ST. MARY'S
MEDICAL CENTER
2900 First Avenue • Huntington, WV 25702
304-526-1234 • www.st-marys.org

March 3, 2006

MMSBL

U.S. Nuclear Regulatory Commission
Materials Licensing Branch, Region II
Atlanta Federal Center
61 Forsyth Street, SW Suite 23T85
Atlanta, GA 30303-3415

03003388

Re: Amendment to License 47-09576-01 to re-locate nuclear cardiology services.

Dear Reviewer:

We request amendment of License 47-09576-01 to re-locate the nuclear cardiology services of our health system. Enclosed are supporting documents including a scaled layout of the new area.

Should you have any questions or require additional information, please contact me or the Radiation Safety Officer (M. Douglass Allan, M.S., DABR at phone (304) 526-1141.

Thank you for your consideration of our request for amendment of our license.

Sincerely,

Michael G. Sellards
President and CEO

2006 MAR 21 AM 11:06
REGION 1

138600

NMSS/RGN1 MATERIALS-002

St. Mary's Medical Center
2900 First Avenue
Huntington, WV 25702-1241

APPLICATION FOR AMENDMENT

1. License No.:	47-09576-01	2. Amendment No. (*of current license*):	45	3. Expiration Date	February 28, 2013
4. Licensee name as it currently appears on license:		St. Mary's Medical Center			
5. Physical Address:		2900 First Avenue Huntington, WV 25702-1241			
6. Mailing Address:		2900 First Avenue Huntington, WV 25702-1241			
7a. Radiation Safety Officer *(as listed on current license)*		M. Douglass Allan, M.S.			
b. Telephone No.: (304) 526-1141		c. Facsimile No. (304) 526-8945		d. E-mail Address doug.allan@st-marys.org	
8a. Name, title, and contact information of person to be contacted about this amendment *(if other than RSO)*		Michael H. Biddy, M.S.			
b. Telephone No. (304) 522-1550 ext. 245		c. Facsimile No. (304) 522-0704		d. E-mail Address mbiddy@radiology-inc.com	
9. Description of Action(s) Requested (use space at right for additional information) ☐ Name Change? ☐ Radiation Safety Officer Change? ☐ Add/delete authorized users? *(training/certifications included)* ☐ Add/delete isotopes *(form, quantity, possession limit, use included)* ☐ Add/delete/modify procedures? ☐ Correction(s) to existing license? ☐Other		The Nuclear Cardiology services of St. Mary's Medical Center will be relocating within the facility. The new area is to provide better accessibility to non-invasive cardiology testing. Enclosed is a layout of the proposed area as well as documentation indicating that the new are would meet the guidelines of NCRP and the requirements of 10 CFR Part 20 Subpart D Radiation Dose Limits for Individual Members of the Public. Additionally all applicable nuclear medicine policies with regard to area surveys and area wipe test will be in place and enforced for the new area. A small leaded storage cabinet will be used for the minimal waste generated for decay in storage. Tc-99m sestamibi will be the most common isotope and form used in this area with occasional Tl-201 use for viability studies.			

10. Documentation Attached? ■ Yes ☐ No Number of pages or attachments: 8

11. ***On behalf of the applicant named in Item 1., we certify that all information contained herein, including any supplements attached hereto, have been prepared in conformity with all applicable NRC Regulations and is true and correct to the best of our knowledge and belief.***

BY: Michael G. Sellaros — 3/14/06

Signature of Certifying Official — **Date**

Michael G. Sellaros, President and CEO

Printed Name and Title of Certifying Official

THE MEDICAL PHYSICS GROUP, LTD.

Consultants in Radiation Physics

P.O. Box 410493
Saint Louis, MO 63141
(314) 251-7258

Robert F. Turco, Ph.D., DABR
Jean Y. Gu, M.S., DABR
Kenneth L. Andrews, M.S., DABR
Christopher M. Durbin, P.h.D.

ARCH

DEC 0 9 2005

Hospital Building & Equipment Co.
11330 Olive Boulevard
P.O. Box 27339
St. Louis, Missouri 63141

Attention: Frederick S. Scott, Architect

SUBJECT: Revision to the Report of Venting and Radiation Requirements for the Nuclear Medicine Area of St. Mary's Hospital, Huntington, West Virginia

CONDITIONS OF REPORT:
This report of venting and radiation protection requirements in the Nuclear Medicine area of St. Mary's Hospital is based upon the area configuration shown on the blueprint included with the original of this report. The calculations and considerations for the report are as follows:

FACILITIES:

Since the date of the original report in May, 2004 which included calculations and recommendations for the ventilation of Xe-133 gas, the owner states that Xe-133 gas will not be used. However, the ventilation mechanicals have been installed according to those calculations and recommendations which are included in this report for future reference and use of Xe-133 gas.In addition, room numbers have changed and are updated in this report.

