

Philips Medical Systems

April 10, 1985
0220-85

MS 18
P6

Nuclear Regulatory Commission
Region 1
631 Park Ave.
King of Prussia, PA 19406

Attention: Laurence F. Friedman, Ph.D., C.H.P.
Senior Radiation Specialist

REFERENCE: LICENSE NUMBER 06-10081-03
DOCKET NUMBER 030-17244
CONTROL NUMBER 18340

Gentlemen:

This is in response to your letter of February 22, 1985, regarding our renewal of above referenced license. I apologize for the delay. I had to await information from a few sources and since the people were traveling, it took more time than we had anticipated. The following responses are according to your numbered paragraphs:

1. Mr. Worrilow states that during his association with the University of Pennsylvania, Department of Radiology, from January 1967 to December 1968, he worked very closely with John Hale, Ph.D., Associate Professor of Radiation Physics and Peter Bloch, M.S. in the performance of radiation measurement, procedures and instrumentation. He participated in the investigation and publication in the use of silicon p-i-n radiation detector as an analog of an air ionization chamber and co-authored with Dr. Hale an intramural report on the evaluation of radiographic equipment.

His formal training in radiation protection is non-existent, however, he did extensive studies in Handbook 76, U.S. Department of Commerce, National Bureau of Standards and further the NCRP Report No. 34, Medical X-Ray and Gamma-Ray Protection for Energies up to 10 MeV.

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06-10081-03 PDR

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ML10

PHILIPS MEDICAL SYSTEMS, INC.
710 BRIDGEPORT AVENUE
SHELTON, CONNECTICUT 06484
(203) 926-7674

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APR 16 1985

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2. Instructions for proper film badge position are discussed in detail during radiation training sessions. Special emphasis is placed on the necessity to protect the crystalline structure of the eye from direct exposure to radiation. The use of angle mirrors or leaded glass viewing windows is specifically recommended, and the suggestion that when they are working in this type of environment, they should wear the badge on their collar as opposed to under the lead rubber apron.
3. Regarding radiation safety training, each radiation group is administered by a qualified Area Radiation Safety Officer, and it is his responsibility to discuss the aspects of radiation safety at the time a radiation badge is issued. Philips Medical Systems, Inc. gives periodic lectures on the subject of radiation safety to those individuals that are covered by our badge service. These additional lectures are presented by the Company Radiation Safety Officer to groups of ten to twenty individuals.

In addition, only those persons specifically authorized to use sources, covered by the above referenced license, actually use them. Others, even though they have radiation monitoring, do not. The great majority of our personnel are in our radiation monitoring program for the x-ray diagnostic equipment, which we manufacture, sell, install and service. In this area, the badges are issued because we want our workers to be reminded to be cautious and for personal reasons. None of them work in areas or with equipment where they are expected to receive greater than 100mr/week. In fact, the normal film badge reading is 0. Occasionally, we get a badge reading, but it is usually due to heat, not radiation.

4. (a) Dose rates are not calculated per se. The value of radiation rate output is determined according to the enclosed curve as provided by vendor of the radiation source. (see attached copy)

The distance is measured, when calibrating an instrument, using a tape measure extended between the source output to the center of the active volume of the probe being calibrated.

The radiation intensity (source strength) is measured prior to performing calibration using a probe/electrometer which was independently calibrated to standards traceable to NBS. (see attached)

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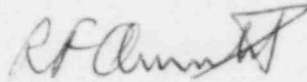
(b) We confirm that each instrument is calibrated at two points separated by at least 50% of full scale. Since CS 137 emits negative beta particles at 0.55 MeV and 0.57 MeV no distinction is made with regard to the shift in scale because of energy dependence.

The measuring points are established by changing the distances to the source according to the emission rate/distance curve.
(see attached)

(c) A copy of the Certificate of Conformance is attached.

(d) and (e) Diagrams are submitted as requested. No radiation above background detected at the points indicated.

