NRC FORM 313
(7-87)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 6-30-90

# APPLICATION FOR MATERIAL LICENSE

**INSTRUCTIONS:** SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

**APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:**

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

**ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:**

**CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:**

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

**ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:**

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

**IF YOU ARE LOCATED IN:**

**ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:**

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

**ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:**

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

**ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:**

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

**PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.**

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [ ] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER _____
- [X] C. RENEWAL OF LICENSE NUMBER 13-13028-02

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip Code)*

Howard Community Hospital
3500 South LaFountain Street
Kokomo, IN 46902

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Howard Community Hospital
3500 South LaFountain St.
Kokomo, IN 46902

Community Medical Arts Center
Suite 150
3611 S. Reed Rd.
Kokomo, IN 46902 (Gd-153 for bone density)

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Robert T. Anger, Jr., M.S., Consulting Physicist

TELEPHONE NUMBER: 317-929-3572

**SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.**

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*
FEE CATEGORY: Exempt
AMOUNT ENCLOSED: $

13. CERTIFICATION. ***(Must be completed by applicant)*** THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

| SIGNATURE-CERTIFYING OFFICER | TYPED/PRINTED NAME | TITLE | DATE |
|---|---|---|---|
| [signature] | George B. Banjak | Exec. Director | |

9001290282 890130
REG3 LIC30
13-13028-02 PDR

**FOR NRC USE ONLY**

| TYPE OF FEE | FEE LOG | FEE CATEGORY | COMMENTS | APPROVED BY |
|---|---|---|---|---|
| Non | 7b9 | EXCL EXEMPT | 10 CFR 170.11(a)(4)(ii) | cp |
| AMOUNT RECEIVED | CHECK NUMBER | CONTROL NO 84786 | | DATE 2/3/88 |

RECEIVED
JAN 28 1988
REGION III

JAN 28 1988

ATT 10.1

# HOWARD COMMUNITY HOSPITAL
# RADIATION SAFETY OFFICER

The Radiation Safety Officer (RSO) is the authorized representative of the Radiation Safety Committee (RSC) regarding the development and enforcement of rules and procedures to ensure that all use of radioactive material within the institution is conducted in a safe manner, consistent with the ALARA (As Low As Reasonably Achievable) philosophy and program, and in accordance with Nuclear Regulatory Commission (NRC) regulations and the institutional byproduct materials license.

The RSO has the authority to immediately suspend any activities involving radioactive material when they are deemed unsafe, provided the suspension does not interfere with life-saving medical procedures that may warrant overriding priority before the radiation safety problems can be alieviated.

**RESPONSIBILITIES:**

***The Radiation Safety Officer shall:***

1. investigate overexposures, accidents, spills, losses, thefts, unauthorized receipts, uses, transfers, disposals, misadministrations, and other deviations from approved radiation safety practices and implement corrective actions, as necessary.

2. establish, collect in one binder or file, and implement written policies and procedures for:

   a) authorizing the purchase of byproduct material.

   b) receiving and opening packages of byproduct material.

   c) storing byproduct material.

   d) keeping an inventory record of byproduct material.

   e) using byproduct material safely.

   f) taking emergency action if control of byproduct material is lost.

   g) performing periodic radiation surveys.

   h) performing checks of survey instruments and other safety instruments.

CONTROL NO 84786

# HOWARD COMMUNITY HOSPITAL
# RADIATION SAFETY OFFICER

**RESPONSIBILITIES (cont.):**

i) disposing of byproduct material.

j) training personnel who work in or frequent areas where byproduct material is used or stored.

k) keeping a copy of all records and reports required by the NRC regulations, a copy of these regulations, a copy of each licensing request and the license and amendments, and the written policies and procedures required by the regulations.

3. brief management at least once each year on the radiation safety program.

4. establish personnel exposure investigational levels that, when exceeded, will initiate a prompt investigation by the RSO of the cause of the exposure.

5. establish personnel exposure investigational levels that, when exceeded, will initiate a prompt investigation by the RSO of the cause of the exposure and a consideration of actions that might be taken to reduce the probability of recurrence.

6. assist the RSC in the performance of its duties.

Chief Executive Officer

Continuation of NRC Form 313 APPLICATION FOR MATERIAL LICENSE for Howard Community Hospital

**Items 5 and 6:** No change except for addition of depleted uranium as shielding material in a linear accelerator and Co-60 teletherapy unit

Table 1

| Byproduct Material | Amount | Purpose |
|---|---|---|
| 5.a Material in 35.100 | As needed | 6.a Medical Use |
| 5.b Material in 35.200 | As needed | 6.b Medical Use |
| 5.c Implant Material in 35.400 | 1000 mCi | 6.c Medical Use |
| 5.d Material in 35.500 | As needed | 6.d Medical Use |
| 5.e Iodine-131 for treatment of hyperthyroidism | 100 mCi | 6.e Medical Use |
| 5.f Depleted Uranium | As needed | 6.f Shielding in teletherapy unit, Mo/Tc generators, and linear accelerator |

**Item 7:** No change in authorized users or authorized uses. Pete Scott, M.D. is the Radiation Safety Officer and his training and experience credentials are currently on file as a previously approved authorized user

✓ **Item 8:** No change from currently authorized program Training Application 11/5/82

✓ **Item 9.1** No change from previously approved facility diagrams – 11/5/82 Ltrs 12/24/86 3/5/86

✓ **Item 9.2** Survey meters are calibrated by Syncor, Inc. according to procedures approved under NRC license number 13-19229-01 MD, or by return to the manufacturer

✓ **Item 9.3** We have developed a dose calibrator calibration procedure for your review that is appended as ATT 9.3

√ **Item 9.4** We will establish and implement the model personnel external exposure monitoring program published in Appendix D to Regulatory Guide 10.8, Revision 2.

√ **Item 9.5** Not applicable

√ **Item 10.1** We will issue the Radiation Safety Committee Charter and Radiation Safety Officer Delegation of Authority that are appended as ATT 10.1

√ **Item 10.2** We will establish and implement the model ALARA program that was published in Appendix G to Regulatory Guide 10.8, Revision 2

√ **Item 10.3** Leak testing of our sealed sources is performed by our consulting physicist. The procedure followed conforms to the model procedure for leak testing sealed sources that was published in Appendix H to Regulatory Guide 10.8, Revision 2

√ **Item 10.4** We will establish and implement the model safety rules published in Appendix I to Regulatory Guide 10.8, Revision 2

√ **Item 10.5** We will establish and implement the model spill procedures published in Appendix J to Regulatory Guide 10.8, Revision 2

√ **Item 10.6** We will establish and implement the model guidance for ordering and receiving radioactive material that was published in Appendix K to Regulatory Guide 10.8, Revision 2

√ **Item 10.7** We will establish and implement the model procedure for opening packages that was published in Appendix L to Regulatory Guide 10.8, Revision 2

√ **Item 10.8** We will establish and implement the model procedure for a unit dosage record system that was published in Appendix M.1 to Regulatory Guide 10.8, Revision 2

√ **Item 10.9** We will establish and implement the model procedure for a multidose vial record system that was published in Appendix M.2 to Regulatory Guide 10.8, Revision 2

✓ **Item 10.10** We will establish and implement the model procedure for measuring and recording molybdenum concentration that was published in Appendix M.3 to Regulatory Guide 10.8, Revision 2

✓ **Item 10.11** No change from currently approved procedure Appl. 11/5/82

✓ **Item 10.12** We have developed survey procedures for your review that are appended as ATT 10.12

✓ **Item 10.13.1** We will collect spent noble gas in a shielded container and will establish and implement the model procedure for checking trap effluent that was published in Appendix 0.3 to Regulatory Guide 10.8, Revision 2

✓ **Item 10.13.3** We will not directly vent spent aerosols and gases to the atmosphere and therefore no effluent estimation is necessary

✓ **Item 10.13.4** We will calculate spilled gas clearance times according to the procedure that was published in Appendix 0.4 to Regulatory Guide 10.8, Revision 2

✓ **Item 10.14** Not Applicable

✓ **Item 10.15** No change from procedures currently on file Application 11/5/82

✓ **Item 11.1** We will establish and implement the general guidance and model procedures for waste disposal that were published in Appendix R to Regulatory Guide 10.8, Revision 2

ATT 9.3

# HOWARD COMMUNITY HOSPITAL

## DOSE CALIBRATOR QUALITY CONTROL PROCEDURES

### CONSTANCY

FREQUENCY: At least once each day prior to assaying patient doses

ACTION LEVEL: Notify RSO and consider repair or replacement if variance exceeds 5%

Must repair or replace calibrator if variance exceeds 10%

PROCEDURE:

a) confirm operation of automatic background subtract circuit

b) assay the Cs-137 and Co-57 reference sources on the appropriate dose calibrator settings (i.e., Cs-137 on the Cs-137 setting, Co-57 on the Co-57 setting). Assay the Cs-137 source on all other commonly used radionuclide settings. Record assay results on the "Daily Dose Calibrator Quality Control Form" and compare to the appropriate 5% Action Level limits.

