Community Comprehensive Cancer Center

Camden-Clark Memorial Hospital

For Your Lifetime

800 Garfield Avenue
P.O. Box 718
Parkersburg, WV 26102
(304) 424-2256

Q-8

FAX

Date: 2-9-04

Number of pages including cover sheet 11

TO: U.S.N.R.C. (attn. Shirley)

FROM: Ashford Broadwater III

Telephone:

Fax Number: 610-337-5269

Telephone: 304-424-2903

Fax Number:

COMMENTS: Subject: Application for Material License - Additional Information
Docket No. 03003390
Control No. 136193
License No. 47-09772-02

136193

NMSS/RGN1 MATERIALS-002

CAMDEN-CLARK MEMORIAL HOSPITAL
COMMUNITY COMPREHENSIVE CANCER CENTER PROCEDURE

TITLE: Brachytherapy Patient Shielding

WRITTEN BY: Venkata Kanumalla, Ph.D.

EFFECTIVE DATE: 07/01/97

PURPOSE: To provide a procedure for the placement of mobile lead shields at the bedside df a brachytherapy patient.

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Procedure:

1. Mobile lead shields shall be stored on the 3 North nursing unit (two shields) and in the Isotope Storage room within the Department of Radiation Oncology (two shields).

2. A lead shield shall be placed at the head of the patient's bed (between headboard of bed and wall) and at the side of the patient's bed facing the entrance into the room. These lead shields shall be positioned so as to maintain an exposure rate in the adjacent room of less than 2 mR/hr and an exposure rate at the entrance into the room (doorway) of less than 2 mR/hr. Radiation measurements will be taken to confirm these exposure levels and documented on the "Nursing Instructions" form. Nursing staff will be instructed to leave lead shields in position set by radiation oncology staff.

3. A "safeline" shall be placed on the floor using duct tape (with the words "DO NOT CROSS" written on it). Yellow tape with radioactive material warning printed on it will also be placed along side the duct tape. The radiation exposure rate at this safeline will be less than 2 mR/hr. The safeline will indicate to visitors a safe distance from the patient which they are to maintain.

4. Visitors will be instructed to stand behind the safeline at all times.

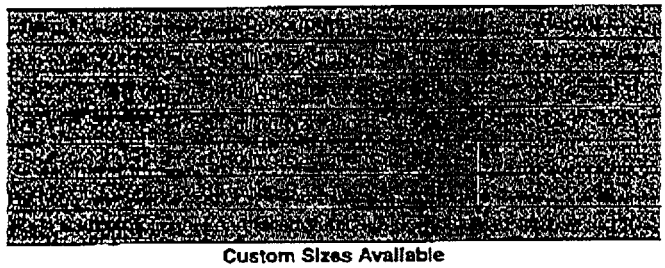
Formulated: 9/25/96
Reviewed: 07/01/97, 8/99, 9/02
Revised: 02/07/05

ROLLING RADIATION SHIELD

The Fixed Rolling Radiation Shields are made of 1" thick sheet lead. The shield is mounted on a base that has four 6" diameter swivel locking ball bearing casters which provide easy mobility. The shield also has handles on each end and side. Optional lead filled vertical side posts.

Specifications

Lead Size: 36" W x 24" H x 1" T
Overall Size: 40 1/2" W x 40" to 56" H x 24" D
Base Height: 10 1/2"
Casters: Four 6" dia. swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 480 lbs. - 500 lbs



Custom Sizes Available

CAMDEN-CLARK MEMORIAL HOSPITAL
COMMUNITY COMPREHENSIVE CANCER CENTER PROCEDURE

TITLE: Dislodged Brachytherapy Source(s)

WRITTEN BY: Venkata Kanumalla, Ph.D.

EFFECTIVE DATE: 07/01/97

PURPOSE: To establish and maintain a procedure for dealing with a brachytherapy source which has become dislodged/separated from a patient during a brachytherapy procedure.

Procedure:

1. In the event a brachytherapy source becomes dislodged or separated from a patient during a brachytherapy procedure, NEVER attempt to pick up the radioactive sources with the bare hand(s). Only long-handled forceps should be used to retrieve the source(s).