The Nuclear Medicine area at St. Mary's Hospital consists of four (4) rooms as follows:

Nuclear Medicine Room #1 Rm 1-115 (250.7 sq. ft.)
(Note: Xe-133 in sealed vials will be used in this room)

Nuclear Medicine room #2 Rm 1-116 (250.7 sq. ft.)
(Note: Xe 133 in sealed vials will be used in this room]

Hot Lab Rm 1-117 (85.4 sq. ft.)
(Note: Xe-133 vials and I-131 will be stored in this room]

Dose Room 1-118 (76.5 sq. ft.)
(Note: Patients will be dosed in this room)

The ceiling height in the Nuclear Medicine Rooms will be 9 feet. The Hot Laboratories will have a ceiling height of 8 feet and will have workbenches with sinks. Each Nuclear Medicine Room will include a small workbench with a sink. Dose Room 1-118 will have a small workbench with a sink and a small vented hood. Because Hot Lab 1-117 can be locked and secured for storage of radioactive materials, Hot Lab 1-117 should also have a small vented hood or exhaust vent for storage of I-131.

RADIONUCLIDE COMPLEMENT:

In Storage:

Quantities of radionuclides stored is unknown, however it is assumed that the radionuclides will be ordered and stored as self shielded unit doses. I-131 is stored and used occasionally in therapeutic quantities.

Dose Administered:

30 millicuries (mCi) of Tc-99m in various forms for imaging studies.
30 mCi of Xe-133 in single dose vials for ventilation studies.

ASSUMPTIONS:

1. All radionuclides will be stored in lead shipping containers with additional local shielding on the workbench in the Hot Laboratory except for short periods during dose preparation and removal. In addition radionuclides taken into the Dose Room or other areas for injection will be shielded in portable lead containers [pigs] except for short periods during injection.

2. Dose preparation and removal from storage will be carried out for short periods of time behind a leaded L-block on the workbench in the Hot Laboratory. Local shielding around sources combined with proper handling techniques will provide adequate protection for persons in and around the Hot Laboratory.

3. A separate exhaust fan will be provided to exhaust the Nuclear Medicine rooms with a flow of 600 cubic feet per minute (cfm) per room through exhausts located near the floor. Hot Lab 1-117 will be exhausted through either a vented hood or an exhaust vent located near the top of the workbench. Dose Room 1-118 will be vented through a small vented hood. The exhausts of Nuclear Medicine Rooms #1 1-115 and #2 1-116, Hot Lab 1-117 and Dose Room 1-118 may be tied together through a single stack. The exhaust stack must be at least 7 ft. above the roof level and will run continuously for 168 hours per week.

4. Conditioned make-up air will be provided as follows: 550 cfm to the Nuclear Medicine Rooms, Hot Laboratories and Dose Room 1-118.The unbalanced inflow/outflow values will be balanced by leakage around the doors. It should be noted that these rooms will be under continuous negative pressure.

5. It is assumed that a total 30 mCi dose of Xenon-133 could be accidentally released in the Nuclear Medicine rooms or in the Hot Laboratory.

6. Calculations of Xe-133 concentrations in restricted and unrestricted areas are carried out for accidental releases only. There will be no purposeful releases of Xe-133 activity. All purposeful disposal of Xe-133 activity will be through a Xenon trap.

7. The MAXIMUM PERMISSIBLE CONCENTRATION (MPC) of Xenon-133 gas in a restricted area is $1x10^{-4}$ microcuries per milliliter (uCi/ml) of air determined for a period of 168 hours in any 7 consecutive days. This MPC will pertain to the entire Nuclear Medicine area.

8. The MPC of Xe-133 in an unrestricted area is $5x10^{-7}$ uCi/ml of air averaged over a time period not greater than a year. (Note: In this report, the averaging will be carried out for a period of 1 week only.) This MPC will pertain to all areas outside of the Nuclear Medicine area.