### LINEARITY

FREQUENCY: At installation and at least quarterly thereafter

ACTION LEVEL: Repair or adjust the calibrator if the worst deviation is more than 10%. If this cannot be done, then make a correction table or graph to convert indicated activity to true activity and attach the table or graph to the calibrator.

PROCEDURE:

a) Use a vial or syringe of Tc-99m whose activity is at least at large as the maximum activity normally assayed in a prepared radiopharmaceutical kit, in a unit dose syringe, or in a radiopharmaceutical therapy, whichever is largest.

b) Assay the Tc-99m syringe in the dose calibrator and record the date, time to the nearest minute, and the net activity. This first assay should be done early in the morning.

## LINEARITY (cont.)

c) Repeat the assay at about noon, and again at about 4 p.m. Continue on subsequent days until the assayed activity is less than 10 microcuries.

d) Either manually or by computer,

1) convert the time and date information into hours elapsed since the first assay

2) on semilog graph paper, plot the data as activity versus elapsed hours

3) determine the "best fit" straight line through the data points

4) for each data point (or at least the data point farthest from the line), calculate the deviation from the line (activity measured - activity on line / activity on line). Compare the calculated deviation(s) to the 10% Action Level.

## ACCURACY

FREQUENCY: At installation and at least annually thereafter

ACTION LEVEL: Calibrator should be adjusted or repaired if the measured value of a reference standard does not agree within 5% of the certified value

Calibrator must be adjusted or repaired if the measured value of a reference standard does not agree within 10% of the certified value

PROCEDURE:

a) Assay the Cs-137 and Co-57 NBS traceable reference standards on the appropriate settings (i.e., Cs-137 on the Cs-137 setting and Co-57 on the Co-57 setting). Each source must be at least 50 microcuries.

b) Average three determinations of the net activity for each reference source and compare the average values to the decay corrected certified activities. Calculate accuracy variance as (measured - actual) / actual, and compare to the Action Levels.

## ACCURACY (cont.)

c) Repeat the procedure for any other available calibrated reference standards

d) Assay the Cs-137 reference standard on the other commonly used radionuclide settings and record the settings and indicated activity values with the accuracy data.

## GEOMETRY DEPENDENCE

FREQUENCY: At installation

ACTION LEVEL: 5% difference between indicated and true activity

PROCEDURE:

a) Prepare a 3 cc syringe with 1 - 10 millicuries in 0.5 cc.

b) Assay the syringe and record the volume and indicated activity

c) Add an additional 0.5 cc of nonradioactive saline or tap water to the syringe, assay and record the volume and indicated activity

d) Repeat this process up to a volume of 2 cc

e) Divide the indicated activity for the 0.5 cc volume by the indicated activities for each of the other volumes. The quotient is the volume correction factor

f) If any of the volume correction factors are greater than 1.05 or less than 0.95, make a correction table or graph that will allow conversion from "indicated activity" to "true activity"

g) Repeat the above procedure for a 30 cc kit preparation vial, starting with 1 - 10 millicuries in 1 cc and adding 2 cc increments of nonradioactive saline or tap water, up to a total volume of 19cc.

**Notes:** 1) Next due dates for accuracy and linearity checks will be posted on the dose calibrator or on the scheduling calendar

2) The RSO will sign the records of all geometry, linearity and accuracy tests

ATT 10.1

# HOWARD COMMUNITY HOSPITAL
# RADIATION SAFETY COMMITTEE

## CHARGE:

The Radiation Safety Committee has been established to:

1. Ensure that licensed material will be used safely. This includes review as necessary of training programs, equipment, facility, supplies, and procedures.

2. Ensure that licensed material is used in compliance with NRC (Nuclear Regulatory Commission) regulations and the institutional license.

3. Ensure that the use of licensed material is consistent with the ALARA (As Low As Reasonably Achievable) philosophy and program.

4. Establish a table of investigational levels for individual occupational radiation exposures.

5. Identify program problems and solutions.

## ADMINISTRATIVE REQUIREMENTS:

1. Membership will consist of at least three individuals, including the Radiation Safety Officer (RSO), a representative of the nursing service, a representative of management who is neither an authorized user or the Radiation Safety Officer, and an authorized user for each type of use authorized by the license.

2. The Committee will meet as often as necessary to conduct its business, but not less than once in each calendar quarter.

3. To establish a quorum and conduct business, at least one-half of the Committee's membership, including the RSO and the management representative, must be present.

4. To the extent that they do not interfere with the mission of the Committee, management may assign other responsibilities, such as x-ray radiation safety, to the Committee.

# HOWARD COMMUNITY HOSPITAL
# RADIATION SAFETY COMMITTEE
## (Cont.)

**RESPONSIBILITIES:**

***The Committee shall:***

1. be familiar with all pertinent NRC regulations, the license application, the license, and amendments.

2. review, on the basis of safety and with regard to the training and experience standards in Subpart J of 10 CFR Part 35, and approve or disapprove any individual who is to be listed as an authorized user or Radiation Safety Officer, before submitting a license application or request for amendment or renewal.

3. review, on the basis of safety, and approve or disapprove minor changes in radiation safety procedures that are not potentially important to safety and are permitted under 10 CFR Part 35.31, e.g.,

   a) editing policies and procedures

   b) adoption of model programs published in Regulatory Guides

   c) replacement of equipment

   d) reassignments of tasks among employees

   e) assignments of servive contracts for film badges, survey meter calibration, wasie disposal, and safety surveys

4. review and approve or disapprove, on the basis of safety and consistent with the limitations of the regulations, the license, and the ALARA philosophy and program, all requests for authorization to use radioactive material within the institution.

5. prescribe special conditions that may be required during a proposed use of radioactive material, such as requirements for physical examinations of users, bioassays or other special monitoring procedures.

6. review quarterly, with the assistance of the RSO, a summary of the occupational radiation dose records of all personnel working with byproduct material.

# HOWARD COMMUNITY HOSPITAL
# RADIATION SAFETY COMMITTEE
## (Cont.)

**RESPONSIBILITIES (cont.):**

7. review quarterly, with the assistance of the RSO, all incidents involving radioactive material with respect to cause and subsequent actions taken.

8. review at least annually, with the assistance of the RSO, the entire radiation safety program and recommend remedial action to correct any deficiencies identified.

9. establish a program to ensure that all persons whose duties may require them to work in or frequent areas where radioactive materials are used are appropriately instructed as required by 10 CFR Part 19.12.

10. ensure that the byproduct material license is amended, if required, prior to any changes in facilities, equipment, policies, procedures, and personnel.

11. maintain written minutes of all Committee meetings, including members in attendance and members absent, a summary of discussions, actions, recommendations and numerical results of all votes taken.

