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 Materials 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

MADISON GENERAL HOSPITAL
202 S. PARK STREET
MADISON, WI 53715

TELEPHONE NO.: AREA CODE ( 608 ) 267 - 6090

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

SAME

2. PERSON TO CONTACT REGARDING THIS APPLICATION

JOHN S. EDWARDS, M.D.

TELEPHONE NO.: AREA CODE ( 608 ) 267 - 6090

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

a. ☐ NEW LICENSE
b. ☐ AMENDMENT TO LICENSE NO.
c. ☒ RENEWAL OF LICENSE NO. 48-00395-02

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

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.)*

JOHN S. EDWARDS, M.D.
DIRECTOR, NUCLEAR RADIOLOGY

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 | X | 3 mCi. |
| 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 mCi. |
| 10 CFR 35.100, SCHEDULE A, GROUP IV | X | AS NEEDED |
| 10 CFR 35.100, SCHEDULE A, GROUP V | X | AS NEEDED |
| 10 CFR 35.100, SCHEDULE A, GROUP VI | | |

| ADDITIONAL ITEMS: | MARK ITEMS DESIRED "X" | MAXIMUM POSSESSION LIMITS *(In millicuries)* |
|---|---|---|
| IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM | X | 100 |
| PHOSPHORUS-32 AS SOLUBLE PHOSPHATE FOR TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA AND BONE METASTASES | X | 30 |
| PHOSPHORUS-32 AS COLLOIDAL CHROMIC PHOSPHATE FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS. | X | 25 |
| GOLD-198 AS COLLOID FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS. | X | 300 |
| IODINE-131 AS IODIDE FOR TREATMENT OF THYROID CARCINOMA | X | 200 |
| XENON-133 AS GAS OR GAS IN SALINE FOR BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES. | X | 500 |

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 |
|---|---|---|---|
| | | | |

Applicant MGH
Check No. 45053
Amount/Fee Category $350
Type of Fee NRC Ren
Date Check Rec'd 5/21/85
Received By [illegible]

NRC FORM 313M

8506100108 850520
REG3 LIC30
48-00395-02 PDR

CONTROL NO. 78795

## 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. _____ Date: _____

**7. MEDICAL ISOTOPES COMMITTEE**

| | |
|---|---|
| | Names and Specialties Attached; and |
| X | Duties as in Appendix B; or |
| | Equivalent Duties Attached |

*(Check One)*

**8. TRAINING AND EXPERIENCE**

| | |
|---|---|
| X | Supplements A & B Attached for Each Individual User; and |
| | Supplement A Attached for RSO. |

**9. INSTRUMENTATION** *(Check One)*

| | |
|---|---|
| | Appendix C Form Attached; or |
| X | List by Name and Model Number |

**10. CALIBRATION OF INSTRUMENTS**

| | |
|---|---|
| | Appendix D Procedures Followed for Survey Instruments; or |
| X | Equivalent Procedures Attached; and |
| | Appendix D Procedures Followed for Dose Calibrator; or |
| X | Equivalent Procedures Attached |

*(Check One)*

*(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)*

| | |
|---|---|
| | Appendix G Rules Followed; or |
| X | 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)*

| | |
|---|---|
| | Appendix J Form Attached; or |
| X | Equivalent Information Attached |

**19. THERAPEUTIC USE OF RADIOPHARMACEUTICALS** *(Check One)*

| | |
|---|---|
| | Appendix K Procedures Followed; or |
| X | Equivalent Procedures Attached |

**20. THERAPEUTIC USE OF SEALED SOURCES**

| | |
|---|---|
| | Detailed Information Attached; and |
| | Appendix L Procedures Followed; or |
| | NOT APPLICABLE Equivalent Procedures Attached |

*(Check One)*

**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 |
| | NOT APPLICABLE |

**23. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b**

| | |
|---|---|
| | Detailed Information Attached |

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## 24. PERSONNEL MONITORING DEVICES

| TYPE (Check appropriate box) | | | SUPPLIER | EXCHANGE FREQUENCY |
|---|---|---|---|---|
| a. WHOLE BODY | | FILM | | |
| | | TLD | | |
| | | OTHER (Specify) | | |
| b. FINGER | | FILM | | |
| | | TLD | | |
| | | 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 170.21, 10 CFR 170)*

(1) LICENSE FEE CATEGORY

(2) LICENSE FEE ENCLOSED $

b. APPLICANT OR CERTIFYING OFFICIAL *(Signature)*

(1) NAME *(Type or Print)*

(2) TITLE

c. DATE

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## 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.

