Beaumont

William Beaumont Hospital
Royal Oak

Medical Physics and
Engineering

June 14, 1985

United States Nuclear Regulatory Commission
Material Licensing Branch
799 Roosevelt Road
Glen Ellyn, Illinois 60137

030-00256

Re.: License No. 21-01333-2

T Ed 2/28/89

Gentlemen:

We have sold our Siemens Gammatron S Cobalt-60 machine to the Varian Corporation. On June 9, 10, and 11, 1985, the X-ray Equipment Company, 2601-05 Tudelle Street, P.O. Box 2431, Fort Worth, Texas 76113-2431, removed the unit.

We received a copy of the X-ray Equipment Company's license and their transfer form. Both are enclosed. We supplied them with a copy of our license, a wipe test done on June 6, 1985, and the source certificates. The last two items are also enclosed.

With the removal of the Co-60 machine, there is no further need to maintain License No. 21-01333-2.

Please let me know if there is any further information required to terminate this license. Kindly provide us with written confirmation that this license has been cancelled.

RECEIVED BY LFMB
Date 7/1/85
Log
By
Orig. To
Action Compl

Sincerely yours,

Ann L. Forsaith

Ann L. Forsaith, M.P.H.
Manager, Medical Physics Section

RECEIVED
JUN 24 1985
REGION III

ALF:rmk
cc: Dr. Darlene Fink-Bennett, Chairperson,
WBH Radiation Safety Committee

Enclosures

FEE EXEMPT

JUN 24 1985

3605 West Thirteen Mile Road Royal Oak, Michigan 48072 (313) 288-8373

This is to certify that a Cobalt-60 Source:

Model Number: AECL C-151
Serial Number: S 3341
Containing 7961 Curies as of June 1982

and which has been determined by wipe test to be leak free, has been installed in a Teletherapy Unit described as follows:

Manufacturer: Siemens
Model Number: Gammatron S
Serial Number:

and is hereby transferred from:

William Beaumont Hospital

3601 West 13 mile Rd, Royal Oak Michigan

License Number: 21-1333-2 (D68)

TO: X-RAY EQUIPMENT COMPANY
Fort Worth, Texas 76104
Texas Radioactive Material License Number: TX-5-1485

[illegible]
William Beaumont Hosp

DATE: June 11, 1985

Denny M. Peabody
X-Ray Equip Co

DATE: Jun 11, 1985

Co-60 Wipe Test

The Siemens Gammatron S Cobalt-60 machine was wipe tested on June 6, 1985. All accessible surfaces were wpied. Five cotton tipped swabs were used. The swabs were counted together in a Picker well counter connected to a Spectroscaler.

A Co-60 source of 0.93 uCi on 8/3/66, current activity 0.078 uCi, was counted to determine the counts necessary to detect 0.005 uCi of Co-60.

The following data was obtained with a window setting of 800 keV to 2,000 keV:

Background	10 min.	465 counts	46.5 cpm
Swipes	10 min.	426 counts	42.6 cpm
Co-60 Source	10 min.	261,129 counts	26,113 cpm

From the Co-60 source (26,113/0.0775) x 0.005 = 1,684 cpm for 0.005 uCi.

The well system is capable of detecting 0.005 uCi of Co-60. From the counts obtained on the swipes, the contamination is then less than 0.001 uCi of contamination. The source is therefore considered not to be leaking.

Test performed by:

Ann L. Forsaith, M.P.H.
Certified American Board of Radiology

Joe Wong, M.S.

ALF:rmk

LEAK TEST CERTIFICATE
ATTESTATION D'ÉTANCHÉITÉ

ORDER No. / ***Nº DE COMMANDE*** P&S 42571

DATE 1982 August 12

DESCRIPTION OF SOURCE TESTED
DESCRIPTION DES SOURCES VÉRIFIÉES

One Cobalt-60 Teletherapy Source 2.0 CM. Active Diameter, AECL Type C 151
Une source de téléthérapie au Cobalt-60, *CM de diamètre actif, ÉACL Type C*

Serial No. / *Nº de série* S-3391 Other / *Autre*

LEAK TESTS PERFORMED
ÉPREUVES D'ÉTANCHÉITÉ EFFECTUÉES

(See reverse for description of tests)
(Description des épreuves au verso)

RESULTS OF TESTS
RÉSULTATS DES ÉPREUVES

☒ 1. THE DRY WIPE TEST, PROCEDURE DG-0065
ÉPREUVE PAR FROTTEMENT À SEC, PROCÉDÉ DG-0065 — NEGATIVE

☐ 2. OTHER TESTS (AS DESCRIBED BELOW)
AUTRES ÉPREUVES (DÉCRITES CI-APRÈS)

DATE OF COMPLETION OF TESTS
ÉPREUVES TERMINÉES LE

1982 August 12

FOR THE COMPANY
POUR LA SOCIÉTÉ

Source Production Department
Service de la production des sources

Atomic Energy of Canada Limited
Commercial Products
P.O. Box 6300
Postal Station J
Ottawa, Canada
K2A 3W3

L'Énergie Atomique du Canada, Limitée
Produits Commerciaux
C.P. 6300
Succursale Postale J
Ottawa, Canada
K2A 3W3

ISO-091

Pink/Rose — Central Records/Richier Central
Yellow/Jaune — Unit History File/Dossier de l'historique des appareils
Blue/Bleu — Industrial Products/Produits industriels
Green/Vert — Quality Assurance/Assurance de la qualité

Certificate Of Measurement

of

TELETHERAPY SOURCE S3391

for

CUSTOMER William Beaumont Hospital
Royal Oak, Michigan

AECL ORDER No. P&S 42571

THERAPY UNIT OUTPUT When installed in a teletherapy unit, the source exposure rate will increase by an amount dependent on the field size setting and equipment conversion ratio of the unit.

MEASUREMENT OF SOURCE Source S3391 is a 2.0 cm diameter standard source, type C-151 Co60C, containing 7961 curies cobalt 60. The source exposure rate was 141.7 Rmm (±3%) at the one metre position of the measurement cell.

DATE OF MEASUREMENT June 15, 1982

MEASUREMENT METHOD

The source exposure rate was measured in the cell described on the following sheet (Form QC 9 Sheet 2). The exposure rate was measured with an air wall cavity ionization chamber having a volume of 0.6 cm^3 and fitted with a 4.6 mm lucite equilibrium cap. The instrument is calibrated in a cobalt-60 exposure rate certified by the National Research Council of Canada.

ACCURACY

The uncertainty in the source exposure rate applies only to measurement of this source in the AECL Measurement Cell. It represents the maximum total uncertainty due to all causes including the calibration of the Council's primary exposure rate, the calibration of their instrumentation and the precision of measurement in the Measurement Cell. Additional uncertainty due to the comparative measurements involved, has been included in the statement of unit output.