ATT 10.12

# HOWARD COMMUNITY HOSPITAL

## AREA SURVEY PROCEDURES

### AMBIENT EXPOSURE RATE SURVEYS

1. At the end of each day of use, survey the radiopharmaceutical elution, preparation, and administration areas with a radiation detection survey meter. Diagnostic administrations can occasionally be made in patients' rooms without a survey being required, if special care is taken to remove all paraphernalia.

2. Survey the radiopharmaceutical storage and radiopharmaceutical waste storage areas at least weekly with a radiation detection survey meter.

3. Survey monthly with a radiation detection survey meter laboratory areas where only small quantities (less than 200 microcuries at a time) of gamma emitting radioactive material are processed.

4. Record exposure rate (mR/h) results along with the date, area surveyed, equipment used, the name or initials of the surveyor, and a drawing showing the areas surveyed and exposure rate action levels.

### REMOVABLE CONTAMINATION SURVEYS

1. In radiopharmaceutical elution, preparation, administration, storage and disposal areas, survey weekly for removable contamination.

2. In laboratory areas where only small quantities (less than 200 microcuries at a time) of gamma emitting radioactive material are processed, survey monthly for removable contamination.

3. The wipe sample assay procedure should be sufficiently sensitive to detect the presence of 2000 dpm/100 $cm^2$ of removable contamination (200 dpm/100 $cm^2$ for isotopes of iodine).

4. Record contamination levels (in dpm/100 $cm^2$) results along with the date, area surveyed, equipment used, name or initials of the surveyor, and a drawing showing the areas surveyed and removable contamination action levels.

### GENERAL COMMENTS

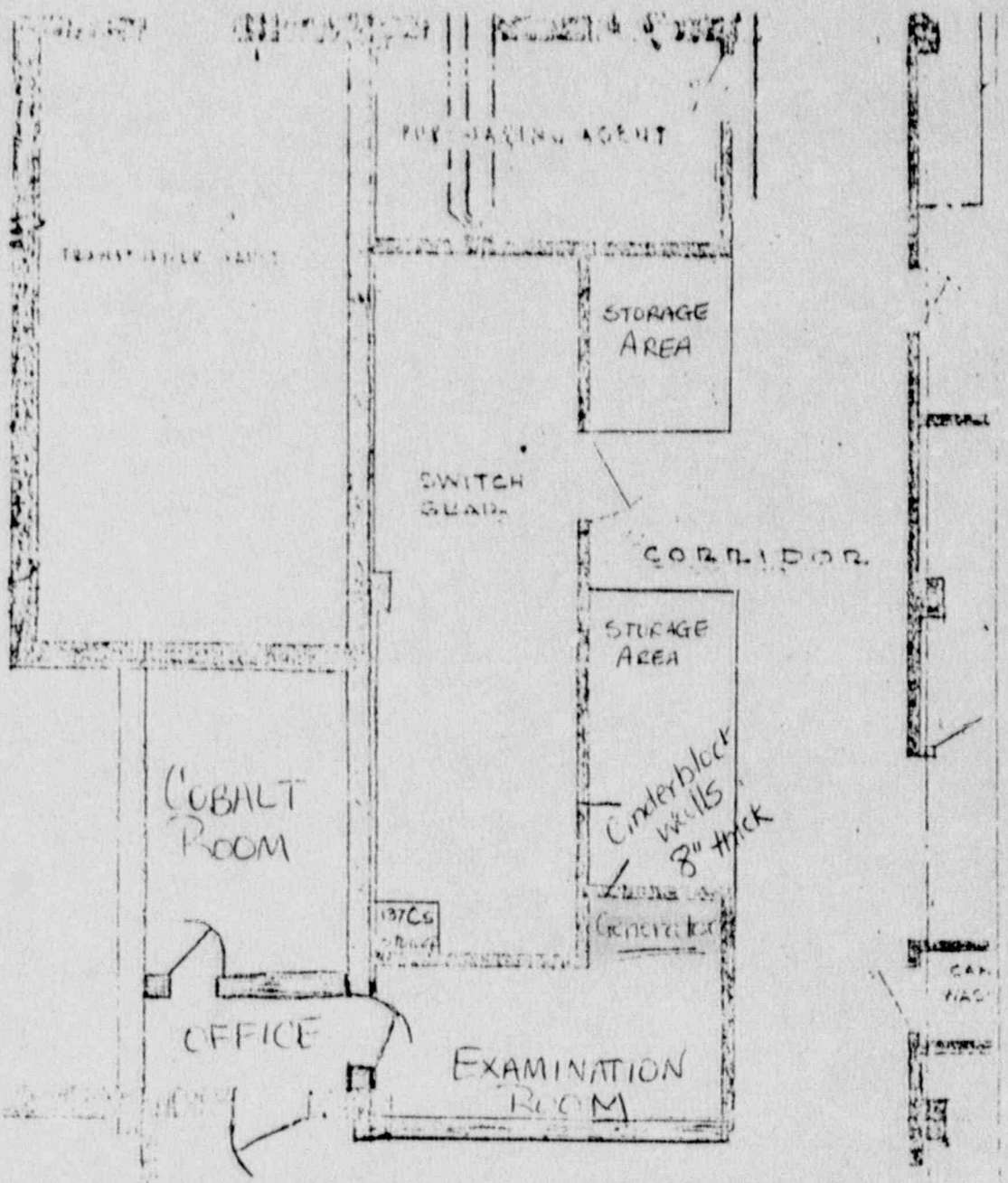
1. Immediately notify the RSO if unexpectedly high levels are found.

2. Record actions taken and followup survey information in the case of excessive exposure rates or removable contamination.

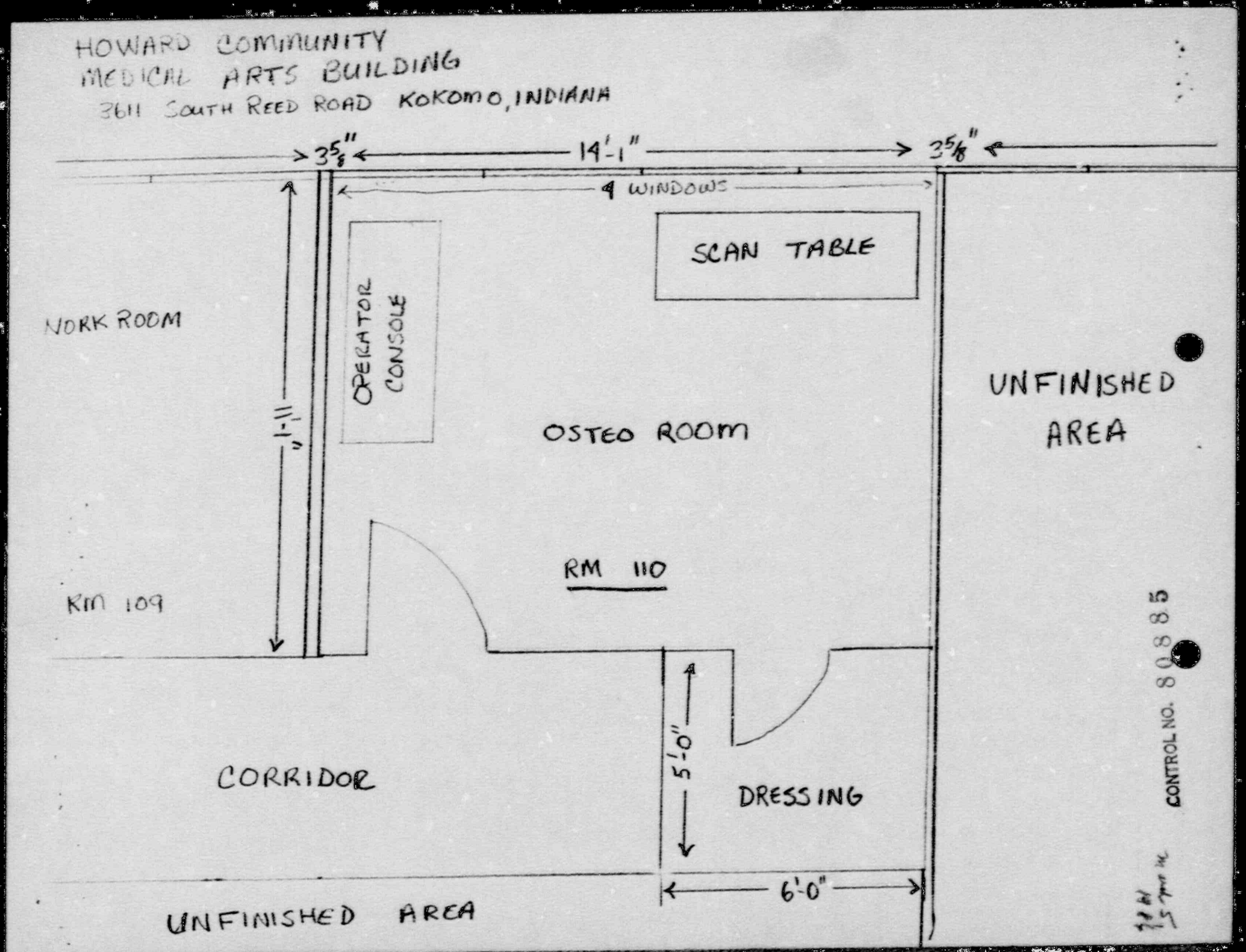
3. The RSO should review and initial these records at least quarterly.