RENEWAL APPLICATION
LICENSE NO. 48-00395-02

ATTACHMENT I

January 31, 1984

Mr. Darrel Wiedeman
United States Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

RE: 48-00395-02

Dear Mr. Wiedeman:

Consistent with the requirements of 10CFR20.402, this letter is to notify the USNRC that there has been an inadvertant loss of byproduct material controlled under the above license. We do not feel that the material is in such quantity nor in such circumstance that there exists a significant hazard to the public. Nonetheless, we feel that it is important to notify Region III of the incident.

The byproduct material consisted of 12 mCi of Am-241 as a sealed source. The source was manufactured by Amersham Corporation and was denoted as Model AMC-24, Searle Analytic Anatomical Marker Model SS-10244. The device was used as part of a Siemens Corporation gamma-camera. The enclosed letter adequately describes the circumstances leading up to the discovery of the loss.

At this time we do not know the exact circumstances under which the source was lost, but presume that it fell from the "wand" sometime during the last four years. In addition, the source was most probably disposed of in the normal trash and thus buried in the clean landfill used by the City of Madison. As the source was sealed, the principal hazard would be from photon emission, namely the 59 keV X-ray. The anticipated dose rate at 1 m would be less than 0.15 mrad/hr (see attached calculation) and thus the weekly dose rate in an unrestricted area would be less than 100 mrad. At this time we do not feel any further action is needed, but we are going to notify the gamma camera manufacture concerning the poor design of the "wand" mounting. We do not anticipate replacing the source as exam procedures no longer require the anatomical marker.

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5 pp.

CONTROL NO. 08795

Madison General Hospital, 202 South Park Street, Madison, Wisconsin 53715 608/267-6000

If any further information is needed, please feel free to call upon us at any time. Your attention in this matter is most appreciated.

Sincerely,

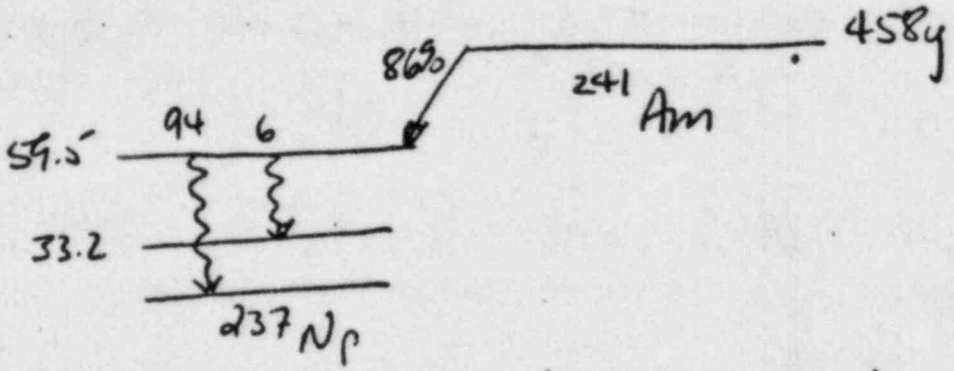
Larry Kleinsteiber
Vice-President

Sincerely,

Paul M. DeLuca, Jr., Ph.D.
Consultant Physicist

/chl

29-Jan-84 Attachment A.




L. X-ray: 36γ : Table of Isotopes, Lederer, Hollander, and Perlman (Wiley & Sons, 1967)

also: $\frac{\mu_{en}}{\rho} = 0.0328 \frac{cm^2}{g}$ : Radiat in Dosimetry I, edts. Attix, Roesch and Tochlin (Academic Pun, 1968).

thus: $\frac{k}{\rho}(rad\,cm^2) = \frac{\mu_{en}}{\rho} \cdot E_\gamma$

$$= 1.97 \cdot 10^{-3} \frac{MeV cm^2}{g} * 1.602 \cdot 10^{-8} \frac{rad\,g}{MeV}$$

$$\boxed{\frac{k}{\rho} = 3.15 \cdot 10^{-11} rad\,cm^2}$$

and: $\Gamma = \frac{3.7 \cdot 10^{+7} * 0.36}{4\pi (100)^2} * 3.15 \cdot 10^{-11} * 36\gamma * \gamma^3$

