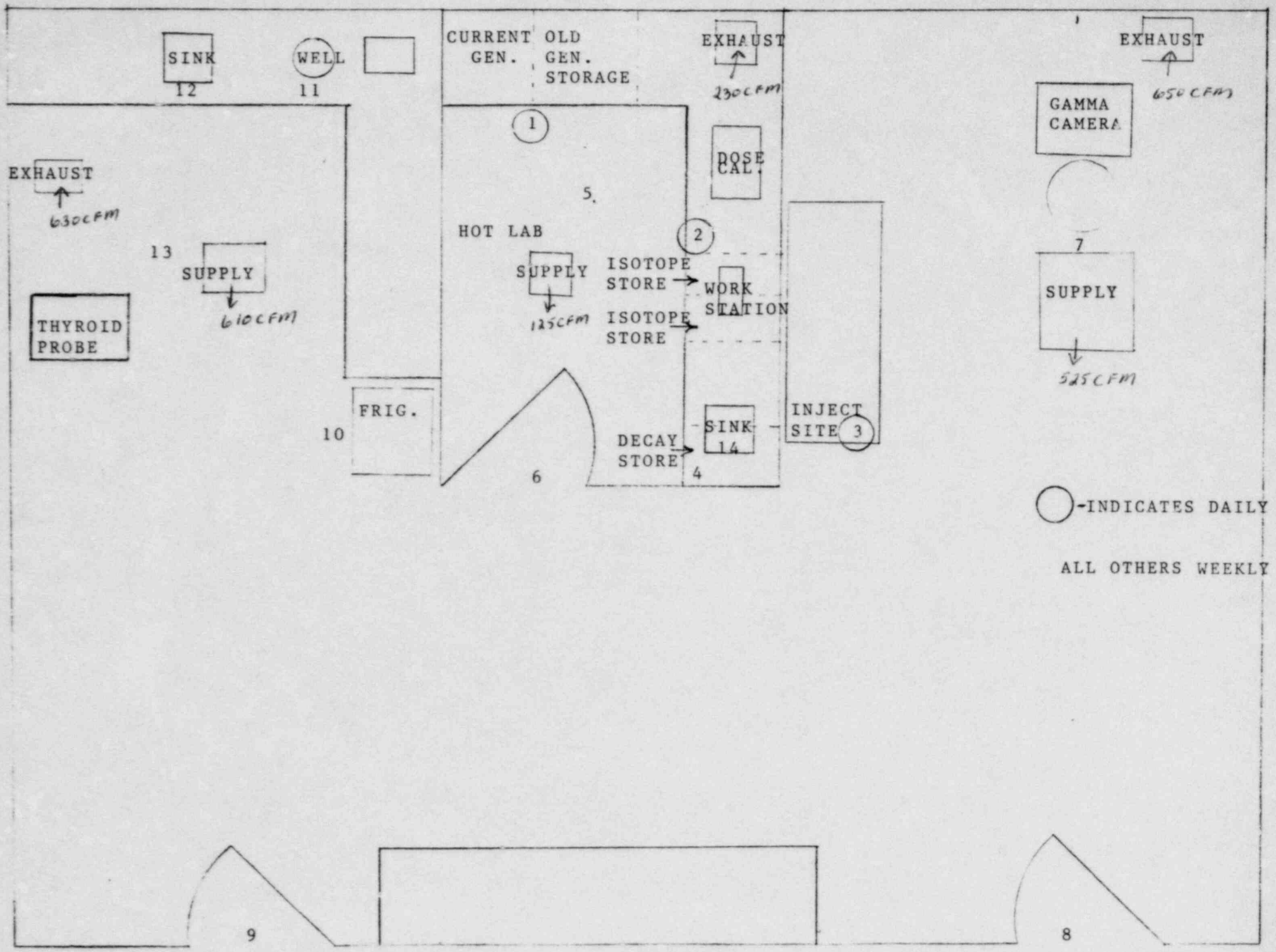
Robert N. Cooley
President

C. Allen Good
Secretary

GROUP VI STORAGE AREA
HEARTLAND HOSPITAL - WEST



DATE: 10/1/85


SINK
12
WELL
11
CURRENT GEN.
OLD GEN. STORAGE
EXHAUST
230CFM
EXHAUST
650CFM
GAMMA CAMERA
1
DOSE CAL.
EXHAUST
630CFM
5
HOT LAB
2
7
13
SUPPLY
610CFM
SUPPLY
125CFM
ISOTOPE STORE
WORK STATION
ISOTOPE STORE
SUPPLY
525CFM
THYROID PROBE
FRIG.
10
INJECT SITE
3
SINK 14
DECAY STORE
4
6
-INDICATES DAILY
ALL OTHERS WEEKLY
9
8

BI-WEEKLY I-131 BIOASSAY

$$\text{Thyroid Activity} = (\text{STD Activity}) \times \frac{\text{Thyroid net CPM}}{\text{STD. Net CPM}} < .04\,\mu Ci$$

DATE	NAME	THYROID CPM	− BKG CPM	= NET THYROID CPM	STD ACT.	STD CPM	NET STD CPM	THYROID ACTIVITY (uCi)

Xe-133 Supplement

1. Quantities to be used:
   a. 5 patients per week
   b. 10 mCi/patient 150 mCi
   c. possession limit: [illegible]

2. Use and storage area:
   Please see the attached diagram of the nuclear medicine area. The area has a hot lab which will house the Xe-133 trap when it is not being used.

3. Ventilation information:
   a. Hot Lab: The hot lab has 230 CFM exhaust and 125 CFM supply

   b. Imaging area: The imaging area has 525 CFM supply and 650 CFM exhaust.

   c. Thyroid/Cold Lab: This area has 630 CFM exhaust and 610 CFM supply.

   d. Ventilation Summary: Supply 1260 CFM; Exhaust 1510 CFM

   e. The exhausted air from nuclear medicine is combined in a larger exhaust system which is vented on the top of the building. The exhaust rate of the system is not known exactly, so we will assume that it is equal to only the air exhausted from Nuclear Medicine. The system exhaust fan is located near the exhaust vent so that there is a negative pressure throughout the system. The nearest air intake vent is approximately 100 feet away.