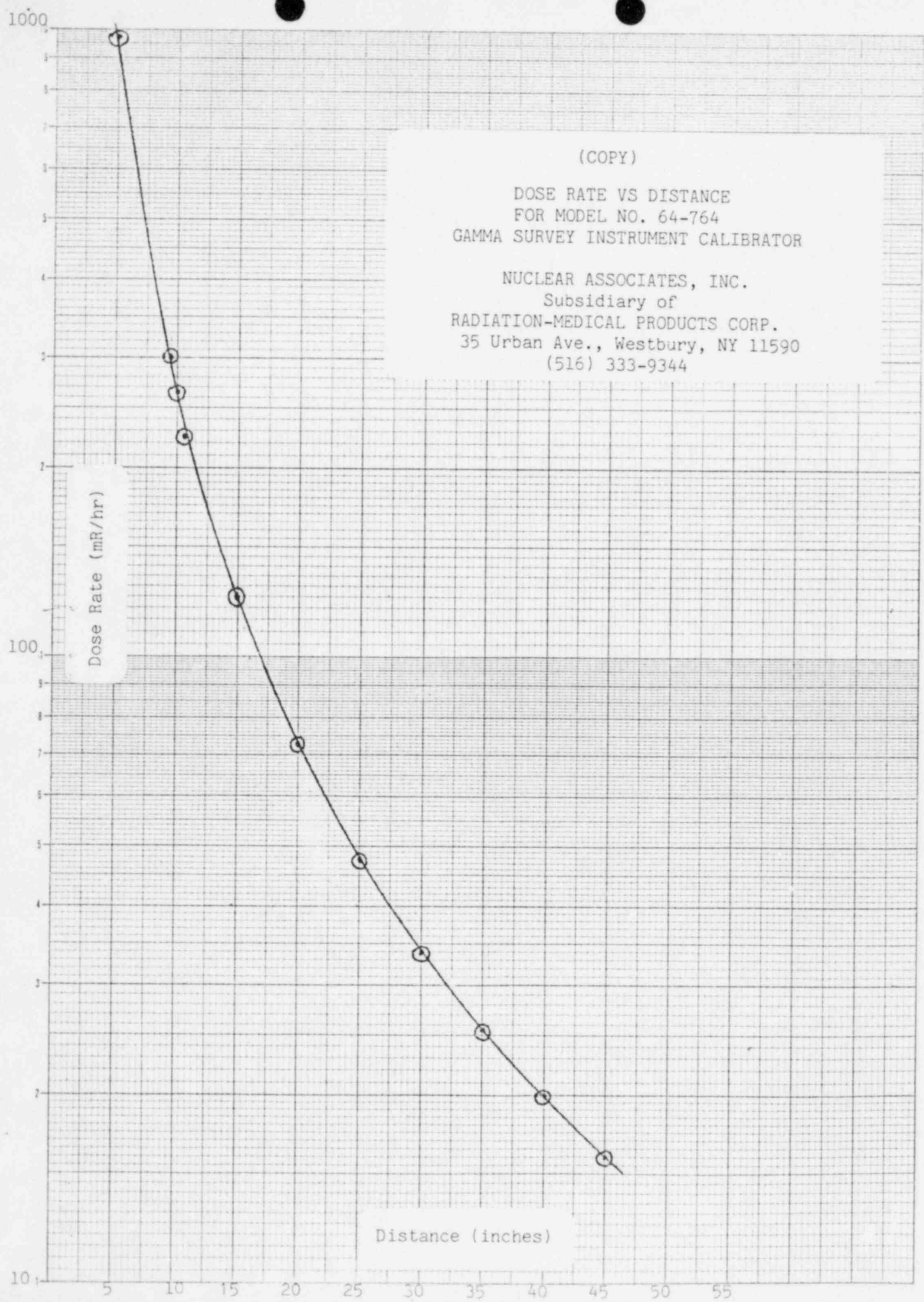
Sincerely,



Robert F. Avrutik
Director
Regulatory Department

RFA/jmg
Attachment

SEMI LOGARITHMIC 2 CYCLES X 100 DIVISIONS AD 0030-6T



(COPY)

DOSE RATE VS DISTANCE
FOR MODEL NO. 64-764
GAMMA SURVEY INSTRUMENT CALIBRATOR

NUCLEAR ASSOCIATES, INC.
Subsidiary of
RADIATION-MEDICAL PRODUCTS CORP.
35 Urban Ave., Westbury, NY 11590
(516) 333-9344

TM *Radcal Corporation*

426 west duarte road monrovia, california 91016
tlx 182910 mdh ind mrov outside california

(818) 357-7921
(800) 423-7169

CERTIFICATE OF CONFORMANCE

ISSUED TO

Philips Medical Systems, Inc.
710 Bridgeport Avenue
Shelton, Connecticut 06484

Identification

Model 1015C Radiation Monitor, S/N 1352
Model 10X5-6 Ion Chamber, S/N 3368
Model 10X5-180 Ion Chamber, S/N 5324

The equipment identified above has been subjected to standard RADCAL acceptance test procedures. It has been found to conform in all respects. All radiation measurements performed during the acceptance testing employ NBS traceable techniques. These test procedures are designed to ensure that the tested equipment meets or exceeds the manufacturer's specifications.