$= 0.012 \frac{mrem}{hr}$ at 1m and 1 mCi

$\therefore$ $\boxed{k = 0.144 \frac{mrem}{hr}}$ @ 1m and 12 mCi

Department of Radiology
January 31, 1984

Paul DeLuca, Ph.D.
U.W. - Madison
Physical Science Lab
3725 Schneider Dr., Rt. 4
Stoughton, WI 53589

Dear Dr. DeLuca:

The anatomical marker was purchased with a Siemens Corporation (at that time Searle Analytic) large field of view camera approximately ten years ago.

The anatomical marker has not worked properly and has not been in service for the past 3-4 years. The wand and the plastic hand control were frequently bent and broken when it was caught as the whole body table was brought over the head of the camera. At one time, the plastic hand control broke and would not hold the metal wand. I placed the metal wand (assuming it contained the Americium-241) behind the lead bricks surrounding the generator until the time the serviceman could put it back on the hand control. I did not check the wand for the Americium at that time. The serviceman, on a routine maintenance visit, placed the metal wand back on the hand control. The anatomical marker was <u>not</u> put back in service, nor was it checked for the Americium.

In December, I decided that as long as the unit was under a maintenance agreement, the anatomical marker should be in working order, On January 16, the serviceman came to put it back into service. I was aware that a wipe test of the source would be necessary when it was put back in service. It was at this time (when he was working on it) that it became apparent that the source was missing.

In my opinion, the source fell out and was swept into the garbage. This could have happened anytime over the past 3-4 years, perhaps any one of the many times the serviceman straightened the wand or when it was caught on the whole body table.

The department is monitored once a week and the camera is flooded daily without a collimator. I believe the source would have been found if

it had stayed in the department for any length of time. The department was monitored with a survey meter when it became obvious that it was in the wand.

12 millicuries + 15% Americium-241-sealed source (Amersham Corporation, model AMC-24).

Searle Analytic Anatomical Marker Model SS-10244.

Sincerely,

Karen Andrusco

Karen Andrusco, R.T.R., R.T.N.
Ultrasound/Nuclear Medicine Section

/chl

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

MAR 27 1984

Madison General Hospital
ATTN: Mr. Richard Zlinski
Radiology Department
Manager
202 S. Park Street
Madison, WI 53715

License No. 48-00395-02

Gentlemen:

This refers to the special safety inspection conducted by Mr. R. E. Burgin of this office on March 14, 1984, of activities authorized by NRC Byproduct Material License No. 48-00395-02 and to the discussion of our findings with you and Ms. Karen Andrusco at the conclusion of the inspection.

This special inspection was an examination of activities conducted under your license as they relate to the loss of byproduct material (a nominal 12 millicurie americium-241 anatomical marker) reported to us in letter dated January 31, 1984.

During this inspection, certain of your activities appeared to be in non-compliance with NRC requirements, as described in the enclosed Appendix. The inspection showed that action had been taken to correct the identified noncompliance and to prevent recurrence. Consequently, no reply to this noncompliance is required and we have no further questions regarding this matter at this time.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

D. G. Wiedeman

D. G. Wiedeman, Chief
Materials Radiation Protection
Section 1

Enclosure: Appendix,
Notice of Violation

8404030217
1p.

cc w/encl:
DMB/Document Control Desk (RIDS)

CONTROL NO. [illegible]

Appendix

NOTICE OF VIOLATION

Madison General Hospital License No. 48-00395-02

As a result of the special inspection conducted on March 14, 1984, and in accordance with the NRC Enforcement Policy, 47 FR 9987 (March 9, 1982), the following violation was identified:

10 CFR 20.207 states that licensed material shall be secured from unauthorized removal from its place of storage or shall be tended under the constant surveillance and immediate control of the licensee.

Contrary to the above, you failed to maintain control over byproduct material covered under your NRC license. Specifically, you lost control over a nominal 12 millicurie sealed source (Am-241 anatomical marker) which you reported as lost in letter dated January 31, 1984.

