WING MEMORIAL HOSPITAL

MS 16
KO

COMMUNITY
HEALTH
CENTER

Wright Street
Palmer, Ma. 01069
413/283-7651

September 9, 1985
License No. 20-15280-01
Mail Control No.
104278

United States
Nuclear Regulatory Commission

Region 1
631 Park Avenue
King of Prussia, Penn. 19406

Dear Sirs;

In response to our telephone conversation on August 29, 1985, find the enclosed information on procedures, standards and frequency of calibration of survey meters.

We are continuing action on the preceptor statements, supplements A & B for Dr. Nicholas Spencer.

Respectfully submitted:

Richard A. Scheffer

Mr. Richard Scheffer
President
Wing Memorial Hospital Corp.
Wright Street
Palmer, Mass. 01069

04278

"OFFICIAL RECORD COPY"

ML10

SEP 24 1985

WITH SATELLITE
HEALTH CENTERS
AT

10 South Main Street
Belchertown, Ma. 01007
413/323-5118

121 Main Street
Monson, Ma. 01057
413/267-5181

3 Crane Park Drive
Wilbraham, Ma. 01095
413/596-3455

WING MEMORIAL HOSPITAL

CODE NO.	PAGE 1 OF 3
EFFECTIVE DATE SEPTEMBER 9, 1985	
SUPERSEDES	
PERSONNEL APPROVAL	
HOSPITAL ADMINISTRATOR	

☐ POLICY ☒ PROCEDURES ☐ JOB DESCRIPTION

SUBJECT: METHOD FOR CALIBRATION OF SURVEY METERS

PROCEDURES, STANDARDS, FREQUENCY

A. Calibration of survey meters shall be performed with radionuclide sources.

1. The source shall be approximate point sources.

2. The source activities or exposure rates at given distances shall be traceable by documented measurements to a standard source certified within 5% accuracy to the U.S. National Bureau of Standards (NBS) calibrations.

3. The frequency shall be at least annually and after servicing.

4. Each scale of the instrument shall be calibrated at least at two points located at approximately 1/3 and 2/3 of full scale.

5. The exposure rate measured by the instrument shall differ from the true exposure rate by less than 10 % at the two points on each scale (read appropriate section of the instrument manual to determine how to make necessary adjustments to bring instrument into calibration). Readings within +/- 20% will be considered acceptable if a calibration chart, graph, or response factor is prepared, attached to the instrument, and used to interpret meter readings to within 10% for radiation protection purposes.

6. A Cesium 137 source will be used. (41.14 mr/hr at one meter on 1/5/84, +/- 3.0%).

B. A refernce check source of long half-life, e.g. Csl37 or Ra D and E. shall also be read at the time of the above calibration or as soon as the instrument is received from the calibration laboratory. The reading shall be taken with the check source placed in specific geometry relative to the detector. A reading of this refernce check source should be taken:

1. Before each use and after each survey to ensure that the instrument was operating during the survey.

2. After each maintenance and/or battery change.

3. At least quarterly.

   If any reading with the same geometry is not within +/- 20% of the reading measured immediately after calibration, the instrument should be recalibrated (see item A).

C. The instrument will be calibrated at lower energies if its response is energy dependent and if the instrument is to be used for quantitative measurements in the Xe-133 or Tc-99m energy ranges.

   The calibration will be done either:

   1. As a relative intercomparison with a energy independent instrument and uncalibrated radionuclides.

   2. Alternatively, the manufacturer's energy response curve(s) may be used to correct instrument readings appropriately when lower-energy radiation is monitored.

D. Records of the above items A, B-2, B-3, and C will be maintained.

E. Use of Inverse Square Law and the Radioactive Decay Law

   1. A calibrated source will have a calibration certificate giving its exposure rate at a given distanee, or its activity, measured, on a specific date by the manufacturer or NBS.

      a. The inverse square law may be used with any point source to calculate the exposure rate at other distances.

      b. The radioactive decay law may be used to calculate the exposure rates or source activities at times other than the calibration date.