EXCERPT FROM THE RECOMMENDATIONS OF THE INTERNATIONAL COMMISSION ON RADIATION UNITS & MEASUREMENTS, REPORT ICRU-18, OCTOBER 1970. "It must be emphasized the measurement of exposure rate and/or absorbed dose for treatment purposes should be made locally by the user himself. The statement of equipment conversion ratio by the manufacturer should not be regarded as a substitute for this."

ISSUED 1982 August 5

APPROVED P.D. Lanoue
Measurement

S.D. Booth Quality Control

Atomic Energy of Canada Limited • Commercial Products
Ottawa · Canada

NOTE: Rmm stands for roentgens per minute at one metre.

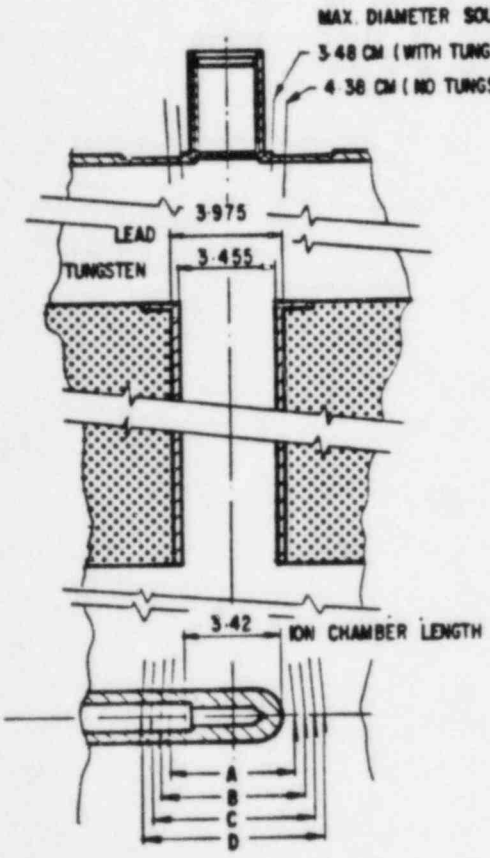
FORM QC 9 · SHEET 1 5/73

CONTROL NO. 79220

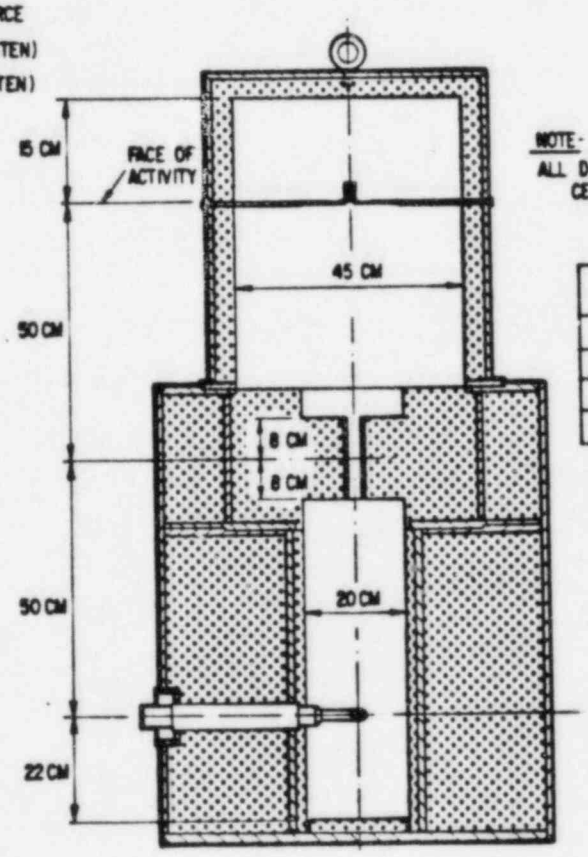
MEASUREMENT CELL FOR TELETHERAPY SOURCES

The exposure rates from these sources are measured in a cell designed and constructed for this purpose by Atomic Energy of Canada Limited and located in Ottawa. It meets all the specifications laid down in report ICRU-18 (by the International Commission on Radiation Units and Measurements) issued in October, 1970. These specifications define a measurement cell contributing less than 1% additional scattered radiation to the actual radiation emitted by the source. The cell is intended for use remotely inside a hot cell. The sketches below depict the important features of the cell.

The source is placed on a light aluminum support in the upper compartment. The collimator is lead, 16 cm thick, situated midway between source and probe. The collimator may be reduced in diameter when measuring small diameter sources by inserting tungsten liners. A fixed holder is provided to locate the ion chamber in the lower compartment with its centre 1 meter below the face of the activity.



FIELD SIZES FOR SOURCE DIAMETERS
(SEE TABLE)



NOTE:
ALL DIMENSIONS IN CENTIMETRES

	SOURCE DIA	FIELD SIZES
A	2.5	4.36
B	2.0	4.99
C	1.5	5.69
D	1.0	6.37

Details for this sketch are taken from drawing A10801.

Atomic Energy of Canada Limited • Commercial Products
Ottawa · Canada

EQUIPMENT CONVERSION RATIOS FOR AECL THERAPY UNITS

Equipment Conversion Ratio is the ratio of unit output at one metre to source output at one metre. It is a function of the field size setting of the collimator.

For AECL Units, Equipment Conversion Ratios are defined at maximum field size.

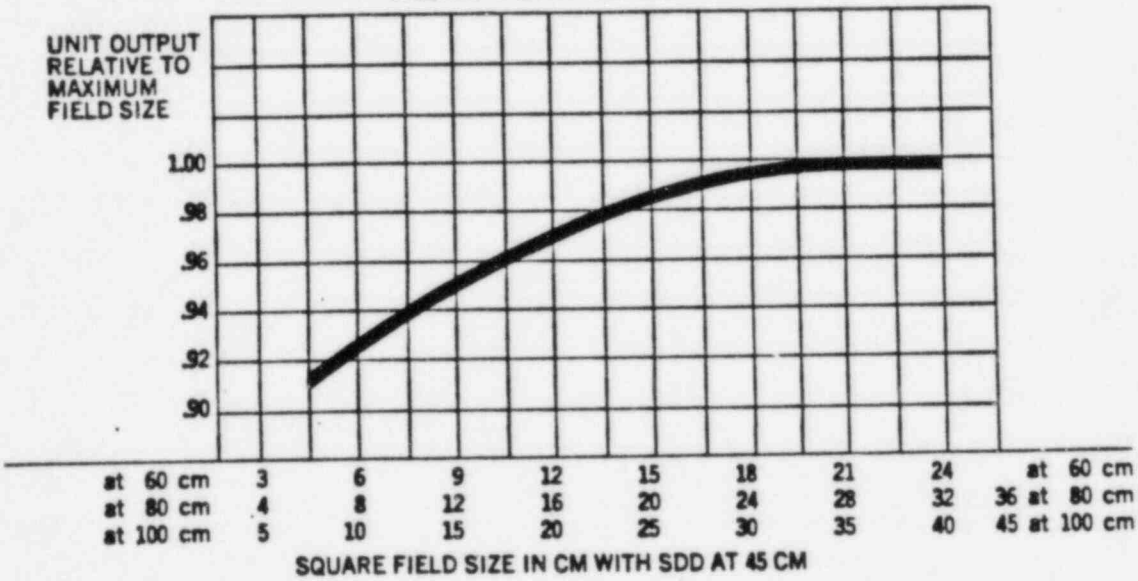
THERAPY UNIT	EQUIPMENT CONVERSION RATIO*
** ELDORADO A	1.15
** MODEL B, C, C11, F, G & SUPER G	1.09
***MODELS 6, 60, 8, 80, 76, 78, 765 & 780	1.15