2. The nurse in charge shall place any dislodged or separated source(s) into the portable lead container (referred to as a "pig") which is kept in the patient's room.

3. Once the source(s) has been retrieved and secured in the pig, the Radiation Safety Officer (RSO) and the supervising Radiation Oncologist are to be notified.

4. The Radiation Oncologist and RSO shall be on the scene within reasonable driving time after being notified.

5. The RSO will survey the patient room and start an investigation of the incident.

6. The final incident report will be discussed/reviewed in the ROQIC meeting and the Radiation Safety Committee meeting in order to identify means by which to prevent similar incidents in the future.

Formulated: 9/96
Reviewed: 7/1/97, 8/99, 9/02
Revised: 1/27/05

CAMDEN-CLARK MEMORIAL HOSPITAL
COMMUNITY COMPREHENSIVE CANCER CENTER PROCEDURE

TITLE: Brachytherapy Inpatient Room Survey

WRITTEN BY: Reinnie Leavitt

EFFECTIVE DATE: 01/27/05

PURPOSE: To establish guidelines by which survey measurements will be obtained during inpatient brachytherapy procedures.

Procedure:

1. Once a patient has been admitted and the brachytherapy procedure has been performed, the Medical Physicist or the Medical Dosimetrist will obtain radiation exposure rates for the following unrestricted and restricted areas.

   a. Unrestricted Areas

      1. Hallway
      2. Room # Left
      3. Room # Right
      4. Room # Above
      5. Room # Below

   b. Restricted Areas

      1. Visitor Chair
      2. Patient Rest Room
      3. Bedside (Unshielded)
      4. Bedside (Shielded)
      5. Patient Room Door
      6. 1 Meter from Patient Bed

2. All measurements will be clearly documented on the Nursing Instructions and Brachytherapy Patient Room Survey Record Form (see attached).

3. In the event that a measurement/s is found to exceed 2mR/hr, extra shielding will be added until an appropriate reading is obtained. If shielding cannot be added to reduce radiation exposure to acceptable levels, patients will be evacuated from necessary adjacent rooms.

4. Any questions regarding brachytherapy procedures should be directed to the Radiation Safety Officer (RSO) or a Medical Dosimetrist.

Formulated: 1/27/05

Camden-Clark Memorial Hospital Corporation
Renewal of License Number: 47-09772-02

8.5 ITEM 5: RADIOACTIVE MATERIAL

Element and Mass Number	Chemical/Physical Form	Maximum Amount
Any byproduct material permitted by 10 CFR 35.400	Any brachytherapy sources identified in 10 CFR 35.400 (3M Models 6D6C-CA; 6501-CA; 6502; 6504; 6551. AM CDCT1)	Not to exceed 37 GBq (1Ci)

Iodine 125 seeds used for Prostate Implantation are obtained from Best Industries - Model #2301.
Palladium 103 seeds used for Prostate Implantation are obtained from Best Industries – Model #2335.

These seeds are stored in the Medical Office Building Hot Lab in the individual containers and shipping apparatus provided by Best Industries.

The survey meter used for these sources is:

Ludlum Geiger Counter Model 14C with Ludlum Model 44-9 Alpha, Beta, Gamma Detector (see attached vendor specifications).

8.6 ITEM 5: SEALED SOURCES AND DEVICES

Element and Mass Number	Chemical/Physical Form	Maximum Amount
Cesium 137	Sealed Source (Tech Ops Model No. 773)	5.11 Gbq (165 Millicuries (mCi))

This source is housed in a Gamma Survey Instrument Calibrator (see attached vendor specifications). The Instrument Calibrator is kept in the Medical Office Building Hot Lab.

Please remove Daniel Berkley as the Authorized User for the Sealed Source (Tech Ops Model No. 773) and replace with Chandra Sekar M.D., Radiation Oncologist.

GAMMA SURVEY INSTRUMENT CALIBRATOR

Eliminates the expense, inconvenience and work-time lost when sending such instruments to an outside calibration service.