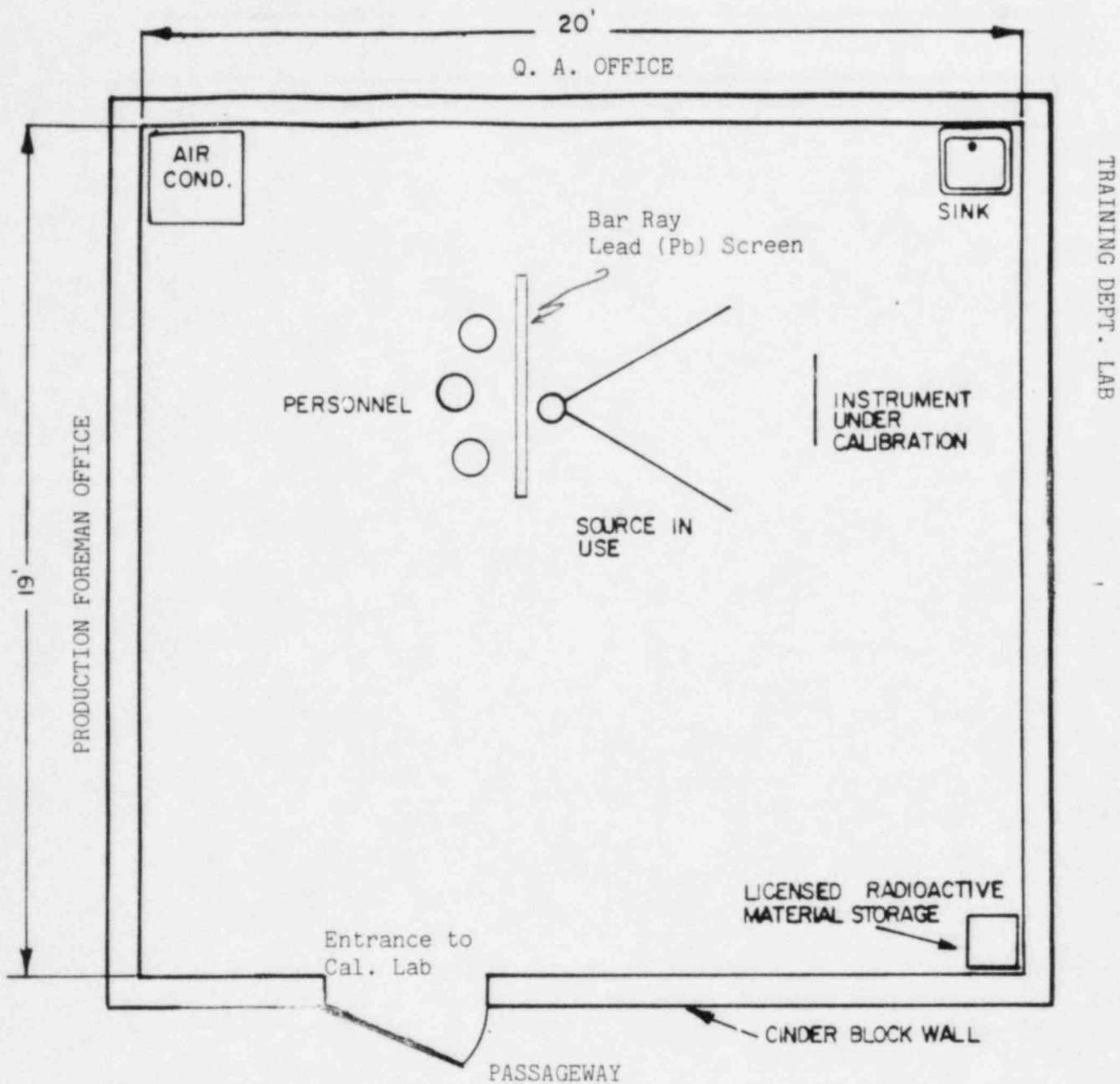
TESTED BY

M. Wakfield

DATE OF TEST

2/26/85

This is a true + certified copy.
Robert L. Fair
National Public
Health Commission 3/31/87



CONDITIONS

Source Open

Source Closed
& In Storage

Measurement at 3'
Intervals Along Wall
@ 3' height @ 6' height

No Indication No Indication

No Indication No Indication

MEASUREMENT SYSTEM

1. MDH 1015C S/N1352
2. Victoreen 440 Survey

CONVERSATION RECORD

TIME
1600DATE
4/19/85

TYPE

☐ VISIT☐ CONFERENCE☒ TELEPHONE☐ INCOMING☐ OUTGOING

ROUTING

NAME/SYMBOL

INT

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT
WITH YOUORGANIZATION (Office, dept., bureau,
etc.)

TELEPHONE NO.

(203) 926-
7031

Angelo Veca, Director, QA

Phillips Medical Systems

SUBJECT

Questions re: their letter of 4/10/85

SUMMARY

Supplied curve used because curve does not follow inverse square. Radiation levels checked with MDH Model 1015 calibrated by manufacturer. Check \bar{c} 1015 used in lieu of decay correction. Curve extrapolated to low doses. No attempt ~~Records~~ made to determine why inverse square law not ~~so~~ followed, nor to calculate decay of source, nor to calculate dose rate from ~~the~~ gamma factor.

Records of calibrations appear to be O.K.

Survey of radiation levels in unrestricted areas O.K.

Veca gave me the impression that general radiation protection (X-ray) was good, i.e., interlocked cabinets for X-ray units, cabinets surveyed periodically for leakage, surveys around setups such as phantoms in X-ray beams + use of shielding.

ACTION REQUIRED

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NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

ACTION TAKEN

SIGNATURE

TITLE

DATE