* Equipment Conversion Ratio to convert certified source Rmm to unit output at one metre, and maximum field size.

** Older AECL units having a shutter and a source in a square drawer.

*** AECL units having an interleaved collimator and a source in a round drawer are related by the general unit output curve shown below. The square field sizes depicted for treatment distances of 100, 80 and 60 cm are geometrically related at a trimmer distance (SDD) of 45 cm.

THERAPY UNIT OUTPUT



EQUIPMENT CONVERSION RATIOS are slightly affected by active source dimensions. A correction which does not exceed ±2% will be applied to the exposure rate calculated for the customer's unit.

Atomic Energy of Canada Limited • Commercial Products

Ottawa, Canada

ATOMIC ENERGY OF CANADA LIMITED • COMMERCIAL PRODUCTS

REPORT OF ROUTINE WIPE TEST FOR CONTAMINATION

P&S 42571

IMPORTANT:
Sources shall be tested for leakage at intervals not to exceed six months. Records of test results shall be kept in units of microcuries and maintained for inspection by the appropriate Licensing Authority.

CUSTOMER LOCATION:
William Beaumont Hospital,
3601 W. 13 Mile Road,
Royal Oak, Michigan. 48072

MODEL & SERIAL NO. Siemens Unit

DATE OF TEST(S): _____

DESCRIPTION OF SOURCE(S) TESTED:

Source in Rack ☐
Drawer hole ☐
Collimator ☒

for ^{60}Co ☐ , ^{137}Cs ☐ , ^{238}U ☒

Survey Meter Used: Berthold RATO/F **Serial No.** _____

Instrument Sensitivity:

A		B	
400 c/min	=	0.05 μCi	^{60}Co ☐
1000 c/min	=	0.05 μCi	^{137}Cs ☐
350 c/min	=	0.005 μCi	^{238}U ☐

Calibration Date: _____

Leak Test(s) Performed:

☐ 1. Routine wipe contamination test as detailed in the Facility Instruction and Maintenance Manual or Field Service Instructions.

☐ 2. Other test(s) as described on reverse side.

Gross Wipe Reading = _____ c/min
Background Reading = _____ c/min

Net Wipe Reading = _____ c/min x $\frac{(B)}{(A)}$ _____ $\frac{\mu Ci}{c/min}$ = _____ μCi

Test Evaluation:

☐ 1. NEGATIVE - Test showed less than reportable limit.

☐ 2. POSITIVE - Readings and initial corrective action to be detailed on reverse side.

It is hereby certified that the test(s) indicated above have been carried out under the supervision of the undersigned.
Conversion to S.I. Radiological Units 0.05 μCi = 1.85 kBq and 1 mrem = 10 μSv.

Signed . . . . . .

Date . . . . . *Title* . . . . . .

CONTROL NO. 7 9 2 2 0

ATOMIC ENERGY OF CANADA LIMITED • COMMERCIAL PRODUCTS

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P&S 42571

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CUSTOMER LOCATION:
William Beaumont Hospital,
3601 W. 13 Mile Road,
Royal Oak, Michigan. 48072

MODEL & SERIAL NO. Siemens Unit

DATE OF TEST(S): _____

DESCRIPTION OF SOURCE(S) TESTED:

Source in Rack ☐
Drawer hole ☒
Collimator ☐

for ^{60}Co ☒ , ^{137}Cs ☐ , ^{238}U ☐

Survey Meter Used: Berthold RATO/F Serial No. _____

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Signed . . . . . .

Date . . . . . *Title* . . . . . .

ATOMIC ENERGY OF CANADA LIMITED • COMMERCIAL PRODUCTS

RADIATION SURVEY REPORT

Teletherapy Head - Beam Off

P&S 42571

Customer: William Beaumont Hospital,

Location: 3601 W. 13 Mile Road, Royal Oak, Michigan. 48072

Model: Siemens Unit

Serial Number: -

SOURCE DATA

Serial No. S-3391 Diameter 2.0 cm Curies 7961 Cobalt 60

Measured Output 141.7 (±3%) Rmm(ICRU) Measurement Date 15 June 1982

Maximum Unit Output - Rmm Rated Capacity - Rmm(ICRU)