CONTROL NO. 84786

Dec 2 41 PG




CORRIDOR CONTROL NO. 82728


HOWARD COMMUNITY
MEDICAL ARTS BUILDING
3611 SOUTH REED ROAD KOKOMO, INDIANA
3 5/8"
14'-1"
3 5/8"
4 WINDOWS
SCAN TABLE
OPERATOR CONSOLE
WORK ROOM
11'-11"
OSTEO ROOM
UNFINISHED AREA
RM 110
RM 109
5'-0"
CORRIDOR
DRESSING
6'-0"
UNFINISHED AREA
CONTROL NO. 80885

13-13028-02
030-13342

NRC FORM 313M (9-81) 10 CFR 35

U.S. NUCLEAR REGULATORY COMMISSION

# APPLICATION FOR MATERIALS LICENSE – MEDICAL

Approved by OMB 3150-0041 Expires 9-30-83

**INSTRUCTIONS** - *Complete Items 1 through 26 if this is an initial application or an application for renewal of a license. Use supplemental sheets where necessary. Item 26 must be completed on all applications and signed. Retain one copy. Submit original and one copy of entire application to: Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Upon approval of this application, the applicant will receive a Materials License. An NRC Materials License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Parts 19, 20 and 35 and the license fee provision of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in Item 26 and the appropriate fee enclosed.*

1.a. NAME AND MAILING ADDRESS OF APPLICANT *(Institution, firm, clinic, physician, etc.)* INCLUDE ZIP CODE

Howard Community Hospital
3500 S. Lafountain
Kokomo, Indiana 46901

TELEPHONE NO. AREA CODE (317) 453 8413

1.b. STREET ADDRESS(ES) AT WHICH RADIOACTIVE MATERIAL WILL BE USED *(If different from 1.a.)* INCLUDE ZIP CODE

2. PERSON TO CONTACT REGARDING THIS APPLICATION

Karen Shanks, NMT

TELEPHONE NO. AREA CODE (317) 453 8413

3. THIS IS AN APPLICATION FOR: *(Check appropriate item)*

a. ☐ NEW LICENSE
b. ☐ AMENDMENT TO LICENSE NO.
c. ☒ RENEWAL OF LICENSE NO. 13-13028-02

4. INDIVIDUAL USERS *(Name individuals who will use or directly supervise use of radioactive material. Complete Supplements A and B for each individual.)*

See attached item 4

5. RADIATION SAFETY OFFICER (RSO) *(Name of person designated as radiation safety officer. If other than individual user, complete resume of training and experience as in Supplement A.)*

Pete Scott, M.D.

6.a. RADIOACTIVE MATERIAL FOR MEDICAL USE

| RADIOACTIVE MATERIAL LISTED IN: | ITEMS DESIRED "X" | MAXIMUM POSSESSION LIMITS (In millicuries) |
|---|---|---|
| 10 CFR 31.11 FOR IN VITRO STUDIES | | |
| 10 CFR 35.100, SCHEDULE A, GROUP I | X | AS NEEDED |
| 10 CFR 35.100, SCHEDULE A, GROUP II | X | AS NEEDED |
| 10 CFR 35.100, SCHEDULE A, GROUP III | X | 2000 |
| 10 CFR 35.100, SCHEDULE A, GROUP IV | | AS NEEDED |
| 10 CFR 35.100, SCHEDULE A, GROUP V | | AS NEEDED |
| 10 CFR 35.100, SCHEDULE A, GROUP VI | X | 1000 |

| ADDITIONAL ITEMS: | MARK ITEMS DESIRED "X" | MAXIMUM POSSESSION LIMITS (In millicuries) |
|---|---|---|
| IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM | X | 30 |
| PHOSPHORUS-32 AS SOLUBLE PHOSPHATE FOR TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA AND BONE METASTASES | | |
| PHOSPHORUS-32 AS COLLOIDAL CHROMIC PHOSPHATE FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS. | | |
| GOLD-198 AS COLLOID FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS. | | |
| IODINE-131 AS IODIDE FOR TREATMENT OF THYROID CARCINOMA | | |
| XENON-133 AS GAS OR GAS IN SALINE FOR BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES | X | 200 |

6.b. RADIOACTIVE MATERIAL FOR USES NOT LISTED IN ITEM 6.a. *(Sealed sources up to 3 mCi used for calibration and reference standards are authorized under Section 35.14(d), 10 CFR Part 35, and NEED NOT BE LISTED.)*

| ELEMENT AND MASS NUMBER | CHEMICAL AND/OR PHYSICAL FORM | MAXIMUM NUMBER OF MILLICURIES OF EACH FORM | DESCRIBE PURPOSE OF USE |
|---|---|---|---|
| | | | |

RECEIVED BY ERIN
Date 11/19/82
Log NOV 16 Reg III
By Brown
Org. To
Action Compl.

NRC FORM 313M (9-81)

NOV 8 1982

CONTROL NO. 0031

## INFORMATION REQUIRED FOR ITEMS 7 THROUGH 23

For Items 7 through 23, check the appropriate box(es) and submit a detailed description of all the requested information. Begin each item on a separate sheet. Identify the item number and the date of the application in the lower right corner of each page. If you indicate that an appendix to the medical licensing guide will be followed, do not submit the pages, but specify the revision number and date of the referenced guide: Regulatory Guide 10.8 , Rev. 1 Date: Jan 1981

| | |
|---|---|
| **7. MEDICAL ISOTOPES COMMITTEE** | |
| | Names and Specialties Attached; and See attached item 7 |
| X | Duties as in Appendix B; or |
| | Equivalent Duties Attached *(Check One)* |
| **8. TRAINING AND EXPERIENCE** | |
| | Supplements A & B Attached for Each Individual User; and already on file with license |
| | Supplement A Attached for RSO. |
| **9. INSTRUMENTATION** *(Check One)* | |
| X | Appendix C Form Attached; or |
| | List by Name and Model Number |
| **10. CALIBRATION OF INSTRUMENTS** | |
| X | Appendix D Procedures Followed for Survey Instruments; or |
| | Equivalent Procedures Attached; and *(Check One)* |
| X | Appendix D Procedures Followed for Dose Calibrator; or |
| | Equivalent Procedures Attached *(Check One)* |
| **11. FACILITIES AND EQUIPMENT** | |
| X | Description and Diagram Attached |
| **12. PERSONNEL TRAINING PROGRAM** | |
| X | Description of Training Attached |
| **13. PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL** | |
| X | Detailed Information Attached |
| **14. PROCEDURES FOR SAFELY OPENING PACKAGES CONTAINING RADIOACTIVE MATERIALS** *(Check One)* | |
| | Appendix F Procedures Followed; or |
| X | Equivalent Procedures Attached |

