

**NORTHWEST
COMMUNITY
HOSPITAL**

DEPARTMENT OF RADIOLOGY
OFFICE OF RADIATION SAFETY & MEDICAL PHYSICS
J. M. PAUL, Ph.D., D.A.B.R., CHIEF PHYSICIST
AND RADIATION PROTECTION SUPERVISOR
RICHARD F. KOCH, M.S., D.A.B.R.
P. C. PHILIP, M.S.

January 16, 1986

Nuclear Regulatory Commission
Region III
799 Roosevelt Road, Bldg. 4
Glen Ellyn, IL 60137

Attn: Ms. Cassandra McDonald

Re: Amendment to NRC License No. 12-13027-02

Dear Ms. McDonald:

We would like to install a bone mineral analyzing device with gadolinium-153 source in our Nuclear Medicine Department. All pertinent information is given below.

1. Names of users:

- i) Constantine S. Soter, M.D., D.A.B.R., F.A.C.R., D.A.B.N.M.
- ii) Harold W. Gianopulos, M.D., D.A.B.R.
- iii) Lee A. Malmed, M.D., D.A.B.R.
- iv) Daniel B. Crane, M.D., D.A.B.R.
- v) Paul A. Bilow, M.D., D.A.B.R.
- vi) S. Chandra Mouli, M.D., D.A.B.R.

All of the above physicians are authorized by the N.R.C. to use Group I, II, III byproduct materials and Xeron-133 for diagnostic purposes. Please refer to our file for their training and experience.

2. Radiation Safety Officer (R.S.O.)

J. M. Paul, Ph.D., D.A.B.R.

R.S.O. is certified in 1974 by the American Board of Radiology in all fields of medical uses of radioisotope and x-rays with special competence in the physics of nuclear medicine. He has over 25 years of experience in the use of radioactive materials. Please refer to our file for details of his training and experience.

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REG3 LIC30
12-13027-02 PDR

CONTROL NO. 80529

Applicant *Jan 22*
Check No. *071499*
Amount/Fee *\$120*
Type of Fee *7.50*
Date Check Rec'd *1/24/86*
Received By *[Signature]*

U.S. NRC
FEE NIGHT DEPT. 11

86 JAN 24 AM 1:13

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January 10, 1986

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3. Scanner for the study of osteoporosis:

Model DP3 of Lunar Radiation Corporation (L.R.C.) of Madison, Wisconsin. NRC-Reg. No is #NR-430-D-101-S. The source holder model number is #DP3-A-SRC--0100-0.

4. Gadolinium-153 Source: (Fig. 1)

Model NER-400 Gd-153 source will be supplied by New England Nuclear. The nominal activity will be 1000 mCi at the time of installation. We would request for a possession limit of 1500 mCi at the time of source replacement. This is due to the fact that the decayed source will remain in the facility before returning to the supplier (NEN) for disposal.

5. Training of the person(s) responsible for source replacement (loading/unloading):

The initial training to the hospital personnel (R.S.O and his assistants) will be provided by the supplier of the scanner (Lunar Radiation Corporation) for at least 8 hours during the time of installation of source in the device by the supplier. Subsequent source replacement will be done by R.S.O. or his assistant under the supervision of the R.S.O.

6. Procedures for loading and unloading of the source in the device (Supplement 1):

The procedures are those provided by the manufacturer of the scanner (Lunar Radiation Corporation). These procedures are given in Supplement 1 and will be strictly followed in all operations.

7. Service and maintenance:

The warranty and out-of-warranty service will be provided by the manufacturer of the device (L.R.C.) or its authorized licensed agent.

8. Source disposal:

The depleted Gd-153 source will be returned to the supplier of the source (NEN) or any NRC authorized/licensed agent of NEN for disposal.

9. Leak test procedure:

This will be done according to the scaled sources leak test procedure we have established in this hospital. (Please refer to our Licenses 12-13027-01 and 12-13027-02 in your file.) The wipes from the source at the time of installation will be taken according to the procedure established by the manufacturer of the device and will be followed subsequently (every six months).

CONTROL NO. 80529

Ms. Cassandra McDonald
Nuclear Regulatory Commission

January 10, 1986

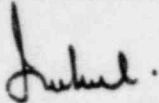
-3-

10. Facility:

This device will be used in the area we have presently allocated for the Department of Nuclear Medicine. (Please refer to Fig. 1 of license renewal application of June 15, 1981.) This area remains always under the surveillance of the authorized Department Personnel. Besides, this scanner is provided with a locking device to maintain the security of the source while in the scanner. During installation and source replacement, the sources will be stored in a lead container, if necessary, within a secured area.

I hope the information supplied is all that you need to amend our license to possess and use L.R.C. DP-3 scanner with Gd-153 source by N.E.N.

Yours sincerely,



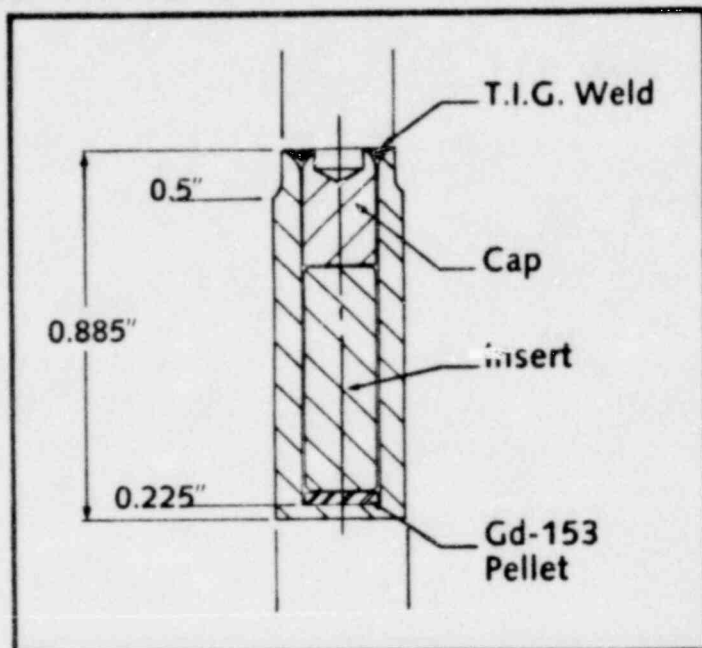
J. M. Paul, Ph.D.