Survey Meter _____ Model _____

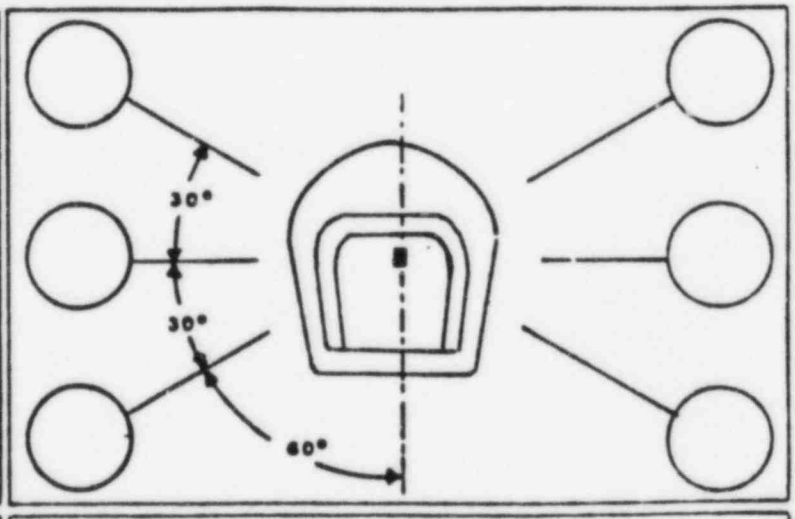
Serial No. _____ Calibration Date _____

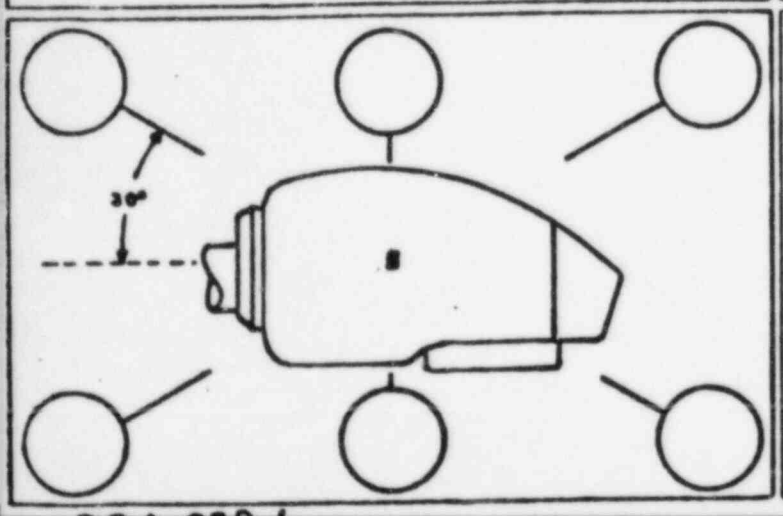
Supplementary Shielding: Donut ☐ Air Cylinder End ☐ Other ☐

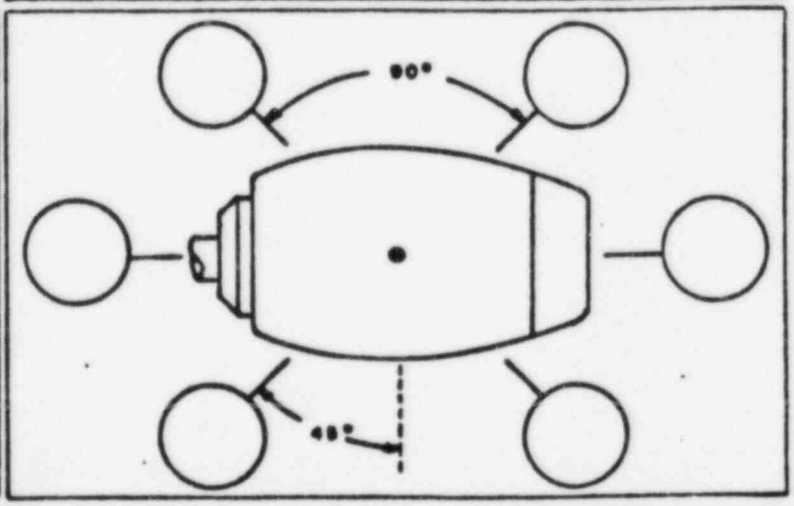
Facility Survey Performed by _____ Date _____

Comments

Measurements in mR/h at 1 metre from the source.







Atomic Energy of Canada Limited
L'Énergie Atomique du Canada, Limitée

Commercial Products
Produits Commerciaux

P.O. Box 6300
Ottawa, Canada
K2A 3W3

C.P. 6300
Ottawa, Canada
K2A 3W3

Tel. (613) 592-2790
Telex. 053-4162

☐ AGREEMENT ☒ NON-AGREEMENT STATE

NOTIFICATION OF FIELD WORK P&S 42571

SITE: William Beaumont Hospital, 3601 W. 13 Mile Road, Royal Oak, Michigan. 48072

CALL: Mr. Don Sreniawski at 312-932-2500, Region III USNRC Office of Inspection & Enforcement, 799 Roosevelt Road, Glen Ellyn, Illinois. 60137

TYPE OF WORK TO BE DONE: (SUBJECT TO USNRC APPROVAL)

To install the AECL Cobalt 60 source serial number S-3391 into the Siemens unit located in Royal Oak, Michigan.

DATE(S) OF WORK TO BE DONE:

ACTIVITY: 7,961 curies of Cobalt 60 as of 15 June, 1982

AECL FIELD WORK LICENSE(S): USNRC 54-00300-04
SHIPPING LICENSE(S): CDN/E-23/Rev. 3 See Note Below

AUTHORIZED TECHNICIAN(S): Steve Johnson

SERVICE TECHNICIAN WILL CARRY TO THE SITE AND WILL ADHERE TO:

1. Copy of license(s)
2. Installation/Service/Shipping Procedure(s)
3. Berthold Rato/F Survey Instrument
4. Personal dosimeters (2)
5. TLD Waist Badge
6. 10 CFR 19
7. 10 CFR 20
8. Wipe Test Materials and Routine Leak Test Report
9. All documents referenced on license(s)
10. Form NRC-3 : Notice to Employees.
11. Pertinent Documentation re: Shipping Container(s)
12. On-site Inspection Report
13. Industrial Code Rule 38 - N.Y. State

RADIATION SURVEY OF UNIT/FACILITY:

To be left with or forwarded to customer within 30 days of installation.

NOTIFICATION PREPARED BY J. Stirling DATE: 1982 August 16

NOTIFICATION MADE BY _____ DATE: _____

NFW-2 1981-5-4

CONTROL NO. 7 9220

NOTE: USDOT Certificate No. _____ is for direct export to Canada - not for domestic use

Teletherapy Source Drawer Warranty

(for North American Installations)

Atomic Energy of Canada Limited, hereinafter called "the Company", warrants that the Source Drawer of the Company-manufactured teletherapy unit in which a replacement source is installed by the Company or its authorized representatives will not seize in the source head for a period of 5 years from date of its installation (hereinafter called "the warranty period").

In the event that a Source Drawer should seize during the warranty period, the Company will, within the limitations described in this warranty, return the Source Drawer to its proper operating condition.

This warranty is subject to the following conditions:

1. The warranty is non-transferable and is valid only in North America and only if issued by the Company or its authorized representatives.
2. The warranty shall become void in the event of improper maintenance of the teletherapy unit, sale, modification, movement of the teletherapy unit or repair of the teletherapy unit source head in which the Source Drawer is installed by other than the Company or its authorized representative.
3. The obligations of the Company under this warranty shall consist solely of returning the Source Drawer to proper operating condition within a reasonable time.
4. The customer must carry out periodic maintenance checks for early detection of Source Drawer seizure.
5. The customer will immediately notify the Company of a Source Drawer seizure.
6. This warranty does not include failure of the Source Drawer to operate due to malfunctions of the Source Drawer drive system and related electronics/electrical controls.

Limitations of Warranty

The Company will not be responsible for:

1. Loss of use of the teletherapy unit.
2. Any ill effects or injuries to any person as a result of the Source Drawer seizure.
3. Damage to the Source Drawer caused by any person not acting on the behalf of the Company or by any act of God, war, fire, strikes, plots, conspiracy, sabotage, or vandalism.
4. Additional costs, not covered by any express warranty by the Company, for repairs of the Source Drawer drive system and related electronic/electrical controls.
5. There are no representations or warranties with respect to the Source Drawer other than as contained herein.