| | |
|---|---|
| **15. GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIAL** *(Check One)* | |
| X | Appendix G Rules Followed; or |
| | Equivalent Rules Attached |
| **16. EMERGENCY PROCEDURES** *(Check One)* | |
| X | Appendix H Procedures Followed; or |
| | Equivalent Procedures Attached |
| **17. AREA SURVEY PROCEDURES** *(Check One)* | |
| | Appendix I Procedures Followed; or |
| X | Equivalent Procedures Attached |
| **18. WASTE DISPOSAL** *(Check One)* | |
| X | Appendix J Form Attached; or |
| | Equivalent Information Attached |
| **19. THERAPEUTIC USE OF RADIOPHARMACEUTICALS** *(Check One)* | |
| | Appendix K Procedures Followed; or |
| | Equivalent Procedures Attached |
| **20. THERAPEUTIC USE OF SEALED SOURCES** | |
| X | Detailed Information Attached; and |
| | Appendix L Procedures Followed; or *(Check One)* |
| X | Equivalent Procedures Attached |
| **21. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE GASES (e.g., Xenon – 133)** | |
| X | Detailed Information Attached |
| **22. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL IN ANIMALS** | |
| | Detailed Information Attached |
| **23. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b** | |
| | Detailed Information Attached |

## 24. PERSONNEL MONITORING DEVICES

| TYPE (Check appropriate box) | | | SUPPLIER | EXCHANGE FREQUENCY |
|---|---|---|---|---|
| a. WHOLE BODY | | FILM | Landauer | monthly |
| | | TLD | | |
| | | OTHER (Specify) | | |
| b. FINGER | | FILM | | |
| | | TLD | Landauer | monthly |
| | | OTHER (Specify) | | |
| c. WRIST | | FILM | | |
| | | TLD | | |
| | | OTHER (Specify) | | |

d. OTHER (Specify)

## 25. FOR PRIVATE PRACTICE APPLICANTS ONLY

a. HOSPITAL AGREEING TO ACCEPT PATIENTS CONTAINING RADIOACTIVE MATERIAL

NAME OF HOSPITAL

MAILING ADDRESS

CITY | STATE | ZIP CODE

b. ATTACH A COPY OF THE AGREEMENT LETTER SIGNED BY THE HOSPITAL ADMINISTRATOR.

c. WHEN REQUESTING THERAPY PROCEDURES, ATTACH A COPY OF RADIATION SAFETY PRECAUTIONS TO BE TAKEN AND LIST AVAILABLE RADIATION DETECTION INSTRUMENTS.

## 26. CERTIFICATE

*(This item must be completed by applicant)*

The applicant and any official executing this certificate on behalf of the applicant named in Item 1a certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Parts 30 and 35, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

a. LICENSE FEE REQUIRED
*(See Section 170.31, 10 CFR 170)*

(1) LICENSE FEE CATEGORY: EXEMPT - County Hospital

(2) LICENSE FEE ENCLOSED: $ NA

b. APPLICANT OR CERTIFYING OFFICIAL *(Signature)*
X George Banjak

(1) NAME *(Type or Print)*
Mr. George Banjak

(2) TITLE
Executive Director

c. DATE
November 5, 1982

NRC FORM 313M (9-81)

## PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313M. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).

2. **PRINCIPAL PURPOSE(S)** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30-36 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.

3. **ROUTINE USES** The information may be used: (a) to provide records to State health departments for their information and use; and (b) to provide information to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for a NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you. A copy of the license issued will routinely be placed in the NRC's Public Document Room, 1717 H Street, N.W., Washington, D.C.

4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed.

5. **SYSTEM MANAGER(S) AND ADDRESS** Director, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

NRC FORM 313M
(9-81)

| NAME OF AUTHORIZED USER | AUTHORIZATION |
| --- | --- |
| Charles F. Smith, M.D. | Group VI |
| Earl Robert Blue, M.D. | Groups I, II, and III<br>Group VI<br>Xenon-133 |
| Pete Scott, M.D. | Groups I,II, and III<br>Xenon-133<br>**I-131 for treatment of hyperthyroidism** |

Item 4
10/31/82

# RADIATION SAFETY COMMITTEE

The membership of this committee will consist of at least three members and will include:

1. the radiation safety officer

2. the hospital administrator or other administrative official directly responsible to the hospital administrator in the hospital's internal chain of command

3. a physician specialist, or supervisory paramedical professional, from each department where radioactive materials are used

4. a representative of the hospital's nursing staff

The names and qualifications of the committee members will be documented in the committee's records, will be updated as necessary, and will be available for inspection by the NRC.

## APPENDIX C

## INSTRUMENTATION

1. Survey meters

   a. Manufacturer's name: Victoreen

   Manufacturer's model number: 490

   Number of instruments available: 1

   Minimum range: 0 mR/hr to .2 mR/hr

   Maximum range: 0 mR/hr to 20 mR/hr

   b. Manufacturer's name: Ludlum

   Manufacturer's model number: 14C

   Number of instruments available: 1

   Minimum range: 0 mR/hr to .2 mR/hr

   Maximum range: 0 mR/hr to 2000 mR/hr

2. Dose calibrator

   Manufacturer's name: Capintec

   Manufacturer's model number: CRC 16

   Number of instruments available: 1

3. Instruments used for diagnostic procedures

| Type of Instrument | Manufacturer's Name | Model No. |
|---|---|---|
| Gamma Camera | Picker | Dynacamera 4/15 |

4. Other (e.g., liquid scintillation counter, area monitor, velometer)

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## CALIBRATION OF DOSE CALIBRATOR

A. Sources Used for Linearity Test

(Check as appropriate)

X First elution from new Mo-99/Tc-99m generator

or

X Other* (specify) 50 millicuries will be used for the linearity test as long as radiopharmaceuticals are obtained from Pharmatopes

B. Sources Used for Instrument Accuracy and Constancy Tests

| Radionuclide | Suggested Activity (mCi) | Activity (mCi) | Accuracy |
|---|---|---|---|
| Co-57 | 3-5 | 1-5 mCi | 5% |
| Ba-133 | 0.1-0.5 | .1-.3 mCi | 5% |
| Cs-137 | 0.1-0.2 | .1-.2 mCi | 5% |
| Ra-226 | 1-2 | | |
| | | | |

C. X The procedures described in Section 2 of Appendix D will be used for calibration of the dose calibrator

or

_____. Equivalent procedures are attached.

*For licensees who are not authorized for Mo-99/Tc-99m generators, activity must be equivalent to the highest activity used.

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## CALIBRATION OF SURVEY INSTRUMENTS

Check appropriate items.

X
_____ 1. Survey instruments will be calibrated at least annually and following repair.

__X__ 2. Calibration will be performed at two points on each scale used for radiation protection purposes, i.e., at least up to 1 R/hr.

The two points will be approximately 1/3 and 2/3 of full scale. A survey instrument may be considered properly calibrated when the instrument readings are within ± 10 percent of the calculated or known values for each point checked. Readings within ± 20 percent are considered acceptable if a calibration chart, graph, or response factor is prepared, attached to the instrument, and used to interpret readings to within ± 10 percent. Also, when higher scales are not checked or calibrated, an appropriate precautionary note will be posted on the instrument.