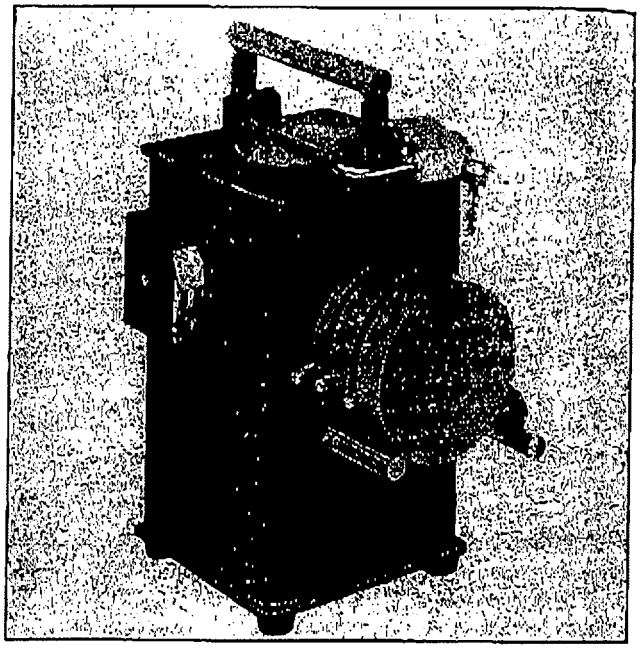
- **Self-contained ^{137}Cs source.**
- **Calibrates instruments with ranges up to 2000 mR/hr.**
- **Calibration traceable to NIST.**
- **Attenuators eliminate repositioning for different scale measurements.**
- **Can be padlocked in closed position for safety.**

This sturdy, easy-to-use device permits the safe, accurate calibration of instruments used for surveying gamma radiation. It enables users of dosage-measuring equipment to perform routine checks at will or as necessary to meet the regulations of the N.R.C. and Agreement States.

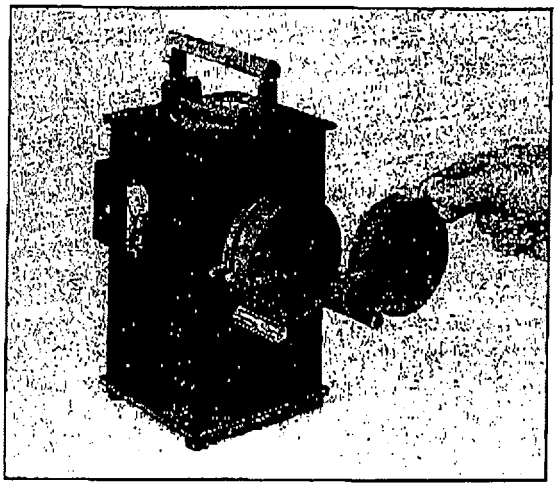
The heavy-duty lead container holds 165 mCi of ^{137}Cs, encapsulated at one end of a control rod. Since ^{137}Cs has a long half-life (29 years), there is no need to calculate a correction factor for at least 1 to 2 years after the instrument is shipped.

The source can be kept in either of two positions: stored or exposed. In the fully-shielded "stored" position, radiation at the container's surface is less than 200 mR/hr; at 1 meter away it is less than 10 mR/hr. In the "exposed" position, the source faces a 36° (horizontal) x 20° (vertical) port at the shield's side. The radiation field can be varied by means of three built-in attenuators (transmission factors 0.25, 0.10 and 0.10). These permit calibration of three meter scales, each at 20% and 80% of full scale, using only one source-to-meter distance measurement. The source is moved from "stored" to "exposed" merely by raising the control rod. For safety, the ^{137}Cs source cannot be removed from its shield, except by the manufacturer.

A built-in tape measure helps determine the distance from the ^{137}Cs source to the instrument being calibrated. A padlock (not included) can be used to prevent unauthorized use of the equipment. A convenient carrying handle is included.



Gamma Survey Instrument Calibrator with three attenuators in place.



