



E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED

P. O. Box 1217
PARKERSBURG, W. VA. 26101

April 30, 1985

POLYMER PRODUCTS DEPARTMENT

U. S. Nuclear Regulatory Commission
Region II, Material Radiation
Protection Section
101 Marietta St. N.W. Suite 2900
Atlanta, GA 30323

Dear Sirs:

We are hereby submitting an application to amend our NRC Specific License #47-01876-01 to include the following additional sources:

0. Am-241/Be	0. Sealed Source (Gammatron Model AN-HP) or (Amersham Models AMN.18, or AMN.19)	0. Not to exceed 500 millicuries per source
--------------	---	---

We intend to use this source as a Specific Licensee for use in a nondestructive test instrument manufactured for us by Radiation Monitoring Devices, Inc. of Watertown, MA. A description of that device is attached. Appropriate changes in labeling and instructions will be made because we will be qualified as a Specific rather than a General Licensee.

A check for \$60 covering the amendment fee is enclosed. Anything which could be done to expedite the granting of this amendment would be appreciated.

Sincerely yours,

Laurence E. Busch
Radiation Protection Officer

8508120702 850725
REG2 LIC30
47-01876-01 PDR

LEB/sle
(1014E)

Enclosures

You and Du Pont. There's a lot of good chemistry between us.

"Copy of Submission on Glass Analyzer"

Note: Submission by RMD is for General License but provides the data needed for Dupont's Specific License. Labeling on Dupont's device will reflect its use under their Specific License.

APPLICATION FOR REGISTRATION OF A DEVICE

Section I, Summary Data

1. Submission Date: June 14, 1984
2. Device Type: Compuglass
3. Model: Series 200 to 299 with suffixes.
4. Applicant: Radiation Monitoring Devices, Inc.
44 Hunt Street
Watertown, MA 02172
(617) 926-1167
(Manufacturer and Distributor)

Contact: Dr. Gerald Entine, President, or
Mr. Sia E. Afshari, Product Manager.
5. Other companies involved: none.
6. Sealed Source: Am-241/Be neutron source
Gammatron: Model AN-HP with maximum
activity 500 mCi
Amersham: Models AMN.17, AMN.18
AMN.19 with maximum activity 500 mCi.
A source is placed into a container
containing lead and moderator as per attached
drawing #1 in RMD facility.
7. Isotope and Maximum Activity: Americium-241/Beryllium (Am-241/Be)
Maximum Activity: 500 mCi, (3×10^6 neutron per second).
8. Leak Test Frequency: Recommended frequency - 6 months.
9. Principal Use: General Neutron Source Application (H).
10. Custom Device: No.
11. Not Applicable.

Section II Descriptive Data

1. SUMMARY DESCRIPTION

The device is a dedicated gauge designed to measure the glass content of glass-reinforced composites of various forms (pellets, sheet, fluids, etc.). The source is an ANSI standard NRC registered source which is then further shielded and contained in a steel enclosure inside the main case. The device consists of a strong steel case (which contains the source, sample holder, detector, and detector-interface electronics) as well as a separate, off-the-shelf personal computer which analyzes the data. The case dimensions and sample holder vary slightly due to variations in sample requirements, but the general dimensions of the case are 20" wide x 15" deep x 15" high, with maximum dimensions of 30" x 30" x 30. The internal mechanics may be in a horizontal or vertical beam position. This has no effect on any health physics aspect and merely determines the orientation of the sample holder.

The unit's source strength and case dimensions have been chosen so that the radiation levels at all exposed surfaces of the instrument are below the levels requiring the use of a shutter. The case is closed with tamper proof screws to limit access to Radiation Safety Officers and qualified personnel from our company or to those of specific licensees. General licensees will not be issued the special screwdriver for these screws and will not have access to the interior of the box. The tamper proof screws are used for mounting the front and the rear panels of the case to the case body which has no other openings.

2. LABELING

There will be 4 labels on the device. These labels are affixed to the devices as shown in Figures 4 and 5 and are described below.