   2. INVERSE SQUARE LAW

      Consider a "point" source of radiation at position S, as shown in Figure D-1. Then, the relationship between the exposure rates R1 and R2 at detector positions P1 and P2 which are at distances D1 and D2 from S respectively, is given by the following equation:

$$R_2 = \frac{D_1^2}{D_2^2} \times R_1$$

where R_1 and R_2 are exposure rates in the same units (eg. mR/hr, R/hr), and D_1 and D_2 are the distances in figure D-1 in the same units (eg. m, cm, ft.).

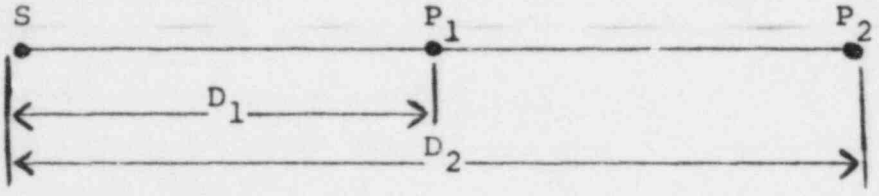

FIGURE D-1

3. RADIOACTIVE DECAY LAW

Exposure rate t units of time after specified calibration date

$$R_t = R_o \times e^{-\left[\frac{0.693}{T_{1/2}} \times t\right]}$$

WHERE:

R_o and R_t	are in the same units (eg mR/hr or R/hr).
R_o	is exposure rate on the specific calibration date.
R_t	is exposure rate t units of time later.
$T_{1/2}$ and t	are in the same units (years months, days, etc.).
$T_{1/2}$	is radionuclide half-life
t	is number of unit of time elapsed between calibration and present time.

CERTIFICATE OF INSTRUMENT CALIBRATION

For: WING MEMORIAL HOSPITAL / NUCLEAR MEDICINE
LIC. NO. 20-15280-01

Instrument:

Manufacturer _____

Type _____

Model No. _____

Serial No. _____

Calibration Data:

Scale	Exposure rate (mR/hr)	Instrument reading (mR/hr)	Exposure rate (mR/hr)	Instrument reading (mR/hr)	Exposure rate (mR/hr)	Instrument reading (mR/hr)

Comments:

Nuclide	Activity or Exposure Rate at Specified Distance	Calibration Accuracy

Calibration Source:

Calibrated by _____ Date _____

NRC FORM 218 (4-76) NRCM 0240

U.S. NUCLEAR REGULATORY COMMISSION

DATE 8/28/85

TIME 4:10 ☐ A.M. ☒ P.M.

TELEPHONE OR VERBAL CONVERSATION RECORD

☐ INCOMING CALL ☐ OUTGOING CALL ☐ VISIT

PERSON CALLING	OFFICE/ADDRESS	PHONE NUMBER	EXTENSION
Piccone	NRC - Region I		
PERSON CALLED	**OFFICE/ADDRESS**	**PHONE NUMBER**	**EXTENSION**
Dr. Kenneth McEwen Kathleen LaFleur, Chief Tech.	Wing Memorial Hosp. Wright Street Palmer, MA 01069	(413) 283-7651	

CONVERSATION

SUBJECT Amendment Request

SUMMARY Call returned by Ms. LaFleur on 8/29/85 @ 9:00 A.M.
— problems with NRC 313M A+B for
Nicholas Spencer, M.D.

① need 500 hrs. total clinical training

② need 5 generator elutions and 5 kit preps for Group III

③ We require a copy of the signed preceptor's statement

— submit copy of the survey meter calibration procedure so it can be on record with your license.

"OFFICIAL RECORD COPY" ML18

REFERRED TO:

☐ ADVISE ME OF ACTION TAKEN.

ACTION REQUESTED

A letter detailing the above will be sent.

INITIALS J.M.P.