   f. Air flow rates will be insured by semi-annual preventive maintenance checks performed by the hospital engineering department or an outside consultant

4. Procedures for routine use:
   An Atomic Development Xe-133 delivery/trap system will be used. Procedures for its use will be as indicated in the instrument manual. In addition, patients will breath through a face mask to prevent the accidental loss of Xe-133. For patients that cannot be fitted with a face mask a nose clamp will be used to prevent exhaling into the room.

5. Emergency Procedure:
   In the event of an accidental release of Xe-133 into the room, proceed as follows:

   a. Procure the low level survey meter, evacuate the area, and insure that all access doors to the area are closed (the low level survey meter shall be on hand and available as part of the equipment necessary while performing Xe-133 procedures).

   b. Wait 30 minutes and resurvey the area. The room area must return to background levels before work may be resumed.

6. Air concentration of Xe-133

a. Restricted area:

1. Quantities to be used
   (a) 5 patients per week
   (b) 10 mCi per patient
   (c) 50 mCi/week = 5.0×10^{4} uCi/week

2. $v = \frac{A \times f}{c}$

$$= \frac{(5.0 \times 10^{4}\ \text{uCi/week})(.2)}{1 \times 10^{-5}\ \text{uCi/ml}} = 1.00 \times 10^{9}\ \text{ml/week}$$

The required ventilation rate is

$$\frac{1.00 \times 10^{9}\ \text{ml/week}}{40\ \text{hrs/week}} \times \frac{1\ \text{CFM}}{1.7 \times 10^{6}\ \text{ml/hr}} = 14.7\ \text{CFM}$$

The ventilation rate from the nuclear medicine scanning room greatly exceeds the required value.

b. Unrestricted area: From the table in Appendix M, 6 (a-5) it can be seen that the exhaust rate on the roof (1510 CFM minimum) greatly exceeds the volume needed to dilute any Xe-133 that is lost from the patients/trap in nuclear medicine.