3. Survey instruments will be calibrated

_____ a. By the manufacturer

_____ b. At the licensee's facility

(1) Calibration source

Manufacturer's name _____
Model no. _____
Activity in millicuries _____
or
Exposure rate at a specified distance _____
Accuracy _____
Traceability to primary standard _____

_____ (2) The calibration procedures in Section I of Appendix D will be used

or

_____ (3) The step-by-step procedures, including radiation safety procedures, are attached.

__X__ c. By a consultant or outside firm

(1) Name James Durlacher

(2) Location on-site

(3) Procedures and sources

__X__ have been approved by NRC and are on file in License No. 13-02715-01

_____ have been approved by an Agreement State; a copy of the Agreement State license, the procedures, and a description of the sources are attached, and the consultant's report will contain the information on

_____ the attached "Certificate of Instrument Calibration."
_____ the consultant's reporting form as attached.

_____ are described in the attachment, and the consultant's report will contain the information on

_____ the attached "Certificate of Instrument Calibration."
_____ the consultant's reporting form as attached.

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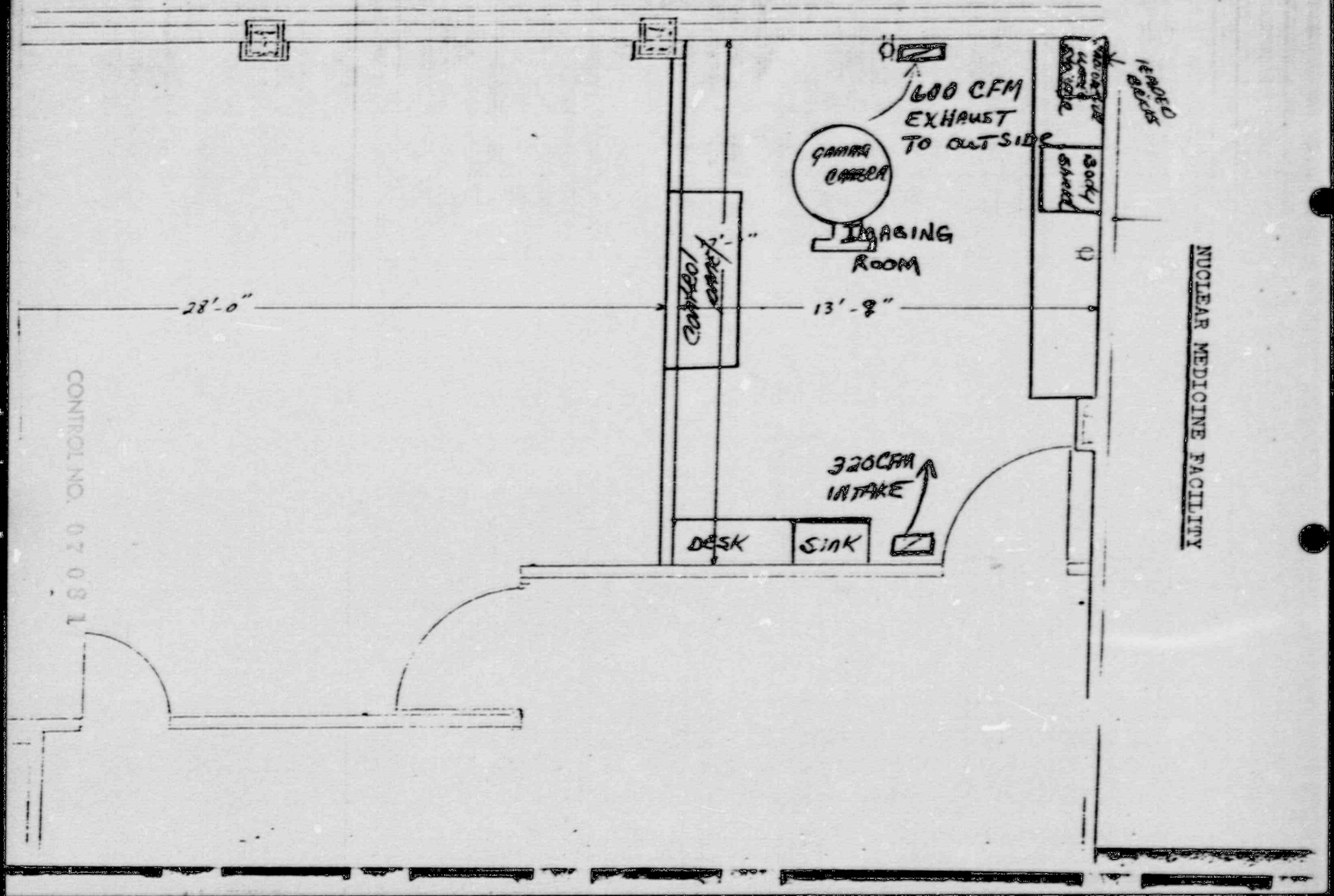
Attached is a diagram of the Nuclear Medicine facility. Work surfaces where unsealed sources of radioactive material are handled are routinely covered with absorbent paper (changed weekly or more often if necessary). Remote handling tongs are used whenever possible for handling and preparing "hot" materials. All radioactive sources are kept in an appropriate lead pig (original shipping container when possible). Lead bricks are used for supplemental shielding.

All radiopharmaceuticals are obtained from Pharmatopes, Inc. in either unit dose or multi-dose form. When necessary, individual doses will be prepared behind a leaded glass face-and-body shield.

Any radioactive waste not returned to Pharmatopes will be stored for decay until it can be disposed of as nonradioactive waste. Stored waste is surveyed periodically with a GM survey meter and is discarded only when the survey meter reading is no greater than background.

Radioactive Iodine-131 will be obtained and utilized only in capsule form for both diagnostic and therapeutic procedures.

HOWARD COMMUNITY HOSPITAL
KOKOMO, INDIANA



PERSONNEL TRAINING PROGRAM

I. Individuals who work in or frequent restricted areas will be instructed in the items specified in 10 CFR 19.12 at the time of initial employment and at least annually thereafter.

This instruction will include:

a. All terms of the license pertinent to radiation safety

b. Areas where radioactive material is used or stored

c. Potential hazards associated with radioactive material

d. Radiological safety procedures appropriate to their respective duties

e. Pertinent NRC regulations

f. Rules and regulations of the license

g. Obligation to report unsafe conditions to the radiation safety officer

h. Appropriate response to emergencies or unsafe conditions

i. Right to be informed of their radiation exposure and bioassay results

j. Locations where the licensee has posted or made available notices, copies of pertinent regulations, and copies of pertinent licenses and license conditions (including applications and applicable correspondence), as required by 10 CFR Part 19

II. Individuals whose duties may require them to work in the vicinity of licensed material will be informed about radiation hazards and appropriate precautions at the time of initial employment and at least annually thereafter.

# INSTRUCTIONS FOR RECEIPT OF

# PACKAGES CONTAINING RADIOACTIVE MATERIAL

The following instructions are to be observed for all incoming shipments of radioactive material:

Examine package for evidence of external damage:

1. If there is no evidence of external damage, take the package to the Nuclear Medicine hot laboratory.

2. If there is evidence of external damage, such as crushing, wetness or water stains, put on plastic gloves and place the package in a plastic bag. Seal the bag and take it to the Nuclear Medicine hot laboratory. Notify the Radiation Safety Officer immediately. Do not let carrier leave the facility until he and his vehicle have been checked for contamination by the Radiation Safety Officer.

Note: Radioactive material is to be ordered only by Nuclear Medicine personnel and packages containing radioactive material are to be opened only by Nuclear Medicine personnel.

Radiation Safety Officer: Pete Scott, M.D.
Office: 453-8413
Home: 846-8780

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# PROCEDURE FOR OPENING PACKAGES CONTAINING RADIOACTIVE MATERIAL

1. Packages containing radioactive material are to be opened only in the hot laboratory by authorized individuals.

2. Individual opening package must wear protective clothing and gloves.

3. Note external condition of package and record. If package is wet or stained, immediately wipe test the package surface with filter paper and forceps. Assay the filter paper with a thin end-window GM tube. If counts above 22,000 dpm, notify Radiation Safety Officer and do not open package. Record wipe test result.

4. All packages must be surveyed for radioactive contamination with a GM meter prior to opening. Record results.

   A. Measure exposure rate at 3' from package surface with thin window GM detector. If this reading is > 10 mR/h, immediately notify the Radiation Safety Officer and do not open the package.

   B. Measure exposure rate at package surface with thin window GM Detector. If this reading is > 200 mR/h, proceed as in Step A, (above).