This is a Severity Level IV violation (Supplement IV).

The inspection showed that action had been taken to correct the identified item of noncompliance and to prevent recurrence. Consequently, no reply to this item of noncompliance is required and we have no further questions regarding this matter.

MAR 27 1984
Dated

D. G. Wiedeman, Chief
Materials Radiation Protection
Section 1

8404030221
7 pp.

ATTACHMENT II

MADISON GENERAL HOSPITAL

MEDICAL ISOTOPE COMMITTEE

1. Dr. John Edwards, Radiologist, Director of Nuclear Radiology
2. Karen Andrusco, R.T.N., Supervisor of Nuclear Radiology
3. Mr. Larry Kleinsteiber, Vice President, Madison General Hospital
4. Mr. Mark Deur, Department Manager, Medical Imaging, Madison General Hospital.
5. Mr. Carl Kreienkamp, Chief Security, Madison General Hospital
6. Ms. Margaret Eklof, Section Head, Special Chemistry, Madison General Hospital
7. Dr. Edward Ehrlich, Endocrine Research, Madison General Hospital
8. Dr. Paul M. DeLuca, Jr., Consulting Physicist, University of Wisconsin-Madison.

RADIATION DETECTION INSTRUMENTS ATTACHMENT III

CONTROL NO. 7879

| TYPE OF INSTRUMENTS | AVAILABLE | RADIATION DETECTED | SENSITIVITY RANGE | WINDOW THICKNESS | USE | LOCATION |
|---|---|---|---|---|---|---|
| Pho-Gamma Camera Searle - Mo. No. 80030 | 1 | Gamma | 80 Kev | 11" x 1" Sodium Iodide (Thallium Activated) | Imaging | Radioisotope Department |
| Eberline Geiger Counter Model 120 | 1 | Gamma & Beta | 0-50 MR/hr of radium equivalent radiation | HP-210A1 GM Pancake 1.4-2.0 mg/cm$^2$ HP-270 GM Probe | Monitoring & Surveying | Radioisotope Department |
| Eberline Radiation Monitor Model RM-20-1 | 1 | Gamma & Beta | 0-500K Cnts | Model 270 GM Probe | Monitoring | Radioisotope Department |
| Capintec CRC-5R | 1 | Gamma | 0-2,000 mCi. | Ionization Chamber Deepwell, Thin Aluminum Insert Gas-Filled | Measuring | Radioisotope Department |
| Searle 8725 Well Counter | 1 | Gamma | | 1/8" | Measuring (Not using) | Storage |
| Scintillation Well Counter (Picker) 2804 E | 1 | Gamma | 25 Kev- 2.5 Mev | NaI(Tl) 2 "D x 2" | Measuring (Not using) | Radioisotope Department |
| Spectroscaler III A (Picker) 1383 B 279 Probe 2830 A 753 | 1 | Gamma | 25 Kev 2.5 Mev | 2 "D x 2" NaI (Tl) | Uptake | Radioisotope Department |
| Liquid Scintillation Counter M 3330 Tri-Carb - Packard | 1 | Beta | | | Measuring | Endocrine Lab |

RADIATION DETECTION INSTRUMENTS

| TYPE OF INSTRUMENTS | AVAILABLE | RADIATION DETECTED | SENSITIVITY RANGE | WINDOW THICKNESS | USE | LOCATION |
|---|---|---|---|---|---|---|
| Radio-Chromatogram Scanner Model 7201 Packard | 1 | | | | Measuring | Endocrine Research Lab |
| LFOV Pho-Gamma Camera Searle Mo. No. 6413 Total Body Table Mo. No. 3199 Micro-Dot Mo. No. 3132 | 1 | Gamma | 50 Kev-680 Kev | 15¼" x ½" Sodium Iodide (Thallium Activated) | Imaging | Radioisotope Department |
| Multiwell Gamma Counter Isodata Model 20/10 | 1 | Gamma | | 1.25" NaI(Tl) | Measuring | New Lab |
| Survey Meter Nucleus, Oakridge, Tenn. Mo. No. L | 1 | Gamma & Beta | 0-50 MR/hr | | Monitoring & Surveying | New Lab |
| Nuclear Chicago Model 2592 Ionization Chamber | 1 | Gamma & Beta | 10 Kev-1 Mev | Model 2593 Probe and Model 2594 Probe | Monitoring & Surveying | Radioisotope Department |

CONTROL NO. 2 8 7 9 5

# CALIBRATION AND MOLY ASSAY FOR CAPINTEC DOSE CALIBRATOR

DO NOT TURN OFF: If SCALER is BLINKING, increase range until blinking stops.