JMP:rg

- Encl. 1) A check for \$120.00 as amendent fee.
2) Fig. 1 (source diagram).
3) Supplement 1 (source loading and unloading procedures).

GADOLINIUM Gd-153 SOURCES

Fig. 1



Specifications

Model Number	NER-430
Capsule Material	Aluminum
Weight	1.5 grams
Dimensions	0.225" Dia. x 0.885" Long
External Radiation:	
@ 5cm	3.0 mR/hr/mCi
@ 30 cm	0.1mR/hr/mCi
ANSI Classification	N542-1977 Performance Class C32312
Pellet	Gadolinium oxide compressed pellet
Activity Tolerance	15% determined by gamma spectroscopy
Leak Test	ANSI N542-1977 A2.1.3 and A2.1.1 Limit $1 \times 10^{-3} \mu\text{Ci}$ Certificate supplied with source

For more complete information or to discuss specific source requirements,
call Customer Service or your Technical Representative toll free
at 800-225-1572 (in Massachusetts (617) 667-9531.)

E. I. du Pont de Nemours & Co., (Inc.), NEN Products, 549 Albany St., Boston, MA 02118
Toll-Free 800-225-1572, In Mass. and International 617-482-9595, Telex 94-0996

Canada: Du Pont Canada Inc. Diagnostic and Bioresearch Systems, 115 Idema Rd., Markham, Ontario L3R 1A9, Tel. (416) 498-9380

Europe: Du Pont de Nemours (Deutschland) GmbH, NEN Division, D-6072 Dreieich, W. Germany, Postfach 401240
Tel: (06103) 803-0, Order Entry: (06103) 803113 Telex: 4-17993 NEN D

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Supplement 1

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C.2 INSTALLING AND REMOVING THE SOURCE

WARNING: Only personnel trained in the principles of radiation safety and protection should conduct these procedures. The technician should study the following procedures before an actual source transfer is attempted. The press-on label with the warning "CAUTION - RADIOACTIVE MATERIALS" should be affixed to the table of the scanner in a location where it can be seen by the operator, patients and/or visitors to the area where measurements are done.

All steps can be conducted without tools. Use of pliers, clamps, etc. in the procedures may cause damage to parts. The "source" consists of a capsule containing gadolinium in solid form (FIG 9). This source is encapsulated in a lead-lined (4mm) brass source holder (FIG 10).

C.2.a. Removing the Source

PROCEDURE

1. Remove pad (if any) and the lucite insert from the table.
2. Use OPTION 5 (Static Counter, User Manual) of the CLUNAR program to position the arm and source at the center of the window.
3. Place a lead source holder cap onto the source collimator (FIG 11).
4. Use the "shutter open" command of OPTION 5. Alternatively the shutter can be manually opened. Be careful to keep hands and other body parts clear of the actual radiation beam. If the shutter is opened manually, do not force the shutter blade to swing more than 35 degrees; then tape the shutter in this (open) position.
5. Turn the chuck ring (FIG 12) counterclockwise until the collimator is loose in the chuck. Do not completely loosen the chuck ring.
6. Pull the source collimator (which will have the source holder attached to the end of it) out of the chuck. The source collimator and holder can now be handled as a unit.
8. Holding the source collimator and source-holder upright (as they were positioned in the scanner), unscrew the source-holder from the collimator. Put a lead cap on the source holder.

CAUTION: RADIATION PRESENT! After the collimator is removed a broad beam of high intensity radiation projects from the top of the source-holder. Exercise due caution.

C.2.b Installing a Source

1. Use the "shutter open" command of OPTION 5. Alternatively the shutter can be manually opened. Be careful to keep hands and other body parts clear of the actual radiation beam. If the shutter is opened manually, do not force the shutter blade to swing more than 35 degrees; then tape the shutter in this (open) position.
2. For new scanners the source holder is provided with the source. The collimator will not have a cap. Remove the collimator from the scanner.
3. Place the lead cap on the source holder onto the brass collimator provided with the scanner. Thread the source holder onto the base of the collimator. Do not force the collimator onto the source holder or it may cross-thread. The source collimator and holder can now be handled as a unit.
4. Slide the source collimator-holder into the source chuck (Fig. 12) so that the pin on the bottom fits into the notch on the source chuck. The collimator shoulder should rest on the top of the chuck (not the chuck ring).
5. Use the "shutter close" command of OPTION 5 or remove the tape if the shutter is held open manually.
6. Verify that the shutter can swing into the notch on the collimator (Fig. 12).
7. Turn the chuck ring clockwise until the collimator is held firmly in the chuck.
8. Remove the source holder cap from the top of the collimator.

CAUTION: A narrow beam of intense radiation is now projected upward from the collimator aperture.
9. Check the shutter for proper operation (User Manual - Standard Scan and QA).
10. Replace the lucite insert (and place the pad on the table). Be sure the lucite insert is placed properly.
11. Monitor radiation levels around the table to insure operator safety.

This completes the source installation procedure.