SHIELDING IN THE HOT LABORATORY:

Shielding Not Required

SHIELDING IN THE NUCLEAR MEDICINE ROOMS:

To prevent interference from radionuclides from patients in adjacent imaging rooms or from stored materials or injected patients in waiting areas the following shielding is recommended:

Nuclear Medicine Room #1 1-115
West wall- 1/16 inch lead to 7ft height

Nuclear Medicine Room #2 1-116
West wall-1/16 inch lead to 7 ft height

VENTING CALCULATIONS FOR HOT LABORATORIES:

Accidental Release of a 30 mCi Dose of Xe-133:

Hot Laboratory 1-117

With a room volume of 682.8 cu. ft., the static concentration, assuming complete mixing, will be $1.55x10^{-3}$ uCi/ml. To bring this concentration down to $1x10^{-4}$ uCi/ml, it will require 2.7 minutes assuming an exhaust flow of 600 cfm through the Hot Laboratory exhaust.

VENTING CALCULATIONS FOR DOSE ROOM 1-118

Accidental Release of a 30 mCi Dose of Xe-133 in the Dose Room 1-118

With a room volume of 612 cu. ft. , the static concentration, assuming complete mixing, will be 1.73×10^{-3} uCi/ml. To bring this concentration down to 1×10^{-4} uCi/ml, it will require 2.9 minutes assuming an exhaust flow of 600 cfm through the Dose Room vented hood.

VENTING CALCULATIONS FOR NUCLEAR MEDICINE ROOMS:

Accidental Release of a 30 mCi Dose of Xe-133 in the Nuclear Medicine Rooms:

It is assumed that a 30 mCi dose of Xe-133 may be accidentally released in these rooms.

Nuc Med #1& #2, Rm 1-115 & Rm 1-116

With a room volume of 2256 cu. ft., the static concentration, assuming complete mixing, will be 4.70×10^{-4} uCi/ml. To bring this concentration down to 1×10^{-4} uCi/ml, it will require 5.8 minutes assuming an exhaust flow of 600 cfm through the room exhaust vent.

VENTING CALCULATIONS FOR UNRESTRICTED AREA:

Assuming Hot Lab Exhaust, Dose room Exhaust and Nuclear Medicine Rooms Exhausts Tied Together

Accidental Release of a 30 mCi Dose of Xe-133 in Unrestricted Area:

With a separate exhaust flow of 2400 cfm in the Nuclear Medicine area for a 168 hour period, the concentration of Xe-133 in the exhaust air at the stack will be:

4.4×10^{-8} uCi/ml

This is well below the MPC of 5×10^{-7} uCi/ml of Xe-133 for unrestricted areas.

VENTING CALCULATIONS FOR UNRESTRICTED AREA;

Assuming Hot Lab Exhaust and each Nuclear Medicine Room Exhausts are Separate

Accidental Release of a 30 mCi Dose of Xe-133 in Unrestricted Area

With a separate exhaust flow of 600 cfm in each Nuclear Medicine Room or in the Hot Lab or Dose Room for a 168 hour period, the concentration of Xe-133 in the exhaust air at the stack will be:

1.75×10^{-7} uCi/ml

These are well below the MPC of 5×10^{-7} uCi/ml for Xe-133 for unrestricted areas

SUMMARY:

To summarize, the requirements for shielding and venting in St Mary's Hospital of Huntington West Virginia are as follows:

1. 1/16 inch lead shielding to 7 foot height is required in:

West walls of Nuclear Medicine Rooms #1 and #2- Rm 1-115 and Rm 1-116.

Protection for all persons around the Hot Laboratory room will be provided by local shielding immediately around all radiation sources and by the use of proper handling equipment and procedures.

2. The Hot Laboratory will be provided with an exhaust flow of 600 cfm through an exhaust vent installed in the room at workbench height or through a vented hood. An exhaust fan will also exhaust the Nuclear Medicine Rooms (through exhaust vents near the floor) with a flow of 600 cfm per room. Dose Room 1-118 will be provided with an exhaust flow of 600 cfm through a vented hood. The exhaust from this (these) fan (s) will be vented together or separately through a stack(s) at least 7 feet above roof level. The fan(s) will run continuously for 168 hours per week. Nuclear Medicine rooms #1 1-115, #2 1-116, Hot Lab 1-117 and Dose Room 1-118 would be vented together as one group.