DAILY CALIBRATION:

1. 2000 mCi. range BUTTON: Zero (adjust if necessary with Zero knob)
2. N/A range BUTTON: Test 150 $\pm$ 3
3. 200 uCi. range BUTTON: BKG (adjust if necessary with BKG knob)
4. Cs 137 calibration:

| BUTTON | PENTIOMETER | RANGE | READING |
|---|---|---|---|
| Other | 950 | 2000 uCi. | |
| " | 220 | " | |
| " | 50 | " | |
| Tc99m | N/A | " | |
| I131 | " | " | |
| I123 | " | " | |
| Xe133 | " | " | |
| Ga67 | " | " | |
| TL201 | " | " | |
| In11 | " | " | |

5. Compare results with previous readings.

MOLY ASSAY:

BUTTON: Tc99m RANGE: 200 uCi.

1. Insert empty Moly Canister. RECORD _____
2. Insert Moly Canister with Tc99m vial.

   BUTTON: Moly Assay RECORD _____
3. Tc99m Assay: Insert Tc99m vial.

   BUTTON: Tc99m RANGE: 2000 mCi. RECORD _____
4. Molly Assay (2) - BKG (1) x 5 = Activity of Moly.
5. $\frac{\text{Moly Activity (4) uCi. } (\times 10^4)}{\text{Tc99m Activity (3) mCi. } (\times 10^7)}$ = moly contamination.

   EXAMPLE: $\frac{9.1 \text{ uCi.}}{100 \text{ mCi.}} = \frac{9.4 \times 10^4}{100 \times 10^7} = .094 \times 10^{-3}$

YEARLY:

Send dose calibrator to Capintec for calibration.

ATTACHMENT V

ITEM 8

RADIOACTIVE MATERIALS:

A. All radioactive waste is handled in a similar fashion as outlined below:

1. Long-lived radionuclides: T 1/2 > 8 day

a. Materials are separated into combustable and non-combustable types.

b. Materials are stored for decay in the 60Co teletherapy room (unused). This is a controlled area. Radiation levels are kept below 10 mR/hr at 1 m.

c. When the radiation level is below 0.02 mR/hr (measured in contact with a thin window pancake probe), these materials are disposed of by incineration (combustable) or by disposal to normal waste (non-combustable).

2. Short-lived radionuclides:

a. Materials are separated into combustable and non-combustable.

b. Non-combustable items are removed to the 60Co room where they are held for decay.

c. Combustable items are retained at the origin and held for decay.

d. When the radiation levels are below 0.02 mR/hr (measured in contact with a thin window pancake probe), the materials are disposed of by incineration or normal solid waste disposal.

e. Liquids are either held for decay or diluted until concentrations are below the levels specified in paragraph 30.71, Schedule A of Title 10, i.e.

H-3: 3xE-2 uCi/ml or 3xE-2 uCi/gm
I-125: 2xE-5 uCi/ml or 2xE-5 uCi/gm

These fluids or solids are then disposed of through normal waste.

# NUCLEAR MEDICINE

## RADIATION ISOLATION NURSING INSTRUCTIONS

1. If pregnant, do not attend this patient.
2. All visitors must comply with visitation restrictions listed by the attending radiologist.
3. The patient will receive only disposable food trays which will be saved in the room.
4. Waste papers and soiled linen are to be placed in appropriate containers and saved in the room.
5. No biological samples (other than blood) are to be removed from the room without approval by the Nuclear Medicine Health Physicist.
6. The room is <u>not</u> to be cleaned during the radiation isolation period.
7. When the patient has reached a permissible radiation level, the Nuclear Medicine Health Physicist will remove the Radiation Isolation Precautions and monitor the room prior to cleaning.
8. Avoid all unnecessary contact with the patient, but carry out normal nursing care as quickly as possible.