Atomic Energy of Canada Limited, Commercial Products

P.O. Box 6300, Ottawa, Canada, K2A 3W3

MED 77 2 78

Cobalt 60 Teletherapy Source Warranty

(for North American Installations)

Atomic Energy of Canada Limited, hereinafter called "the Company", warrants that its Cobalt 60 Teletherapy Source (hereinafter called the "Source") is and shall be free from defects in material and workmanship and shall contain its radioactive content without leakage for a period of 15 years from the date of installation thereof by the Company or its authorized representatives in a Company-manufactured teletherapy unit or until the Source is removed from such unit, whichever occurs first (hereinafter called "the warranty period").

In the event that the Source should become defective during the warranty period, the Company will remove and replace the Source and remove, within the limitations described in this warranty, any radioactive contamination caused by the defective Source.

This warranty is subject to the following conditions:

1. The warranty is non-transferable and is valid only in North America and only if issued by the Company or its authorized representatives.
2. The warranty shall become void in the event of improper maintenance, sale, modification or movement of the teletherapy unit or repair of the teletherapy unit source head in which the Source is installed by other than the Company or its authorized representatives.
3. The obligations of the Company under this warranty shall consist solely of replacement of the Source with one of equivalent or greater output at the time the warranty is invoked by the customer and of decontamination of the teletherapy unit and the treatment room in which the Source is installed to an acceptable radiation level as defined in this warranty.
4. The customer must carry out routine wipe tests as prescribed by local licensing authorities, and in no event shall such tests be less than those described in the Instruction Manual of the teletherapy unit.
5. The customer will immediately notify the Company if a Source is suspected of leakage during routine wipe tests.

Decontamination

In the event of radioactive contamination caused by a defective Source, the Company will decontaminate (within a reasonable time) the teletherapy unit and treatment room within the following limitations:

For Fixed Contamination

The maximum and average radiation levels at 1 cm from any contaminated surface shall not exceed 1.0 and 0.2 mR/h respectively when measured with a beta-gamma survey meter through a tissue equivalent absorber of not more than 7 mg/cm^2.

For Removable Contamination

The maximum amount of radioactivity removable from a 100 cm^2 surface area by wiping that area with a dry filter or soft absorbent paper shall not exceed 185 becquerel (0.005 microcuries).

Limitations of Warranty

The Company will not be responsible for:

1. Loss of use of the teletherapy unit.
2. Any ill effects or injuries to any person by the radioactive materials pertaining to the Source and teletherapy unit.
3. Damage to the Source caused by any person not acting on behalf of the Company or by any act of God, war, fire, strikes, plots, conspiracy, sabotage, or vandalism.
4. Losses or additional costs incurred by the customer during any period of clean-up.
5. Damages caused by or removal of any radioactive contamination being transported outside of the treatment room.
6. There are no representations or warranties with respect to the Source other than as contained herein.

Atomic Energy of Canada Limited, Commercial Products
P.O. Box 6300, Ottawa, Canada, K2A 3W3

MED 76 2/78

TEXAS STATE DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Pursuant to the Texas Radiation Control Act and Texas State Department of Health regulations on radiation, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Texas State Department of Health, now or hereafter in effect and to any conditions specified below.

LICENSEE

1. Name: Clyde D. Peabody

2. Address: 904-06 Pennsylvania Avenue
Fort Worth, Texas 76101

3. License No. 2-1485

4. Expiration date: August 31, 1973

5. Radioactive material (element and mass number)	6. Chemical and/or physical form	7. Maximum amount of radioactivity which licensee may possess at any one time
A. Cobalt 60	A. Teletherapy Sealed Sources	A. 10,000 curies
B. Cesium 137	B. Teletherapy Sealed Sources	B. 1,000 curies

8. Authorized use

A. and B. To be stored and used in a transfer cask and teletherapy head as necessary to the installation and replacement of a source in a Picker X-Ray Corporation, Keleket-Barnes, or AECL teletherapy unit.

CONDITIONS

9. The authorized place of use is at the teletherapy facilities of customers who possess a valid Radioactive Material License for the teletherapy sources that are being transferred.

10. The licensee shall comply with the provisions of Part 21, "Standards for Protection Against Radiation" of Texas Regulations for Control of Radiation.

11. Radioactive material shall be used by, or under the supervision and in the physical presence of Clyde D. Peabody.

12. A. Teletherapy sources shall be tested for leakage before and after installation in accordance with procedures contained in applicatio dated August 10, 1970.

(See page 2)

CONTROL NO. 79220

TEXAS STATE DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

Continued from page 1 License No. 2-1485

CONDITIONS

12. B. The tests shall be sufficiently sensitive to detect 0.05 microcurie of contamination on the test sample.

C. The test sample shall be taken from selected accessible surfaces of the teletherapy head. The selected accessible surfaces should be those surfaces on which one might expect contamination (if there were to be leakage) to accumulate and shall include the inner surface of the most frequently used beam collimating device. The test sample shall be taken with the source in the "off" position.

D. If the test reveals the presence of 0.05 microcurie or more of removable contamination, the licensee shall promptly take action to prevent spread of contamination, and shall file a report within five days of receipt of test results with:

Division of Occupational Health
and Radiation Control
Texas State Department of Health
1100 West 49th Street
Austin, Texas 78756
ATTN: Supervisor, Compliance and Inspection
Radiation Control Program,

describing the test results and the corrective action taken.

13. Teletherapy sources shall be installed in accordance with the procedure contained in instructions entitled "Loading and Unloading of Co-60 Source Capsules in Medical Units" as submitted with application. The results of the radiation survey and the check of the safety devices shall be provided the customer after their completion.

14. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 5, 6 and 7 of this license in accordance with statements, representations and procedures contained in application dated August 10, 1970 and attachments thereto.

For the Texas State Department of Health

David K. Lacker
Licensing and Registration
Radiation Control Program

Supervisor

Date AUG 17 1970

(10-69)

TEXAS STATE DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

License No. 2-1485
AMENDMENT NO. 1

Clyde D. Peabody
904-06 Pennsylvania Avenue
Fort Worth, Texas 76101

In accordance with letter dated April 13, 1971, signed by Clyde D. Peabody, License No. 2-1485 is hereby amended as follows:

To add Condition 15 to read:

15. The licensee is authorized to transport the radioactive material covered by this license throughout the State of Texas in accordance with statements, representations, and procedures contained in letter dated April 13, 1971, signed by Clyde D. Peabody.