DATE 8/29/85

ACTION TAKEN

INITIALS

DATE

NRC FORM 218 (4-76)

WING MEMORIAL HOSPITAL

COMMUNITY HEALTH CENTER

Wright Street
Palmer, Ma. 01069
413/283-7651

July 30, 1985
License No. 20-15280-01
Docket No. 030-08859

United States
Nuclear Regulatory Commission
Region 1
King of Prussia, Penn. 19406

Dear Dr. Glenn:

In response to the routine safety inspection conducted by Jenny Johansen and to your letter dated July 17, 1985, the following actions have been taken.

Responses to Appendix A ; Notice of Violations:

A) Please find enclosed the NRC-313M- Supplements A and B for Nicholas Spencer M.D., We would like him to be added to our license for Groups I, II, and III.

Prior written approval by the hospital administrator and the Medical Isotopes Committee will be maintained for inspection for all visiting physicians.

B) 1) We will strictly enforce our commitment to use syringe shields in the preparation and injection of patient doses.

2) We would like to amend our license to allow us to possess 165 millicuries of Cesium 137 as a sealed source for use in the calibration of our survey meters. The source is owned by Mercy Hospital in Springfield, Mass. (license No. 20-00096-02). The source will be transported to our facility by private carrier (Ronald P. Hanc, who is listed on the Mercy license as the authorized user). Mr. Hanc will perform the survey meter calibrations as detailed in the Mercy Hospital license. Current D.O.T. regulations will be followed when the source is transported. Upon arrival of the source at our

WITH SATELLITE HEALTH CENTERS AT

10 South Main Street
Belchertown, Ma. 01007
413/323-5118

187 Main Street
Monson, Ma. 01057
413/267-5181

3 Crane Park Drive
Wilbraham, Ma. 01095
413/596-3455

WING MEMORIAL HOSPITAL

COMMUNITY HEALTH CENTER

Wright Street
Palmer, Ma. 01069
413/283-7651

facility a Radioactive Shipment Receipt Report (appendix F of Guide 10.8) will be completed. The source will be returned to Mercy Hospital later the same day by Mr. Hanc, after the calibrations of our survey meters have been completed.

3) We would like to amend our license to require accuracy testing of our dose calibrator on an annual basis rather than quarterly. Please find enclosed a copy of the test performed on 7/26/85. The dose claibrator linearity test will continue to be performed quarterly. We would, however, like to perform the linearity test using the CALICHECK Dose Calibrator Activity Linearity Test Kit. Manufactors instructions and procedures will be carefully followed. Find enclosed the manufactors literature on this test kit.

4) As per our discussion with Jenny Johansen we initiated (7/1/85) a study to evaluate the exposure to both hands of our ambidextrous technologist to determine which hand most adequately reflects the extremity exposure received by this individual. The study will be evaluated after three months of finger badge readings.

Respectfully submitted,

Richard H. Scheffer

Mr. Richard Scheffer
President
Wing Memorial Hospital
Wright Street
Palmer, Mass. 01069

Sept - 1 - I

Applicant.....
Check No. 006748.....
Amount (C) 4.25 refund 5
Type of ... Amc
Date Check Rec'd. 9/3/85...
Received By.....

WITH SATELLITE HEALTH CENTERS AT

10 South Main Street
Belchertown, Ma. 01007
413/323-5118

121 Main Street
Monson, Ma. 01057
413/267-5181

3 Crane Park Drive
Wilbraham, Ma. 01095
413/596-3455

FORM NRC-313M-SUPPLEMENT A (8-78) — U.S. NUCLEAR REGULATORY COMMISSION

TRAINING AND EXPERIENCE
AUTHORIZED USER ~~OR RADIATION SAFETY OFFICER~~
(Completed for RSC Record 6/19/85)

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE
NICHOLAS SPENCER, M.D.	Massachusetts

3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C
American Board of Radiology	Diagnostic	June, 1981

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION	Boston City Hospital - 1980	150	20
b. RADIATION PROTECTION	Boston City Hospital - 1980	30	--
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	Boston City Hospital - 1980	50	15
d. RADIATION BIOLOGY	Boston City Hospital - 1980	25	--
e. RADIOPHARMACEUTICAL CHEMISTRY	Boston City Hospital - 1980	15	10

5. EXPERIENCE WITH RADIATION. *(Actual use of Radioisotopes or Equivalent Experience)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
As listed above	100 mCi	Boston City Hospital	9 months	clinical

FORM NRC-313M-SUPPLEMENT B
(8-78)

U. S. NUCLEAR REGULATORY COMMISSION

PRECEPTOR STATEMENT

Supplement B must be completed by the applicant physician's preceptor. If more than one preceptor is necessary to document experience, obtain a separate statement from each.