Label No. 1: A label will be affixed to the front panel which bears the radiation symbol and the words:

"Caution - Radioactive Material
Please read the Instruction Manual
carefully before operating the device."

Label No. 2: The corporate name is on the front and rear panels.

Label No. 3: A label will be affixed to the rear panel which includes the trefoil symbol and which bears the statement:

Caution: Radioactive Material
Isotope: Am-241/Be _____ mCi
Assay Date _____
Wipe test required each 6 months.
(See Instruction Manual.)"

Label No. 4: A label will be silk screened on to the rear panel which bears the statement:

"The receipt, possession, use, and transfer of this device,
are subject to a general license or the equivalent and the

[REDACTED]

regulations of the U.S. NRC or of a state with which the NRC has entered into an agreement for the exercise of regulatory authority. This label and all other labels shall be maintained on the device in a legible condition. Removal of this label is prohibited."

3. DIAGRAM

Attached are diagrams showing the critical components.

4. CONDITIONS OF NORMAL USE

The unit will be typically located in a testing, research, or applications laboratory adjacent to, or in support of, a production line area. The types of users are production line operators, supervisors, engineers, and research personnel, often on a multi-shift basis. The instrument is unlikely to be used as a component in other products. The expected useful life of Am-241/Be is several hundred years. The unit is well-protected against severe conditions since the basic source is a welded stainless steel, NRC registered capsule and it is then contained in a strong steel housing. Thus it is highly fire-resistant.

5. SUPPORTING DATA

The device is a dedicated neutron transmission gauge designed to measure the glass content of glass-reinforced composites of various forms (pellets, sheet, fluids, etc.). The source is an ANSI standard, NRC registered Am-241/Be source which is then further shielded by lead and moderated by hydrocarbons and contained in a steel housing inside the main case. The device consists of a strong steel cfe (which contains the source, sample holder, detector, and detector-interface electronics) as well as a separate, off-the-shelf personal computer which analyzes the data. The case dimensions and sample holder vary slightly due to variations in sample requirements, but the general dimensions of the case are 20" wide x 15" deep x 15" high.

Attached are Figures 2a and 2b which provide detail on the source shielding moderation and casing. Figure 3 is a photo of the assembled unit's exterior.

Section III. Health and Safety Data

1. Safety Analysis Summary

From first principles, the source strength with the shielding provided should produce a low surface level of radiation. Measurements conducted for RMD, Inc., by F. X. Masse Associates, Health Physics Consultants, using calibrated Gamma and Neutron survey meters confirmed these calculations. On all sides of the unit, the radiation level was below .25 mRem/hr at 30 cm and below .1 mRem/hr at 100 cm for neutrons and below 0.1 mRem/hr at 30 cm and much below 0.1 mRem/hr at 100 cm for Gammas. These are below the NRC levels at which film badges are required.

The instrument is a desk top unit and will not ordinarily be exposed to mechanical shock or stress. It also has no moving or electronic parts which affect its safety aspects. In addition, the inner source housing is by itself very strong and is contained in a strong instrument case. Thus the unit is extremely unlikely to emit significant levels of radiation even under very unusual adverse environmental shock or conditions.

2.0. Manufacturing and Distribution Controls - Overview

a) The radiation level is totally determined by the strength of the purchased source capsule and the efficiency of the shielding. The former is formally certified by the source capsule manufacturer while both the former and latter are directly measurable by RMD's survey meter used before shipment.

b) Source Manufacturers Assay Method: The manufacturer of the basic encapsulated source provides formal certification to RMD, traceable to the National Bureau of Standards.

c) Leak Test: The appropriate leak test program for the assembled device consists of the use of a cotton swab wipe test of the nearest accessible surface every six months, in this case, the slider and sample holder.

d) Recommended maintenance: In addition to the wipe test, the source, being a long half-life isotope with no shutter, requires no other monitoring. However proper inventory procedures, so that the location of the instrument is known at all times, are appropriate.

e) Manufacturer's Instructions to User: Certification for the wipe test, source assay, and safe storage will be provided to users. The NRC regulations for General License users will also be reviewed with the user's Plant Safety Officer during installations.