For the Texas State Department of Health

Date APR 19 1971

Licensing and Registration
Radiation Control Program

Supervisor

(10 69)

TEXAS STATE DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

License No. 5-1485

AMENDMENT NO. 2

Clyde D. Peabody
904-06 Pennsylvania Avenue
Fort Worth, Texas 76101

In accordance with telegram dated October 15, 1971, sent by Clyde Peabody, License No. 5-1485 is hereby amended as follows:

Parts A. and B. of Item 8 are amended to read:

8. Authorized use

A. and B. To be stored and used in a transfer cask and teletherapy head as necessary to the installation add replacement of a source in a Picker X-Ray Corporation, Keleket-Barnes, AECL, or Bar-Ray teletherapy unit.

Item 3, the License No., is changed from 2-1485 to 5-1485 as shown above.

For the Texas State Department of Health

Date OCT 18 1971

Joseph E Bonnell

Licensing and Registration
Radiation Control Program

Supervisor

CONTROL NO. 79220

TEXAS STATE DEPARTMENT OF HEALTH

RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

License No. 5-1485
AMENDMENT NO. 3

817-429-5099

Clyde D. Peabody
X-Ray Equipment Company
904-06 Pennsylvania Avenue
Fort Worth, Texas 76101

In accordance with letter dated March 7, 1972, signed by Clyde D. Peabody, License No. 5-1485, is hereby amended as follows:

Parts A. and B. of Item 8 are amended to read:

8. Authorized use

A. and B. For storage and transport in transfer cask and for installation in teletherapy heads in Picker X-Ray Corporation, Keleket-Barnes, AECL, Bar-Ray, Dick Comando, and Elema-Schoenander teletherapy units.

For the Texas State Department of Health

MAR 9 1972

Date

Joseph E Gorrell

Licensing and Registration / Supervisor
Radiation Control Program

TEXAS STATE DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

License No. 5-1485
AMENDMENT NO. 4

Clyde D. Peabody
X-Ray Equipment Company
904-06 Pennsylvania Avenue
Fort Worth, Texas 76101

In accordance with letter dated May 17, 1972, signed by Clyde D. Peabody, License No. 5-1485 is hereby amended as follows:

Parts A. and B. of Item 8 are amended to read:

8. Authorized use

A. and B. For storage and transport in transfer cask and for installation in teletherapy heads in Picker X-Ray Corporation, Keleket-Barnes, Westinghouse, AECL, Bar-Ray, Dick Comando, and Elema-Schoenander teletherapy units.

For the Texas State Department of Health

Date MAY 19 1972

Joseph E. Gurell
Licensing and Registration Supervisor
Radiation Control Program

(10 69)

TEXAS STATE DEPARTMENT OF HEALTH

RADIOACTIVE MATERIAL LICENSE AMENDMENT NO. 5

Pursuant to the Texas Radiation Control Act and Texas State Department of Health regulations on radiation, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Texas State Department of Health, now or hereafter in effect and to any conditions specified below.

LICENSEE	
1. Name X-Ray Equipment Company	In accordance with letter dated August 13, 1973
2. Address 904-06 Pennsylvania Avenue Fort Worth, Texas 76101	3. License No. 5-1485 is hereby amended in its entirety to read as follows:
	4. Expiration date August 31, 1976

5. Radioactive material (element and mass number)	6. Chemical and/or physical form	7. Maximum amount of radioactivity which licensee may possess at any one time
A. Cobalt 60	A. Teletherapy Sealed Sources	A. 10,000 curies
B. Cesium 137	B. Teletherapy Sealed Sources	B. 10,000 curies

8. Authorized use

A. and B. For temporary storage and transport in transfer casks and for installation and replacement of teletherapy sources as authorized by specific conditions of this license.

CONDITIONS

9. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.

10. The licensee is authorized to install or replace teletherapy sources throughout the State of Texas for customers who are properly licensed to receive such sources.

11. The licensee shall comply with the provisions of Part 21, "Standards for Protection Against Radiation" of Texas Regulations for Control of Radiation.

12. Radioactive material shall be used by, or under the supervision and in the physical presence of Clyde D. Peabody.

13. Teletherapy sources shall be tested for leakage before and after installation in accordance with procedures contained in application dated August 10, 1970 and the customer shall be provided a copy of the results of such tests.

CONTROL NO. 9220

(L-72)

TEXAS STATE DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

License No. 5-1485
AMENDMENT NO. 5

Continued from page 1

CONDITIONS

14. Radioactive material shall be transported in accordance with U.S. Department of Transportation regulations.

15. Teletherapy sources shall be installed in accordance with the manufacturer's technical instructions and the instructions entitled "Loading and Unloading of Co-60 Source Capsules in Medical Units" as submitted with application dated August 10, 1970.

16. The licensee is authorized to install or replace sources only in Picker X-Ray Corporation, Keleket-Barnes, Westinghouse, AECL, Bar-Ray, Dick Commando, and Elma-Schoenander teletherapy units for which he has technical instructions.

17. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 5, 6 and 7 of this license in accordance with statements, representations and procedures contained in application dated August 10, 1970 and letters dated April 13, 1971 and August 13, 1973.

For the Texas State Department of Health

Joseph E. Gorell

Licensing Supervisor
Radiation Control Program

Date AUG 21 1973

(4-74)

TEXAS STATE DEPARTMENT OF HEALTH

RADIOACTIVE MATERIAL LICENSE CORRECTED COPY

Supplementary Sheet

License No. 5-1485

AMENDMENT NO. 6

X-Ray Equipment Company
904-06 Pennsylvania Avenue
Fort Worth, Texas 76101

In accordance with letters dated January 15, 1976, and February 5, 1976, signed by Clyde D. Peabody and Jack Morgan respectively, License No. 5-1485 is hereby amended as follows:

To change Condition 12 to read:

12. Radioactive material shall be used by, or under the supervision and in the physical presence of, Clyde D. Peabody and/or Jack M. Morgan, C.R.P.

To add Condition 18 to read:

18. The licensee is authorized to perform the 5-year inspection and maintenance servicing on the teletherapy units specified in Condition 16 in accordance with the procedures submittted February 5, 1976.

For the Texas State Department of Health

Joseph E. Gorell Chief

Licensing
Radiation Control Branch

Date FEB 13 1976

TEXAS DEPARTMENT OF HEALTH RESOURCES

RADIOACTIVE MATERIAL LICENSE

CORRECTED COPY

Supplementary Sheet

X-Ray Equipment Company
904-906 Pennsylvania Avenue
Fort Worth, Texas 76101

LICENSE NUMBER	AMENDMENT NO
5-1485	7

In accordance with letter dated August 10, 1976, signed by Clyde D. Peabody, License No. 5-1485 is hereby amended as follows:

To extend the expiration date, Item 4, from August 31, 1976, to August 31, 1979.