3. Conditioned air supply to these rooms will be as follows:550 cfm to the Nuclear Medicine rooms, the Hot Laboratory, and Dose Room 1-118. The unbalanced flow will be made up by leakage around the doors. It should be noted that both rooms in the Nuclear Medicine area will be under continuous negative pressure.

Respectfully Submitted,

Robert F. Turco

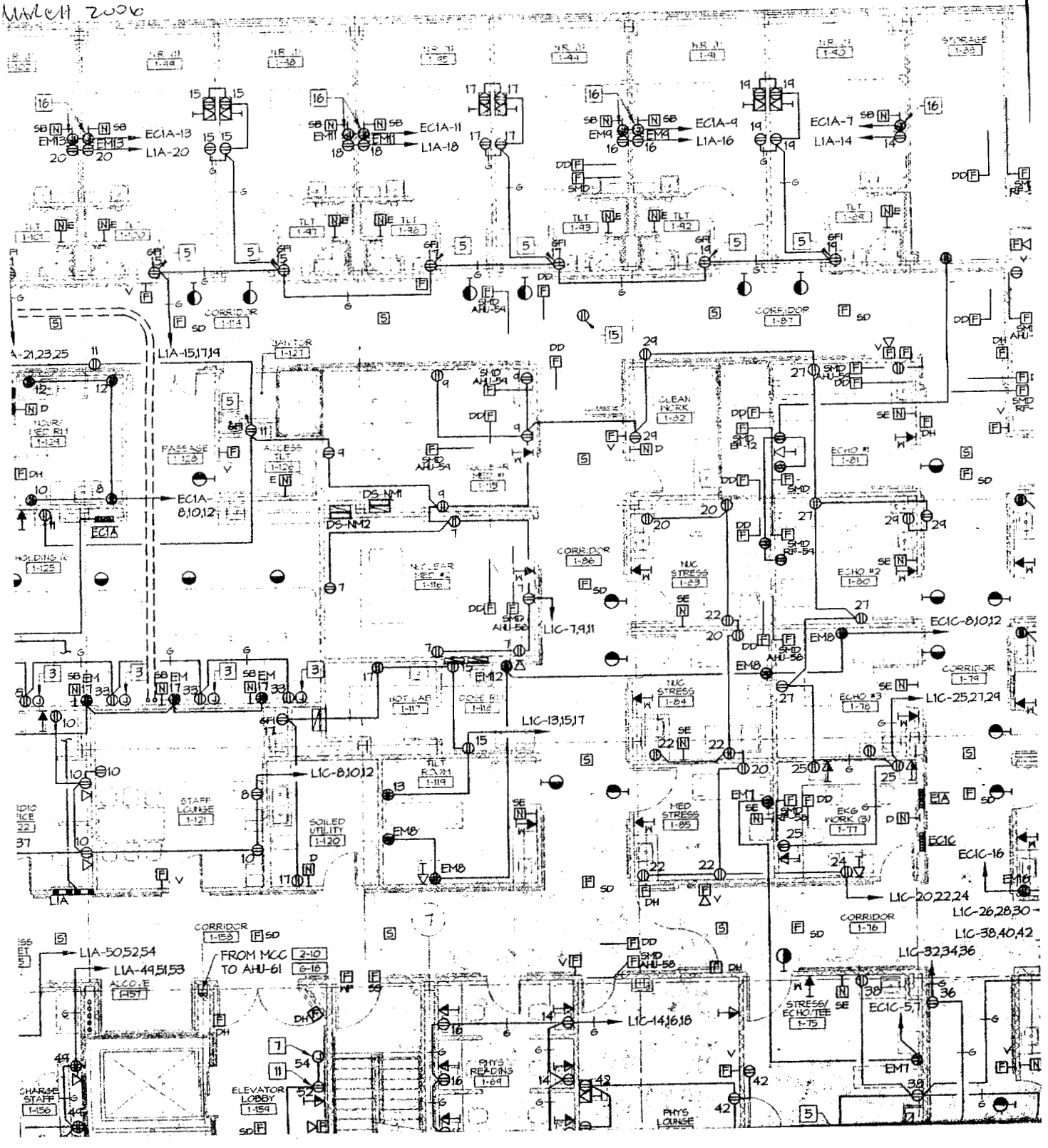
Robert F. Turco, Ph.D., DABR
Certified Radiological Physicist

ST. MARY'S MEDICAL CENTER
2900 FIRST AVE.
HUNTINGTON, WV 25702
47-09576-01

= 4'