2.1. Manufacturing and Distribution Controls - Detail

a) Quality Assurance and Control: To assure the quality of the products and that of the production units meeting the prototype specifications, the general approach of the QA program in Appendix B of the ANSI N538 guide has been adopted. All units are tested and the acceptance is based on the ability to pass the entire QA testing specifications. Based on the quality control procedures in effect, the QA program is performed in five stages.

1. QA of the Incoming Parts: All the incoming components are tested by the QC department to meet the design specifications. These inspections focus on the observable defect in materials, specified material gauging, physical dimensions, and review of the source and detector manufacturers' support documents. The manufacturer of the basic encapsulated source provides formal certification to RMD, traceable to the National Bureau of Standards.

2. QA of the Source Assembly: The QC department inspects the lead

[REDACTED]

container for physical size and defects. The source locating fixture is checked for positional accuracy and stability. The amount of the moderator used is controlled by preweighing of the moderator prior to putting it into the housing. The sealing of the source housing is inspected.

3. QA of the Unit Assembly: After the unit is assembled, but before the installation of the front and back panels, the device is inspected by QC personnel to insure:

- o That the source housing is sealed and is properly affixed to the main case.
- o That the front panel opening is of the correct size to limit hand access to the interior.
- o That the correct hardware has been used.
- o That the source housing passes wipe test.

Then, the front and back panels are installed and secured with tamper proof screws and a radiation survey test is done to insure that the radiation level at thirty centimeters from all surfaces of the device is below .25 mRem/hr.

3.1 Details of Leak Test: The leak test program in-house is performed by RMD radiation safety officers and it meets the general requirements of ANS, N542 standards. This procedure is outlined below

a. Wiping Procedure: - Each sealed source is carefully swabbed with a cotton-tipped applicator moistened with methanol. The applicator is then counted by placing it close to (about 5mm) a large area (16mm dia.) CdTe detector connected to a PSPI and CTC-4.

b. Calibration Procedure - The sensitivity of the detector is verified by measuring a weak source (e.g., .0003 microcurie) and recording the observed counts above background. This step is essential to demonstrate a sensitivity to at least .005 microcurie, the maximum permissible wipe. To achieve this sensitivity, it is essential to use a small blockhouse of lead bricks to reduce the background count rate to about 1 cps. Typical results give about 1 ct/nCi/s, so that a 100s count time gives ample sensitivity, a 5nCi wipe test would give 600 cts with a poisson error of ± 25 cts and a background of 100 cts.

c. Calibration Procedure - We are required by our license to carry out test which are sensitive to 5nCi of removable radioactivity. This is readily achievable, and should be documented by testing a very weak, sealed source which has decayed to about 1nCi. Typical results give about 1 count/nCi/s, on top of a background of about 1 count/s. The use of a 100 second counting time would thus result in a count of 600 from a 5nCi wipe, with an overall measurement accuracy including statistical noise and background effects of about 5%.

The leak test is applied to the source housing during the assembly of the device and to the sample tray and sample holder after the device is assembled. The records maintained on the leak-test previous to the shipment of the device include:

- o Identification of each source and device (manufacturer, model number, serial number, isotope quantity).
- o Identification of each customer (name, address, person to contact).
- o Radiation survey measurements.
- o Date of test.
- o Information on test methods used.
- o Leak-test results expressed in microcuries of radiation for each area wiped.
- o Identification of the individual who performed the test.

PROPOSED NEW INFORMATION

In the case of finding a leaking source, the source housing will be removed from the device. The source will be taken out of the source housing and will be placed in shielded and moderated drums.

4. QA of Point of Initial Distribution: When the unit is fully assembled and tested, the final QA prior to the shipment is performed to assure that:

- o The leak test documents are present.
- o Tamper proof screws are all in place.
- o The radiation survey of the equipment has been done.
- o All the labels are present.
- o All the supporting documents regarding user instruction are present.