5. Carefully open outer shipping container and remove the radionuclide. Measure the exposure rate at the surface of the empth shipping container and record result. If this reading is greater than 2x background, then final radioactive container must be wipe tested and the results recorded.

   1) Wipe test with filter paper using forceps. Assay the filter paper with a thin end-window GM tube. If counts above 22,000 dpm, notify Radiation Safety Officer.

6. After package has been surveyed, complete the remaining sections on the package receipt form.

7. If package and/or packing material are contaminated, treat as radioactive waste. If not, obliterate radiation warning labels and discard as regular trash.

Radiation Safety Officer: Pete Scott, M.D.
Office: 453-8413
Home: 846-8780

Item 14

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CONTROL NO. 07 08 11

# AREA SURVEY PROCEDURES

Area surveys will be performed in accordance with Appendix I of the Licensing Guide except that the action levels for removable surface contamination will be those given in Table 2, page 8 of Regulatory Guide 8.23, "Radiation Safety Surveys at Medical Institutions" (Revision 1, January 1981)

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## APPENDIX J

## WASTE DISPOSAL

**Note:** In view of the recent problems with shallow-land burial sites used by commercial waste disposal firms, NRC is encouraging its licensees to reduce the volume of wastes sent to these facilities. Important steps in volume reduction are to segregate radioactive from nonradioactive waste, to hold short-lived radioactive waste for decay in storage, and to release certain materials in the sanitary sewer in accordance with § 20.303 of 10 CFR Part 20.

1. Liquid waste will be disposed of (check as appropriate)

X In the sanitary sewer system in accordance with § 20.303 of 10 CFR Part 20.

____ By commercial waste disposal service (see also Item 4 below).

X Other (specify): stored for decay or returned to Pharmatopes If used again,

2. Mo-99/Tc-99m generators will be (check as appropriate)

X Returned to the manufacturer for disposal.

X Held for decay° until radiation levels, as measured in a low background area with a low-level survey meter and with all shielding removed, have reached background levels. All radiation labels will be removed or obliterated, and the generators will be disposed of as normal trash.°°

____ Disposed of by commercial waste disposal service (see also Item 4 below).

____ Other (specify): ____

3. Other solid waste will be (check as appropriate)

X Held for decay° until radiation levels, as measured in a low background area with a low-level survey meter and with all shielding removed, have reached background levels. All radiation labels will be removed or obliterated, and the waste will be disposed of in normal trash.

____ Disposed of by commercial waste disposal service (see also Item 4 below).

X Other (specify): returned to Pharmatopes

4. The commercial waste disposal service used will be

____ (Name) ____ (City, State)

NRC/Agreement State License No. ____

° Be sure that waste storage areas were described in Item 11 and that they are surveyed periodically (Item 17).

°° These generators may contain long-lived radioisotopic contaminants. Therefore, the generator columns will be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.

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10/31/82

# THERAPEUTIC USE OF SEALED SOURCES

1. Diagram of location of storage of sealed sources is enclosed.

2. All sealed sources are handled only by Dr. Smith or Dr. Blue and are always handled with radium forceps and tongs.

3. Ring badges are worn by Dr. Smith and Dr. Blue whenever the sealed sources are handled. These badges are processed monthly.

4. The sources are transported from the storage area to the place of use in a lead pig with walls 2.5 cm thick. This is carried about 6 inches above the floor because the pig is carried in a container with a long handle.

5. When either Dr. Smith or Dr. Blue remove sealed sources from storage they are signed out on the chart kept in the storage area and the amount taken is recorded. The remaining sources are counted and the total inventory is verified at that time. When the sources are returned to storage after the implant, the amount returned is recorded and inventory is again taken to make sure that all sources are present. Inventory is taken on the 1st of each month if no implant has been done during the preceding month in order to make certain that all sources are present even though they are kept locked up at all times.

6. The patient and room are surveyed with a radiation survey meter immediately following the conclusion of treatment and before the patient is discharged.

7. See attached special nursing instructions.

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10/31/82

INSTRUCTIONS FOR CARE OF PATIENTS CONTAINING SEALED SOURCE IMPLANTS

1. All patients treated with brachytherapy sources will be placed in a private room that has a toilet and the room will be posted with a "CAUTION: RADIATION AREA" sign, a "CAUTION: RADIOACTIVE MATERIALS" sign and a copy of the TEMPORARY IMPLANT RADIATION SAFETY REPORT form. If possible, the same room(s) should be used for all implant patients, thus eliminating the need for detailed exposure rate surveys of adjacent areas for each implant procedure (see item 3 below), and also insuring that properly informed paramedical personnel are attending the patient.

2. Time and distance are important factors in assuring minimal personnel exposures. Radiation exposure is directly proportional to the time spent at a given distance from the patient, while increasing the working distance from the patient decreases the radiation exposure by the square of the change in distance (e.g., doubling the distance decreases the radiation exposure by a factor of 4, tripling the distance decreases the radiation exposure by a factor of 9, etc.).

3. The Radiation Safety Officer is responsible for insuring that the radiation exposure of nurses and other paramedical personnel, visitors and adjacent patients is limited to less than 2 mR in any one hour and 100 mR per admission. The Radiation Safety Officer will perform, or cause to be performed, exposure rate surveys sufficient to document that these exposure levels will not be exceeded. If the same room(s) is(are) used for all implant patients, detailed exposure rate surveys of adjacent areas need only be performed once for each type of treatment procedure.

4. When temporary implants are removed, the patient and all areas occupied by the patient will be surveyed to be sure that all sources have been removed.

5. All hospital personnel attending a patient containing radioactive sealed sources must wear a personnel monitoring device (usually a pocket ionization chamber).

6. Visitors should consist of adults only (over age 18) and should be instructed to remain at least six (6) feet from the patient. Visiting time should be limited to 20-30 minutes, although longer visits may be permitted by the Radiologist/Radiation Safety Officer if necessary. Pregnant visitors are not allowed in the room.

7. Pregnant nurses or other paramedical personnel who are pregnant must not be assigned to a patient containing radioactive sealed sources.

8. Should one of the radiation sources be found outside the patient (on floor, in bed linen, in bedpan, etc.) notify the Radiologist/Radiation Safety Officer immediately. Do not pick up the source with your fingers. Use long forceps and put it in the corner of the room or in the shielded container provided.

9. In cases involving the uterus, cervix, or other pelvic organs, the patient may be permitted to use a bedpan. It should be remembered, however, that the sources can be expelled during defecation and the bedpan must be