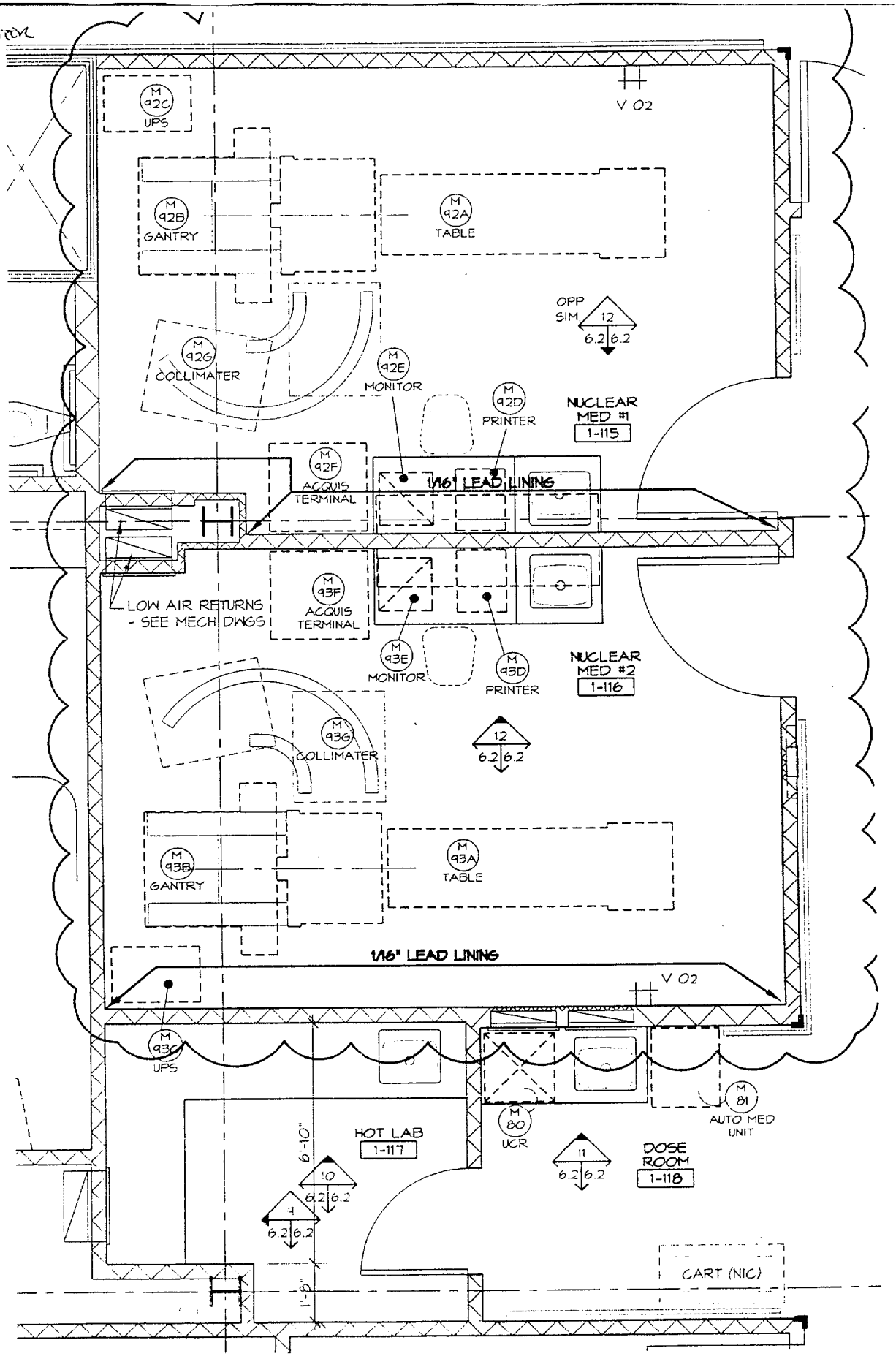
N

MARCH 2006



ST. MARY'S MEDICAL CENTER
2900 FIRST AVE.
HUNTINGTON, WV 25702

47-09576-01



1 / 13 6.2 ENLARGED PLAN

SCALE: 1/4" = 1'-0"

N

MARCH 2006

This is to acknowledge the receipt of your letter/application dated

3/3/2006, and to inform you that the initial processing which includes an administrative review has been performed.

☑ AMEND. 47-09576-01
There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

_____.

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 138600.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader