

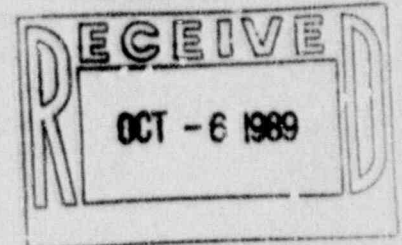
Southwestern Medical Center

5602 S.W. Lee Blvd.
Lawton, Oklahoma 73505

405 531-4700

TO: Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

FROM: Southwestern Medical Center
Department of Radiology
Lawton, Oklahoma 73505



September 20, 1989

SUBJECT: Response to Violation Notice

Gentlemen:

This refers to the recent letter of notice concerning violations as result of the inspection of our facility. Those explanations concerning the violations are as follows. Each explanation required for the provisions, follows 10 CFR 2.201 guidelines described in your memorandum.

VIOLATION (A): 10 CFR 35.632(b)(1) Calibration measurements of teletherapy units must include determination of output is within plus or minus 3 percent for the range of field sizes and for the distance or range of distances used for medical use.

EXPLANATION: (1) Over the last three years the calibration of the teletherapy unit has always been within plus or minus 1 percent. The consulting physicist does not make it routine procedure to document that peculiar statement. In order to be in compliance with this requirement, he will begin immediately to document as required. Compliance began effective September 18, 1989.

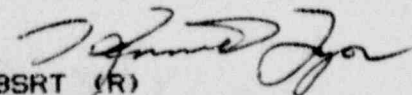
VIOLATION (B): Condition 21 "Calibration of survey instruments" states that survey instruments will be calibrated at least annually and following repair.

EXPLANATION: (2) The survey instruments are calibrated by the consulting physicist and/or manufacturer on an annual basis. After the annual inspection of the survey meters in 1988 the date of calibration label was not applied. In order to correct those actions the following steps have been taken.

- (1) The Victoreen Model #450, Serial#440 was sent to the manufacturer for calibration on Sept 5, 1989.
- (2) Ludlum Measurements, Inc Model#300, Serial#26116 was calibrated on September 5, 1989 by the consulting physicist.
- (3) The Victoreen Model #495-5, Serial#756 was calibrated on September 12, 1989 by the consulting physicist.

The annual survey survey meter calibration for each respective meter is attached for your inspection. A calendar of requirements has been established in order to determine the time periods for evaluating the survey meters and other components that are required by the Nuclear Regulatory Commission.

Respectfully,


Kenneth Lyon, BSRT (R)
Director of Radiology

A MEMBER OF
EPHC HEALTHCARE GROUP

JEON

8910180126
REG4 LIC30
35-10669-02
20 PDC

IC-89-648

ANNUAL SURVEY METER CALIBRATION.

RADIATION SAFETY OFFICE

Radiological Physics Services

Instrument Type GM Monitor
 Manufacturer Victoreen M495-5
 Identification S 756
 Laboratory Rad Therapy, SMP
 Response Setting NA
 Shield } Position ON
 Cap }

Date 9/12/89
 Signature DW Anderson
 Source Ident. Cs-137, M6E01, S07073
 Source Strength (SS) 27.0 mCi
 Press NA Temp NA
 Decay Factor (DF) 0.97
 Exposure Rate = SS (DF) 3226
 = 84490 mR/h@1cm

Scale (mR/hr)	CPM	X1	0.2	X1	2.0	X10	3.0	2.0	3.0	X10	20
Distance (cm)	1170	750	500	450	350	275	235	200	150	110	
mR/hr	0.062		0.34		0.61				3.8		
Background	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	
Reading	40		200		400				2400		
Cal. Factor	0.0016		0.0017		0.0017				0.0016		

mR/hr per CPM

Remarks:

400 on any scale turns the flasher on (0.8 of full scale)
 speaker works well

red light okay, rest okay when CPM down

Cal Factor 0.00165 ± 0.00006 mR/hr per CPM
 $\pm 4\%$

ANNUAL SURVEY METER CALIBRATION
RADIATION SAFETY OFFICE

Instrument Type GM Monitor Date 9/12/89
 Manufacturer Victoreen M495-S Signature DW Lindeman
 Identification 5756 Source Ident. Cs-137, M6505, 500548
 Laboratory Radiation Therapy SMMC Source Strength (SS) 78.9mCi
 Response Setting NA Press NA Temp NA
 Shield } Position 09 Decay Factor (DF) 0.97
 Cap } Exposure Rate = SS (DF) 3226
 = 246900 mR/h@1cm