FOR THE TEXAS DEPARTMENT OF HEALTH RESOURCES

Date OCT 18 1976

Joseph E Gowell

Chief of Licensing
Radiation Control Branch

CONTROL NO. 79220

TEXAS DEPARTMENT OF HEALTH RESOURCES

RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NO
5-1485	8

X-Ray Equipment Company
904-906 Pennsylvania Avenue
Fort Worth, Texas 76101

In accordance with letters dated November 16, 1977, January 23, 1978 and February 24, 1978 all signed by Jack M. Morgan, License No. 5-1485 is hereby amended as follows:

To add Part C to Items 5, 6, 7 and 8 to read:

5. Radioactive material (element and mass number)	6. Chemical and/or physical form	7. Maximum amount of radioactivity which licensee may possess at any one time
C. Radium 226	C. Sealed Sources	C. 500 millicuries

8. Authorized Use

C. For receipt, temporary storage and transfer to authorized recipients in accordance with the conditions of this license.

To add Condition 19 and 20 to read as follows:

19. Radium 226 sources shall be tested for leakage before transfer to authorized recipients in accordance with the provision of Section 11.7(c) of the Texas Regulations for Control of Radiation and procedures contained in letter dated February 24, 1978, signed by Jack M. Morgan.

20. The licensee shall maintain a record for inspection by the Agency of each Radium 226 source transfer. The record shall include the name and radioactive material license number of the authorized recipient and the date of the transfer and the identity and quantity of the sources transfered.

FOR THE TEXAS DEPARTMENT OF HEALTH RESOURCES

Date MAR 1 4 1978

Joseph Gwill

Chief of Licensing
Radiation Control Branch

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Pursuant to the Texas Radiation Control Act and Texas Department of Health regulations on radiation, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Texas Department of Health now or hereafter in effect and to any conditions specified below.

LICENSEE

1. Name: X-Ray Equipment Company
   ATTN: C. D. Peabody
2. Address: 904-906 Pennsylvania Avenue
   P.O. Box 2431
   Fort Worth, Texas 76101

This license issued pursuant to and in accordance with:
☒ APPLICATION ☐ LETTER ☐
Dated: January 25, 1980
Signed By: C. D. Peabody

3. License Number: 5-1485
Amendment Number: 9

PREVIOUS AMENDMENTS ARE VOID

4. Expiration Date: March 31, 1983

RADIOACTIVE MATERIAL AUTHORIZED

5. Radioisotope	6. Form of Material	7. Maximum Activity*	8. Authorized Use
A. Co-60	A. Teletherapy Sealed Sources	A. 15,000 Ci.	A. and B. For temporary storage and transport in transfer cask and for installation and replacement of teletherapy sources as authorized by specific conditions of this license.
B. Cs-137	B. Teletherapy Sealed Sources	B. 2,000 Ci.	B. See A above

☒ CONTINUED ON PAGE 2, IF CHECKED.

CONDITIONS

9. Radioactive Material may be stored only in a shielded condition at the licensed address as shown in Item 2 above.

10. The licensee is authorized to transport, in accordance with U.S. Department of Transportation regulations, and install or replace teletherapy sources throughout the State of Texas for customers who are properly licensed to receive such sources.

11. The licensee shall comply with the provisions of Parts 11, 21, 22 and 4 of the Texas Regulations for Control of Radiation.

* Ci-Curies mCi-Millicuries μCi-Microcuries

CONDITIONS CONTINUED ON PAGE 2

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1485	9

5. Radio-isotope	6. Form of Material	7. Maximum Activity	8. Authorized Use
C. Ra-226	C. Sealed brachytherapy sources	C. 700 mgm	C. thru E. For receipt, temporary storage and transfer to authorized recipients in accordance with the conditions of this license.
D. Cs-137	D. Sealed brachytherapy sources	D. 200 mCi.	D. See C above.
E. Co-60	E. Sealed brachytherapy sources	E. 200 mCi.	E. See C above.

CONDITIONS CONTINUED:

12. Radioactive material shall be used by, or under the supervision and in th physical presence of Clyde D. Peabody and/or Jack M. Morgan, C.R.P.

13. The individual designated to perform the functions of Radiation Safety Officer for activities covered by this license is Clyde D.Peabody.

14. Sealed sources containing radioactive material shall not be opened.

15. Customers shall be provided with a current leak test certificate for any sealed source delivered. Teletherapy leak test samples shall be obtained before and after installation of the source, and the customer provided with the results of both tests. Such leak tests shall be performed by Jack Morgan or other persons specifically so authorized by the Agency, another Agreement State, or the U.S. Nuclear Regulatory Commission.

CONTINUED ON PAGE 3

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1485	9

CONDITIONS CONTINUED:

16. Teletherapy source installation and the five (5) year inspection and maintenance servicing shall be in accordance with the manufacturer's technical instructions, the instructions entitled "Loading and Unloading of Co-60 Source Capsules in Medical Units" submitted with application dated January 25, 1980, and letter dated February 21, 1980.

17. The licensee is authorized to install or replace sources and/or perform the five (5) year inspection and maintenance servicing on AECL, Picker, Westinghouse, Keleket, Dick Commando, Elema-Schonander, Siemens, Philips, Toshiba and/or TEM teletherapy units for which he has the technical instructions.

18. Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in application dated January 25, 1980, letter dated February 2, 1980 and all correspondence amending the application which results in an amendment to the license.

FOR THE TEXAS DEPARTMENT OF HEALTH

Date MAR 6 1980

Joseph E. Gonzell
Chief of Licensing
Radiation Control Branch

TEXAS DEPARTMENT OF HEALTH

RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1485	10

-Ray Equipment Company
tn: C. D. Peabody
04-906 Pennsylvania Avenue
O. Box 2431
ort Worth, Texas 76101

accordance with telegram dated August 20, 1980, sent by Clyde Peabody, Li-
ense No. 5-1485 is hereby amended as follows:

change Condition 9 to read:

Radioactive materials may be temporarily stored in a shielded condition at 2424 Blue Smoke Court and at 904-906 Pennsylvania Avenue, both in Fort Worth.

FOR THE TEXAS DEPARTMENT OF HEALTH

Joseph E Gorell

Chief of Licensing
Radiation Control Branch

Date SEP 08 1980

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1485	11

X-Ray Equipment Company
ATTN: C. D. Peabody
904-906 Pennsylvania Avenue
P.O. Box 2431
Fort Worth, Texas 76101

In accordance with letter dated February 1, 1983, signed by Clyde D. Peabody, License No. 5-1485 is hereby amended as follows:

To extend the expiration date, Item 4, from March 31, 1983, to March 31, 1988.

JEG:ksa

FOR THE TEXAS DEPARTMENT OF HEALTH

Joseph E Gonell

Date February 10, 1983

CONTROL NO. 79220

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1485	12

X-Ray Equipment Company
ATTN: C.D. Peabody
904-906 Pennsylvania Avenue
P.O. Box 2431
Fort Worth, Texas 76101

In accordance with letter dated June 9, 1983, signed by Clyde D. Peabody, License No. 5-1485 is hereby amended as follows:

To change Condition 12 and add Condition 19 to read:

12. Radioactive material shall only be used by, or under the supervision and in the physicial presence by Clyde D. Peabody, Jack M. Morgan, C.R.P., Jerry L. Fogle or Leslie F. Forrest.