5. QA Check at Customer's Site: All units are installed at customer sites by qualified RMD personnel. During the installation, the device is visually inspected for any possible damage. All the components will be checked to assure the physical integrity is left intact due to the shipment. Then the recommended instruction manual items are reviewed with the user.

b) Recommended Maintenance: The general licensee is instructed in writing to meet the leak test requirements of Sections 31.5(c)(2) and 32.51 (a)(3)(ii) by obtaining a wipe test kit from a commercial distributor who is certified by NRC and to follow the recommended procedure in performing the leak test. The recommended period for leak testing is every six months. The areas of the device to be wiped are the sample holder tray and the sample holder itself. The wipes are then sent back to the commercial test house for measurement. In addition to the wipe test, the source, being a long-life isotope with no shutter, requires no other monitoring.

c) Manufacturer's Instructions to User: The user instruction manual provides a copy of general license contained in part 31.5 of 10.CFR along with leak test procedure and maintenance requirements. Also provided to users is a copy of the certification for the wipe test and the source assay done by the source manufacturer as well as a certification by RMD of the wipe test done at our facility. A copy of the pertinent sections of the users' manual is attached.

3. MANUFACTURER'S SAFETY ANALYSIS OF DEVICE REVIEW

a) Safety Analysis: The ability of the device to withstand both normal and unexpected, rugged conditions arises from the nature of the welded, encapsulated basic source (ANSI Standards) and the 18 gauge steel housing. In addition, the source is then contained inside the heavy gauge steel case. The radiation levels are so low that no measurable aging effects relating to safety are expected.

The instrument is a desk top unit and will not ordinarily be exposed to mechanical shock or stress. It also has no moving or electronic parts which affect its safety aspects. In addition, the inner source housing is by itself very strong and is contained in a strong instrument case. Thus the unit is extremely unlikely to emit significant levels of radiation even under very unusual adverse environmental shock or conditions.

b) Prototype Testing and Evaluation: A prototype was built and tested by outside consultants as described in III-1 above. Attached is a copy of their report.

The device is intended for distribution to persons generally licensed. The radiation levels at 30 cm are low enough (below .25 mRem/hr) that a person would be

~~CONFIDENTIAL - SECURITY INFORMATION~~

below the allowed levels if he were to spend 100 percent of his time that close to the unit. In actual practice, the operator does not stay close to the unit for more than a brief time period and has a duty cycle of only a few percent.

Under accident conditions, the radiation strength would be relatively unchanged.

~~CONFIDENTIAL INFORMATION~~

USERS' Instruction Manual

RADIATION SAFETY

A. Introduction - Compuglass is a state-of-the-art analytical radiation instrument used in qualitative analysis of reinforced composite materials. A radioactive material is used as the radiation source in this device (Compuglass) for nondestructive method of sample analysis. The possession, use, transfer and disposal of this device is regulated by the U.S. Nuclear Regulatory Commission (NRC) and/or by Agreement States.

You must read and understand your responsibility as the user of this device. We have provided you with a copy of the part of the NRC regulations in the next section that explains your responsibilities.

There are a few important points that you must familiarize yourself with as the user of this device. These points are:

1. You must read and understand the section of the NRC regulations that is enclosed.
2. You must always know the whereabouts of this device.
3. You must assure that all labels affixed on the device at the time of arrival are maintained in legible condition.
4. You must provide a safe and secure area for this device.
5. You must assure that the device is tested for the leakage of radioactive material every six months and the required records explained in the leak test section of this manual are kept for the specified period.
6. You must not sell, transfer or lease this device without prior approval of NRC or/and the Agreement States.
7. You must notify the RMD and NRC authorities if this device is missing, damaged in fire, or if the result of the leak test proved to be in excess of the specified limits.

At RMD we try to provide you with all the support and help that you may need for safe operation of this device so, please do not hesitate to call us if you have any questions.

B. Leak Testing Procedure - Section 31.5 CC (2) of 10 CFR requires you, the user, as the general licensee to test the device for leakage of radioactive material at no longer than six month intervals.