Scale (mR/hr)	$\times 100$ 10	25-30	7.0	25-30	$\times 100$ 100	25.0	$\times 100$ 100	$\times 100$ 250	200	1000
Distance (cm)	190	190	135	110	110	60	60	50	45	30
mR/hr	6.8				20.4		68.6			
Background	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.04
Reading	5500				12000		57000			
Cal. Factor	0.00184				0.0017		0.0018			

mR/hr per CPM

Remarks:
 mR/hr per CPM 0.0017 ± 0.0001 Cal Factor
 $+ 690$
 $- 690$

ANNUAL SURVEY METER CALIBRATION

RADIATION SAFETY OFFICE

Radiological Physics Services

Instrument Type GM Monitor
 Manufacturer Ludlum M300/4
 Identification PRO16088
 Laboratory Rad Therapy SWM
 Response Setting 4, S
 Shield } Position NA
 Cap }

Date 9/5/89
 Signature DW Anderson
 Source Ident. Cs-137, M6501, 507073
 Source Strength (SS) 27.0 mCi
 Press NA Temp NA
 Decay Factor (DF) 0.97
 Exposure Rate = SS (DF) 3226
 = 84,490 mR/h@1cm

Scale (mR/hr)	0.2	0.2	1.0	2.0	1.0	3.0	2.0	3.0	10	20
Distance (cm)	1170	750	500	450	350	275	235	200	150	110
mR/hr			0.34		0.69				3.8	
Background	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Reading			0.4		0.8				4.5	
Cal. Factor			0.85		0.86				0.84	

Remarks:

all readings are within $\pm 20\%$ of the actual values.

ANNUAL SURVEY METER CALIBRATION

RADIATION SAFETY OFFICE

Radiological Physics Services

Instrument Type GM Monitor
 Manufacturer Ludlum M300/4
 Identification # P:016088
 Laboratory Rad. Therapy SWMC
 Response Setting 64, S
 Shield } Position: NA
 Cap }

Date 9/5/89
 Signature RAW Anderson
 Source Ident. Cs-137, M6505, 500518
 Source Strength (SS) 78.9mCi
 Press NA Temp NA
 Decay Factor (DF) 0.97
 Exposure Rate = SS (DF) 3226
 = 246,900 mR/h@1cm

Scale (mR/hr)	10	25-30	20	25-30	.00	200	100	²⁵⁰ -300	200	1000
Distance (cm)	190	190	135	110	110	60	60	50	45	30
mR/hr	6.8				20.4		68.6			
Background	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.04
Reading	8				22		70			
Cal. Factor	0.85				0.93		0.98			

↑
no light

↑
red light
ok.

Remarks:

All readings within $\pm 20\%$ of the actual values.

Instructions: Complete and retain Department Copy and send remaining copies to Materials Management.

AMI Departmental Requisition

No. 220010

Prepital Name and Number

Date 9-5-89

Department Radiology → Account Number 7153

Ordered by Received by

Quantity Ordered, Unit, Back Ordered, Quantity Shipped, Manufacturer, Catalog number, Description, For Purchasing Use Only (Unit Price, Total)

Table with 9 columns: Quantity Ordered, Unit, Back Ordered, Quantity Shipped, Manufacturer, Catalog number, Description, For Purchasing Use Only (Unit Price, Total). Row 1: 1, [blank], [blank], [blank], [blank], [blank], Calibrate Victoreen Survey meter model #450 Serial #440, [blank], [blank].

Department Head

Order Filled by [Signature]

RADIOLOGICAL PHYSICS SERVICES
David W. Anderson, Ph.D., FACR

Physics of:
Radiation Therapy
Diagnostic X-Ray
Nuclear Medicine
Radiation Safety
Magnetic Resonance Imaging

September 26, 1989

TO: Whom it may concern
FROM: David W. Anderson, Ph.D. *DWA*
Consulting Physicist
SUBJECT: Full Calibration Measurements of Picker ⁶⁰Co Unit at South-
western Medical Center, Lawton, OK

I always have measured the absolute value of the ⁶⁰Co exposure rate or dose rate at standard field size and distance to 1% or less during each full calibration. I always have compared the measured value to the calculated value from initial measurements using the exponential decay law. If the measured and the calculated values do not agree to within +2% I have always investigated further to determine the cause of the disagreement. As appropriate I'll correct the table of dose rates to be used by the licensee in months to follow after the full calibration to the most accurate value within +1%. Furthermore field size and distance factors etc. are always measured to within +1%. Thus my practises always have been more stringent than the USNRC requirement (-3%).

I can find no specific requirement to explicitly mention accuracy limits in my copy of 10 CFR 35. Nonetheless it is very easy to state that all dose rates and factors as indicated are well within +3% required by USNR. I will do so conspicuously on succeeding reports.

DWA:lt

7419 S. Maplewood
Tulsa, OK 74136
(918) 493-8016 daytime
(918) 492-6136 evenings