1. APPLICANT PHYSICIAN'S NAME AND ADDRESS

FULL NAME

NICHOLAS SPENCER, M.D.

STREET ADDRESS

130 Maple Street

CITY	STATE	ZIP CODE
Springfield	MA	01105

KEY TO COLUMN C

PERSONAL PARTICIPATION SHOULD CONSIST OF:

1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage.

2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data.

3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.

2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS *(Additional information or comments may be submitted in duplicate on separate sheets.)* D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION	65	
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME	--	
	LIVER FUNCTION STUDIES	--	
	FAT ABSORPTION STUDIES	--	
	KIDNEY FUNCTION STUDIES	--	
	IN VITRO STUDIES	--	
OTHER		--	
I-125	DETECTION OF THROMBOSIS	--	
I-131	THYROID IMAGING	65	
P-32	EYE TUMOR LOCALIZATION	--	
Se-75	PANCREAS IMAGING	--	
Yb-169	CISTERNOGRAPHY	10	
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES	70	
OTHER		--	
Tc-99m	BRAIN IMAGING	30	
	CARDIAC IMAGING	60	
	THYROID IMAGING	--	
	SALIVARY GLAND IMAGING	--	
	BLOOD POOL IMAGING	--	
	PLACENTA LOCALIZATION	--	
	LIVER AND SPLEEN IMAGING	100	
	LUNG IMAGING	70	
	BONE IMAGING	100	
OTHER		--	

PRECEPTOR STATEMENT *(Continued)*

2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN *(Continued)*

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS *(Additional information or comments may be submitted in duplicate on separate sheets.)* D
P-32 *(Soluble)*	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA, AND BONE METASTASES	--	
P-32 *(Colloidal)*	INTRACAVITARY TREATMENT	--	
I-131	TREATMENT OF THYROID CARCINOMA	15	
	TREATMENT OF HYPERTHYROIDISM	15	
Au-198	INTRACAVITARY TREATMENT	--	
Co-60 or Cs-137	INTERSTITIAL TREATMENT	--	
	INTRACAVITARY TREATMENT	--	
I-125 or Ir-192	INTERSTITIAL TREATMENT	--	
Co-60 or Cs-137	TELETHERAPY TREATMENT	--	
Sr-90	TREATMENT OF EYE DISEASE	--	
	RADIOPHARMACEUTICAL PREPARATION	--	
Mo-99/ Tc-99m	GENERATOR	--	
Sn-113/ In-113m	GENERATOR	--	
Tc-99m	REAGENT KITS	--	
Other		--	

3. DATES AND TOTAL NUMBER OF HOURS RECEIVED IN CLINICAL RADIOISOTOPE TRAINING

400 hours

1980 - 1981

4. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OF:

a. NAME OF SUPERVISOR

Victor Lee, M.D

b. NAME OF INSTITUTION

Boston City Hospital

c. MAILING ADDRESS

Harrison Avenue

d. CITY

Boston, MA

5. MATERIALS LICENSE NUMBER(S)

6. PRECEPTOR'S SIGNATURE

Signature on orginal forms in Medical Staff Office

7. PRECEPTOR'S NAME *(Please type or print)*

Victor Lee, M.D.

8. DATE

Completed for our records 6/19/85 by Dr. Brahmavar in consultation with Dr. Spencer.

FORM NRC 313M-SUPPLEMENT B
(8-78)

Nuclear Medicine Department

ANNUAL ACCURACY TEST OF THE DOSE CALIBRATOR

HOSPITAL Wing Memorial Hosp.
INSTRUMENT LOCATION Nuclear Med.
MODEL NUMBER CRC 6A
TECHNOLOGIST Kathy Laflure RTR

DATE July 26, 1985
MANUFACTOR Capintec
SERIAL NUMBER 626030
PHYSICIST Ronald P. Hare, M.S.