7. The Charcoal trap will be monitored monthly to insure that it is trapping at least 80% efficiently. This determination will be made by (1) measuring the radiation level at the intake port of the charcoal trap, (2) taking a subsequent reading at the exhaust port of the trap and (3) comparing the two readings to insure that the exhaust port reading does not exceed 20% of the intake reading. If the exhaust reading exceeds 20%, the trap will be replaced.

Saturated filters will be handled and replaced in the hot lab area using the manufacturer's suggested methods. Ample lead shielding is available for storing the charcoal filters until they decay to background. The individual removing the filters will use lead gloves and wear a lead apron. The filters will be placed in a double plastic bag and sealed. After decay to background levels the filters will be monitored and disposed of as normal trash.

Miscellaneous information

1. St.Joseph's Hospital and Methodist Hospital in St.Joseph, Missouri have combined. The new name for Methodist Hospital is Heartland Hospital West.

2. With the merger of the two facilities an effort is going to be made to utilize the hot lab facility at Heartland East. This facility will prepare kit material and ship it to the West facility in either unit doses or bulk dose. The utilization of a single hot lab facility will substantially reduce the cost between the two hospitals. A letter from the Administrator at the East and West facilities agreeing to this procedure is enclosed.

The initial plan is to have Heartland Hospital East supply Heartland Hospital West nuclear medicine department with unit doses in a syringe ready to inject. Any kit prepared material licensed under Group II might be transferred from the East facility to the West facility. In addition, long-lived materials such as Xe-133, Yb, Ga, Tl, etc. might be transferred. The activity per syringe to be transferred will depend on the normal prescribed dose at the West facility. There will be no Group VI transfers between these hospitals.

The procedure for initiating a transfer is for the Nuclear Medicine Technologist at Heartland West to call Heartland East with the doses needed at that time. The technologist at the East facility will then draw up the doses, assay them in the dose calibrator, and place them in individual unit dose shields obtained from Syncor International in Kansas City, Mo. The unit doses/shields will be placed in a DOT approved brief case (also obtained from Syncor) which has been labeled that it is containing radioactive materials. There will also be a label placed on the case indicating the material shipped and the activities of each. A radiation survey will be performed at the surface of the container and at three feet. In addition, the outside of the case will be wipe tested and the wipe test counted on the thin end window GM probe. The case(s) will be placed in the trunk of the transporting vehicle. The placement in the trunk is to prevent any unauthorized removal from the vehicle. When the material is received at the Heartland West facility, the material will be checked for correctness (compound/activity). In addition, a radiation survey will be performed at the surface and at three feet from the cases. A wipe test will be performed on the final source containers. After the unit dose shields are removed from the case, a radiation survey will be performed on the case to insure that it is not contaminated. If the ordered material was received and the radiation/wipe test do not reveal any contamination, the transporting vehicle will not be surveyed. If contamination is found on the material or if the material does not coincide with what was ordered, the vehicle will be surveyed.

The Heartland Hospitals will employ shared Nuclear Medicine Technologists. It will be their responsibility to transport the material from the East facility to the West facility. These individuals will receive training in accordance with 10 CFR 19.12 and decontamination procedures to be followed in event of spills.

Safety procedures to be followed include having a decontamination kit in the transporting vehicle, having a notice on the dashboard of the car informing personnel that radioactive material is contained in the trunk. This notice will indicate who to call in the event of an accident and give a description of the material being transported (unit dose, diagnostic quantity, etc.) The decontamination kit will include gloves, booties, radiation material tape, a cleaning solution, plastic bags, a low level thin end window GM survey meter, and paper towels.

In the event of an accident, the Nuclear Medicine Technologist will use the low level survey meter to determine whether or not the radioactive material has spilled or become lost. If it has been determined that a spill has occurred, the decontamination kit will be used to contain and clean up the material. The Nuclear Medicine Technologist will call the department supervisor at Heartland Hospital East to inform him of the accident.

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