Gamma Survey Instrument Calibrator with one attenuator removed from radiation path

SPECIFICATIONS:

Dimensions: 5" x 5" x 8 1/2" H
Weight: 52 lbs

64-773 Gamma Survey Instrument Calibrator.....$5,450.00*

* *An N.R.C. or Agreement State license is required (see page 197). When applying, please designate the source as Technical Operations model 773. A copy of your license must accompany the order.*

HEALTH PHYSICS/ RADIATION MONITORING

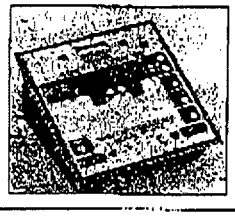
400

See Also...

DELUXE WIPE TEST COUNTER

Designed to help ensure compliance with NRC and Agreement State Regulatory Requirements for Wipe Test Counting.

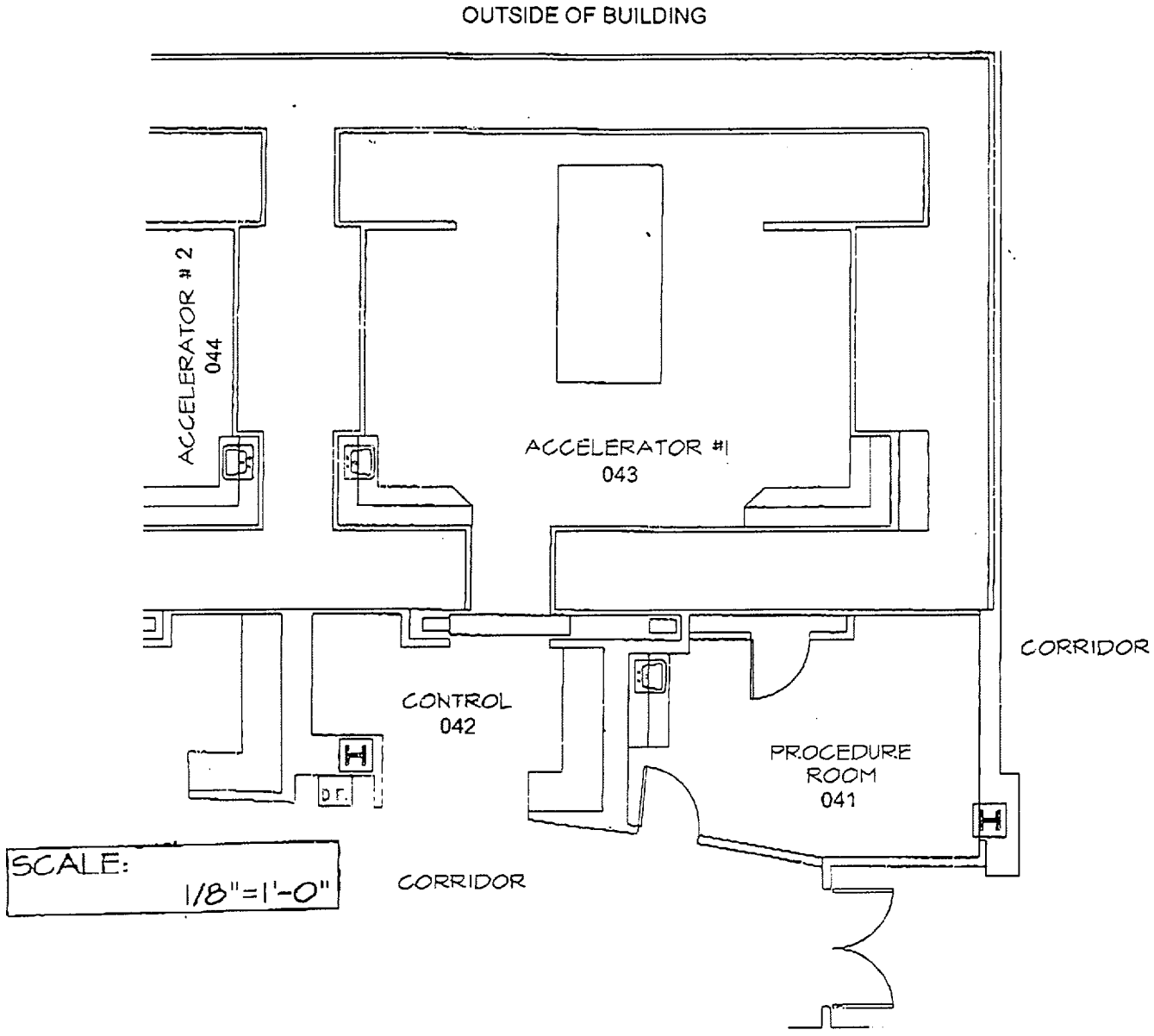
See Nuclear Medicine Section, Page 206.