STANDARDS USED:

CALCULATED ACTIVITY DAY OF CALIBRATIONS:

	Source	Serial #	Original Act/Date	Activity today	Dose Cal. Reading	% Variation
#1	Co^{57}	2260484B-47	4.8mCi 4/26/84	1.493mCi	1.460mCi	-2.2%
#2	Cs^{137}	3561081A-37	207uCi 10/6/81	189.9uCi	190.5uCi	+.3%
#3	Co^{60}	3540581A-51	53uCi 5-8-81	34.72uCi	33.8uCi	-2.4%

Percent variation = Dose cal reading div by actual act.

THE ACTIVITY SHOULD BE WITHIN + OR - 5.0% OF THE CALCULATED ACTIVITY TO ASSURE ACCURACY OF THE DOSE CALIBRATOR. IF THE READINGS ARE NOT WITHIN THE 5% RANGE, REPAIR OR ADJUSTMENT IS NECESSARY.

THIS SURVEY IS TO BE PERFORMED ANNUALLY AS A REQUIREMNT OF THE NRC. REGUAATORY GUIDE 10.8. APPENDIX D, SECTION 2, ITEM G.

7/15/85 kal

DOSE CALIBRATOR

Activity Linearity Testing the easy way

Fast

Now with the newly developed Calicheck™ dose calibrator activity linearity test kit, you can meet N.R.C. Regulatory Guide 10.8, appendix D., Section 2E or your state's equivalent requirement in just 4 minutes — not days. You can complete the test in one short sitting and check for linearity virtually at a glance. Plus you eliminate the frustration of having to start the test all over simply because you forgot to take a reading on time.

Accurate and Reliable

The new Calicheck kit is designed to attenuate ^{99m}Tc by known values — accurate using a high yield generator eluant or a unit dose.

A Calicheck kit provides for seven successive measurements simulating the decay of ^{99m}Tc at approximately 0, 6, 12, 20, 30, 40 and 50 hours from the initial assay.

Complete Yet Reusable

Your Calicheck kit comes to you complete with its own storage container, a unique arrangement of seven color-coded lead-wrapped tubes, work/record keeping sheets, instructions for use and a license amendment form (if needed.)

Your Calicheck kit is completely reusable for an indefinite period of time. There is nothing to wear out or use up. If damage should cause a tube to malfunction, individual replacements are available.

Safe

Your use of a Calicheck kit eliminates the need to fractionate eluants or decay the elution for several days while periodically collecting data to determine linearity. Time of potential exposure to radiation is drastically reduced, thereby maintaining exposures ALARA.

Lowers Department Cost

When you test with a Calicheck kit, both the source activity and dose calibrator can be returned to active service in just minutes. This savings alone can pay for a Calicheck kit in just three to four linearity tests. A Calicheck kit lets you return to active service too!

Can Improve Patient Care

A Calicheck kit is so fast, efficient and easy to use, you may wish to check dose calibrator linearity more frequently. Lets you spot trouble before it becomes serious.

Low Price

A Calicheck dose calibrator activity linearity test kit is just $375.00 shipping included.

Just call (216) 663-1773 or write: Calcorp, Inc., P.O. Box 25589, Cleveland, Ohio 44125–0589.

Just four minutes

As simple as 1, 2, 3, 4, 5, 6, 7. Place central tube in the dose calibrator. Place the source in this tube and take a reading. Then sequentially place color-coded tubes over the central tube. Additional readings are taken immediately, converted with a predetermined factor and you can see the degree of linearity virtually at a glance.

May require approval of the Agency issuing your radioactive materials license.

Calicheck™

• DOSE CALIBRATOR ACTIVITY LINEARITY TEST KIT •

Patent pending

See us at the SNM Show in Miami Beach at Booth 404

Reprinted from the JOURNAL OF NUCLEAR MEDICINE
May, 1982, Volume 23, Number 5