19. Radiation survey instruments shall be calibrated at intervals not to exceed 12 months by persons licensed by the Agency, another Agreement State, or by the U.S. Nuclear Regulatory Commission. Radiation survey instruments which are routinely transported shall be calibrated at least every six months.

JRS:dcw

FOR THE TEXAS DEPARTMENT OF HEALTH

Joseph E. Gonell

Date June 23, 1983

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1485	13

X-Ray Equipment Company
ATTN: C.D. Peabody
904-906 Pennsylvania Avenue
P.O. Box 2431
Fort Worth, Texas 76101

In accordance with letter dated September 30, 1983, signed by C. Peabody, License No. 5-1485 is hereby amended as follows:

To change Condition 12 to read:

12. Radioactive material shall only be used by, or under the supervision and in the physical presence by Clyde D. Peabody, Jack M. Morgan, C.R.P., Jerry L. Fogle, Leslie F. Forrest, or William H. Dederichs.

JRS:dcw

FOR THE TEXAS DEPARTMENT OF HEALTH

Joseph R. Gonell

Date October 26, 1983

(10-78)

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1485	14

X-Ray Equipment Company
ATTN: Clyde Peabody
2601-05 Ludelle Street
P.O. Box 2431
Fort Worth, Texas 76113-2431

In accordance with letters dated January 24, 1984 and August 21, 1984, both signed by Clyde D. Peabody, License No. 5-1485 is hereby amended as follows:

To change Item 2, the address, to read as above.

To change Conditions 9 and 12 to read:

9. Radioactive material may be stored in a shielded condition only at 2424 Blue Smoke Court, Fort Worth, Texas.

12. Radioactive material shall only be used by, or under the supervision and in the physical presence by Clyde D. Peabody, Jack M. Morgan, C.R.P., Jerry L. Fogle, Leslie F. Forrest, Richard H. Tanker, or William H. Dederichs.

JEG:ksa

FOR THE TEXAS DEPARTMENT OF HEALTH

Date September 14, 1984

Joseph E. Gonell

Administrator, Medical and Academic Branch

C FORM 41-3a
(10-78)

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1485	15

Ray Equipment Company
TN: Clyde Peabody
01 Ludelle Street
O. Box 2431
rt Worth, Texas 76113-2431

accordance with letters dated January 24, 1984 and December 18, 1984, gned by Clyde D. Peabody and letter dated February 7, 1985, signed by Danny Peabody, License No. 5-1485 is hereby amended as follows:

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change Conditions 9, 12 and 18 to read:

A. Radioactive material may be stored in a shielded condition only at 2601 Ludelle Street in Forth Worth, Texas.

B. The former use location, 2424 Blue Smoke Court in Fort Worth, remains the responsibility of the licensee.

Radioactive material shall only be used by, or under the supervision and in the physicial presence of the following:

Clyde D. Peabody
Jack M. Morgan, C.R.P.
Jerry L. Fogle
Leslie F. Forrest
Richard H. Tanker
William H. Dederichs
Danny M. Peabody

Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in the following:

application dated January 25, 1980.
telegram dated August 20, 1980.
letters dated February 2, 1980, February 1, 1983, June 9, 1983, September 30, 1983, January 24, 1984, August 21, 1984, December 18, 1984, February 7, 1985.

The Texas Regulations for Control of Radiation shall prevail over statements contained in the above documents unless such statements are more restrictive than the regulations.

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mrb

FOR THE TEXAS DEPARTMENT OF HEALTH

Joseph E. Gorell

CONTROL NO. 79220

February 28, 1985

Administrator, Medical and Academic Branch

COPY

LOADING AND UNLOADING OF Co - 60 SOURCES CAPSULES IN MEDICAL UNITS

1. A wipe test is made on the assessable collimator surfaces of Co-60 unit to be loaded.

2. A survey of the head is made of the Co-60 unit to be loaded.

3. Unit is placed in loading position and the storage pig is coupled to the Co-60 head with proper adaptors for the specific unit.

4. The Co-60 room is vacated by all people except the loading team (1 to 2 people).

5. A survey meter is placed at coupling site.

6. The old source is removed into the storage pig.

7. The storage pig is uncoupled.

8. The Co-60 head is then serviced to insure proper mechanical and electrical operation.

9. The storage pig is again coupled as in Item 3, 4 and 5.

10. The new source is placed in Co-60 head.

11. The storage pig is then un-coupled.

12. A survey is made of head.

13. A wipe test is made on collimator surfaces of head containing new source.

14. A complete check is made of the mechanical and electrical components of the unit.

15. A survey is made of the room and surrounding areas.

16. All safety devices are checked.

The head storage pig acts as a shield for the personnel doing the loading and unloading. "Dummy runs" are made to check for clearance of the source before unloading and loading. Direct pocket reading dosimeters and film badges are worn by all personnel associated with loading or unloading process.

The loading and unloading procedure are scheduled for a time of least activity in the area. This is usually after working hours or on the week-end.

In the unlikely event the source gets stuck during the loading or unloading procedure, the room is evacuated and the situation is evaluated. Portable head shields would then be moved into place and fault would be corrected.

COPY

PROCEDURES FOR LEAK TESTING COBALT-60 TELETHERAPY SOURCES

1. With the source in the "off" position accessible selected areas of the teletherapy head are wiped with cotton swabs moistened with a detergent. The selected surfaces are those areas on which one might expect contamination to accumulate.

2. The swabs are then counted in a scintillation detector system against a calibrated Co-60 standard of known activity.

Apply formula:

$$\text{microcuries of Co-60 (leakage)} = \frac{\text{Co-60 swab counts}}{\text{Co-60 standard counts}}$$

3. If test reveals the presence of 0.005 microcuries or more of removable contamination, the licensee shall promptly take action to prevent spread of contamination.

Telephone Information
Radiation Control Program
Texas State Department of Health

Monday thru Friday (8:00 a.m. to 5:00 p.m.) 512-454-3781, Ext. 241

Holidays, nights, and weekends (order of call)

1. Larry J. Stephenson ---------- 512-451-4806
   Assistant Supervisor, Compliance & Inspection

2. Joseph M. Nanus ---------- 512-926-0498
   Supervisor, Registration

3. David K. Lacker ---------- 512-295-3026
   Chief, Radiation Control Program or 512-442-1871

4. Martin C. Wukasch ---------- 512-465-5437
   Director, Division of Occupational Health
   and Radiation Control

If necessary, you may request that one of the above individuals be located by contacting:

Texas Department of Public Safety ---------- 512-452-0331

CONTROL NO. 7 9 2 2 0