Camden-Clark Memorial Hospital Corporation
Renewal of License Number: 47-09772-02

8.15 ITEM 9: Facility Diagram

Figure 9.6 – Linac Vault/Used for Gamma Survey Instrument Calibrator



Notes:

1) *Accelerator #1, Room 043, Medical Office Building, is a linac vault shielded for 23MV photons.*

2) *This is the room utilized when working with the Gamma Survey Instrument Calibrator.*

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2/8/2005

US Nuclear Regulatory Commission
King of Prussia, PA

To Whom It May Concern:

This correspondence is to document the acceptability of using a thin window pancake chamber for I-125 and Pd-103 source detection. Camden Clark Memorial Hospital is currently using a thin window Ludlum Model 44-9 for brachytherapy source detection. This is the basic tool when it comes to source detection and recovery in the Operating Room and surrounding areas. The probe has a thin window (1.7 mg/cm2, mica) and can readily detect the sources used in prostate implant. The sources we use are between 0.1 mCi and 0.5 mCi. The Geiger pancake probe can easily detect the low energy x-rays coming from these isotopes. The probe can detect Beta's and Alpha's from product brochure (enclosed). The brachytherapy sources are heavily filters and the 12KeV to 30KeV x-rays are easily identified by this detector. Most surveys are done in close proximity to the item such as the OR floor (one foot) to bloody urine (six inches). Trash and linen are measured on contact. I have done about 150 of these cases and have had good success with source accountability in the OR using a Geiger pancake probe. While the NaI (Tl) probe may be more efficient it has a longer dead time given the activity of these sources.

If you have any questions or comments, please do not hesitate to contact me.

Sincerely,

Daniel A. Berkley, RSO

LUDLUM MODEL 44-9
Alpha, Beta, Gamma Detector

MODEL 44-9 Alpha, Beta, Gamma Detector

1. GENERAL

The Model 44-9 GM (Pancake) Detector will detect Alpha, Beta, and Gamma radiation. Its size and shape provide easy handling for surveying or personnel monitoring. The detector is energy dependent, over responding by a factor of six in the 60 keV - 100 keV range when normalized to ^{137}Cs.

The thin mica window is protected by a 79% open stainless steel screen. The GM tube can be easily removed for replacement if necessary.

The GM detector operates between 850 - 1000 volts. The tube manufacturer recommends operation at approximately 900V. The recommended instrument input sensitivity is approximately 30 mV or higher to prevent the detector from double pulsing.

The GM tube face can rupture above 8000 feet altitude pressure. Consequently, detectors carried in unpressurized aircraft above this altitude would be subject to failure.

The Model 44-9 will operate with any Ludlum instruments or equivalent instruments that provide 900 VDC and an input sensitivity of approximately 30 mV or higher.

2. SPECIFICATIONS

DETECTOR: Pancake type halogen quenched G-M
WINDOW: 1.7 ± 0.3 mg/cm² mica
WINDOW AREA:
Active - 15 cm²
Open - 12 cm²
EFFICIENCY(2pi geometry): Typically 10%-^{14}C; 45%-$^{90}Sr/^{90}Y$; 38%-^{99}Tc; 65%-^{32}P; 30%-^{239}Pu
SENSITIVITY: Typically 3300 cpm/mR/hr (^{137}Cs *gamma*)
ENERGY RESPONSE: Energy dependant
DEAD TIME: Typically 80µs
COMPATIBLE INSTRUMENTS: General purpose survey meters, ratemeters, and scalers
OPERATING VOLTAGE: 900 volts
CONNECTOR: Series "C" (*others available*)