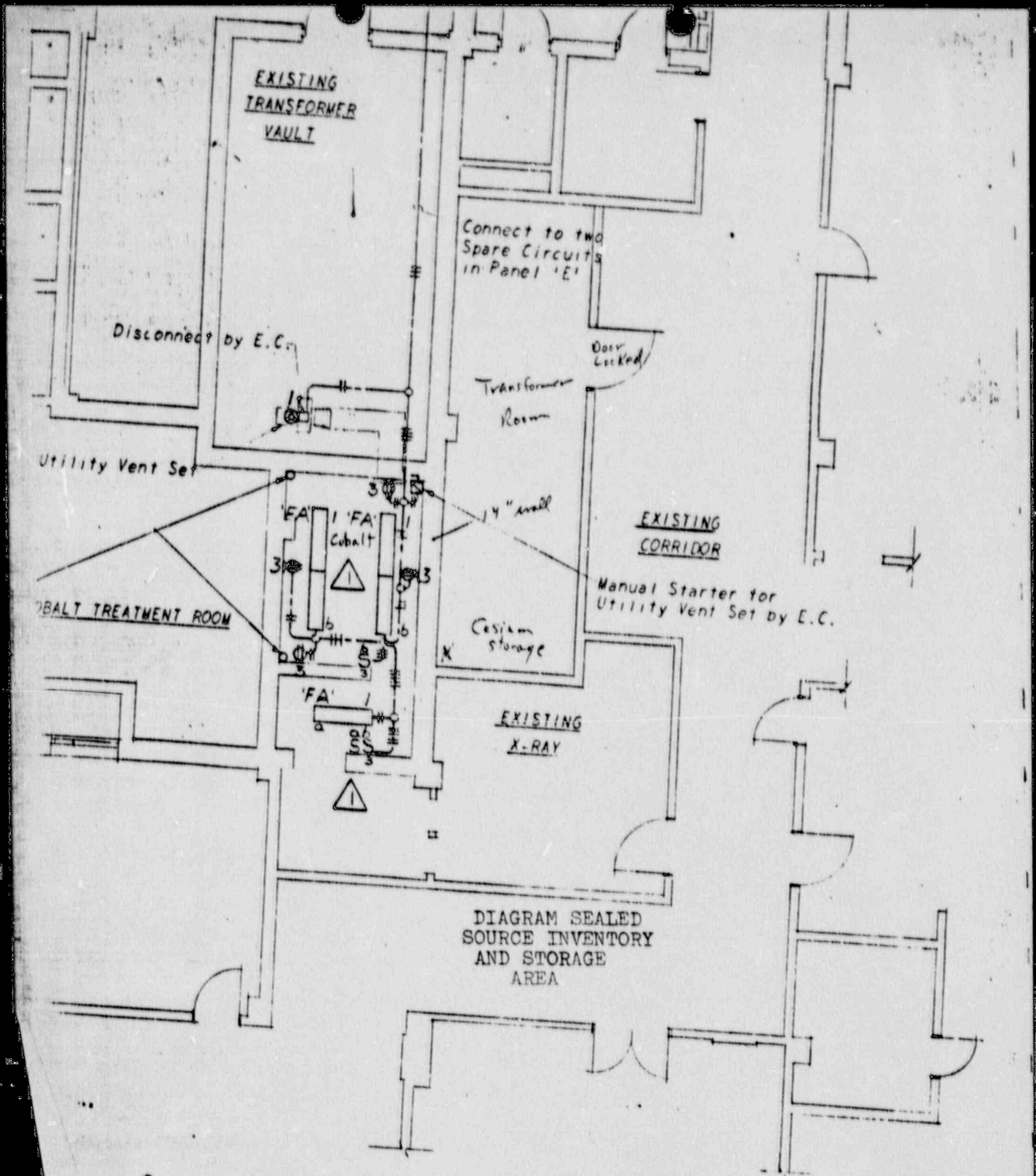
carefully checked after use to be sure the applicator or a source has not been expelled.

10. Bed bath given by the nurse should be omitted while the sources are in place.

11. All linen, gowns, dressings, etc. must remain in the room until checked with a radiation survey meter to ensure that no dislodged sources are inadvertently removed.

12. Should the patient expire during the therapy procedure, the Radiologist/ Radiation Safety Officer must be notified immediately.

13. Special restrictions may be noted in the patient's chart. The Radiation Safety Officer should be contacted to answer any questions about the care of these patients in regard to radiation safety.




Cesium is in lead wells inside a locked box surrounded by extra steel bricks.

# TEMPORARY IMPLANT RADIATION SAFETY REPORT*

PATIENT'S NAME _____ ROOM NUMBER _____

RADIONUCLIDE _____ TOTAL ACTIVITY _____

DATE AND TIME OF IMPLANT _____

## INITIAL SURVEY DATA

DATE _____ TIME _____ SURVEYOR _____

| LOCATION | EXPOSURE RATE (MR/H) |
|---|---|
| 1. @ 1 METER FROM PATIENT | _____ |
| 2. @ 6 FEET FROM PATIENT | _____ |
| 3. @ BEDSIDE | _____ |
| 4. @ 18" FROM WALL IN ADJACENT ROOMS | (A) _____ |
| | (B) _____ |
| | (C) _____ |
| | (D) _____ |
| 5. @ 18" FROM FLOOR ABOVE | _____ |
| 6. @ 6" FROM FLOOR BELOW | _____ |

## SPECIAL NURSING INSTRUCTIONS

1. THE PATIENT MUST BE CONFINED TO THIS ROOM.
2. HOSPITAL PERSONNEL ENTERING THE ROOM MUST WEAR A POCKET DOSIMETER.
3. PREGNANT NURSES ARE NOT TO BE ASSIGNED TO THIS PATIENT.
4. THERE ARE TO BE NO VISITORS WHO ARE PREGNANT OR UNDER 18 YEARS OF AGE. OTHER VISITORS ARE LIMITED TO 30 MINUTES PER DAY AND MUST STAY AT LEAST 6 FEET FROM THE PATIENT.
5. SHOULD A RADIOACTIVE SOURCE BE FOUND OUTSIDE THE PATIENT, NOTIFY THE RADIATION SAFETY OFFICER IMMEDIATELY.
6. ALL LINENS, GOWNS, DRESSINGS, ETC. MUST REMAIN IN ROOM AND NO CLEANUP STARTED UNTIL ALL SEALED SOURCES ARE ACCOUNTED FOR BY RADIOTHERAPY.

## FINAL SURVEY DATA

DATE _____ TIME _____

| LOCATION | EXPOSURE RATE (MR/H) |
|---|---|
| 1. @ 1 METER FROM PATIENT | _____ |

ALL SOURCES ACCOUNTED FOR? YES/NO IF NO, DOCUMENT FOLLOWUP.

* THIS FORM MUST BE POSTED ON THE DOOR TO THE ROOM OF A PATIENT CONTAINING TEMPORARY RADIOACTIVE SEALED SOURCE IMPLANTS.

PROCEDURES AND PRECAUTIONS FOR USE OF XENON-133

1. The Xenon-133 as gas or dissolved in saline is obtained in precalibrated unit dose form from an approved commercial supplier and all patient doses are calibrated immediately prior to administration in an ionization chamber dose calibrator.

2. Ventilation in the imaging room is shown on the attached diagram. The exhaust from the room is 600 CFM through a ceiling vent ducted directly to the outside. With an air intake of 320 CFM, the room is maintained at a negative pressure with no recirculation. The exhaust rate is checked semi-annually by our consulting physicist.

3. The Xenon-133 is stored prior to administration in the imaging room in the lead shipping container. The Xenon-133 is administered to the patient in the imaging room using an Atomic Products Corporation Model 130-330 Xenon Delivery System and Model 127-313 Xenon Gas Trap. Based on the 600 CFM exhaust rate through the ceiling vent, the total air movement through this vent is $4.05 \times 10^{10}$ cubic centimeters during a 40 hour working week. Assuming a 20% leakage rate, up to 2025 millicuries can be continuously stored and handled in this room without exceeding the occupational MPC (air) of $10^{-6}$ uCi/cc. This is actually a conservative estimate since no account is made of the fact that the exhaust system is operational 24 hours a day, not just during the daily 8 hour occupational exposure period.

4. The total air movement through the ceiling vent during a 168 hour week is $1.82 \times 10^{11}$ cubic centimeters. Assuming an average administered patient dose of 20 millicuries, up to an average of 12-13 patient studies per week can be performed in this room without exceeding the nonoccupational MPC (air) of $3 \times 10^{-7}$ uCi/cc.

5. Although advertised as a lifetime trap, the continued efficiency of the Atomic Products trap is checked periodically by collecting the trap exhaust air in a bag and checking the bag with the gamma camera and/or the GM survey meter. In the event that the trap fails, the charcoal cartridges will be treated as contaminated solid waste.

6. In the event that there is an accidental release of a full patient dose of Xenon-133 into the imaging room, the patient and staff will vacate the imaging room for approximately 15 minutes. The 15 minutes allows for 5 air changes as follows:

   room volume = 1880 cubic feet

   ventilation rate = 600 CFM

   thus, time for one air change = 1880/600 = 3.1 minutes

   Five air changes would thus require approximately 15 minutes. This should be more than sufficient since most of the Xenon would be exhausted in the first couple of air turnovers. The room would be surveyed upon re-entry and the background checked on the gamma camera in order to verify that no detectable Xenon-133 remains.

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10/31/82

CONTROL NO. 07081