You should acquire the services of a commercial distributor of leak-test kits approved by the NRC for this purpose. The leak-test procedure used by the provider of the service must be sensitive enough to be able to positively detect .005 microcurie of radioactive material. The leak-test kits provided by the commercial distributors should contain all the necessary components including the swabs, wipes, absorbent-tipped sticks and returning envelope.

1. Parts and Area of the Leak Test - Leak tests are generally performed on the closest surface to the source. Since your access to the source housing is limited, therefore the closest part to the source that you should perform leak testing on are: a) the sample holder, and b) the sample holder tray.

2. Procedure:

- a. Remove the sample holder and sample holder tray from the device.
- b. Follow the leak-test kit distributor instructions for the test preparations.
- c. Use the wipe test swab on the outside surface of and bottom of the sample holder and the bottom of the sample holder tray according to wipe test

kit instructions.

d. Follow the wipe-test kit's instructions for handling procedures.

3. Leak Test Results: - If the leak-test results performed on the specified parts, positively identified a leaking source, you should:

- o Immediately stop the usage of the device.
- o Notify RMD within twenty-four hours.
- o Assure that the device is maintained in a safe area.
- o Notify NRC or/and the Agreement State authorities within five days.

In such a case an RMD qualified personnel will arrive at your facility to investigate the cause of the leakage and safe removal and packaging of the source housing.

C. Records to Keep - As the general licensee you should maintain records regarding your leak-testing. These records contain information about leak testing and the results provided to you in the form of a leak-test certificate. The supplier of the leak-test kits must provide you with a leak-test certificate and you should maintain this certificate for the period specified in the general license regulations (currently one year).

The information that you should maintain during the leak testing is:

- o Identification of the source and device: manufacturer name, model number, serial number, isotope, quantity.
- o Date of test and date of next scheduled test.
- o Information on the test method used: type of wipes such as, dry or wet.
- o Identification of the individual who performed the test.

The first leak test should be performed immediately after the installation of the device.

D. Regulatory Details - The use of this device (Compuglass) is regulated by Nuclear Regulatory Commission (NRC) and/or by the Agreement States. As the user of the Compuglass, you are a "General Licensee" of the NRC with formal responsibilities for certain transfer and reporting requirements under 10CFR 31.5 (Code of Federal Regulations, Part 31, Section 5).

Below, we are providing you a copy of the General License contained in 10CFR 31.5. Please note that if your state is an agreement state, the use of this device is regulated by your state's requirements which are substantially the same as those in part 31.5 of 10CFR.

Part 31.5 Certain measuring, gauging or controlling devices.

(a) A general license is hereby issued to commercial and industrial firms and research, educational and medical institutions, individuals in the conduct of their business, and Federal, State or local government agencies to acquire, receive, possess, use or transfer, in accordance with the provisions of paragraphs (b), (c) and (d) of this section, byproduct material contained in devices designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition, or for producing light or an ionized atmosphere.

(b) The general license in paragraph (a) of this section

~~CONFIDENTIAL~~

applies only to byproduct material contained in devices which have been manufactured or initially transferred and labeled in accordance with the specifications contained in a specific license issued pursuant to 32.51 of this chapter or in accordance with the specifications contained in a specific license issued by an Agreement State which authorizes distribution of the devices to persons generally licensed by the Agreement State.

(c) Any person who acquires, receives, possesses, uses or transfers byproduct material in a device pursuant to the general license in paragraph (a) of this section:

(1) Shall assure that all labels affixed to the device at the time of receipt and bearing a statement that removal of the label is prohibited are maintained thereon and shall comply with all instructions and precautions provided by such labels;

(2) Shall assure that the device is tested for leakage of radioactive material and proper operation of the on-off mechanism and indicator, if any, at no longer than six-month intervals as are specified in the label, however:

(i) Devices containing only krypton need not be tested for leakage of radioactive material, and

(ii) Devices containing only tritium or not more than 100 microcuries of other beta and/or gamma emitting material or 10 microcuries of alpha emitting material and devices held in storage in the original shipping container prior to initial installation need not be tested for any purpose;

(3) Shall assure that the tests required by paragraph (c)(2) of this section and other testing, installation, servicing, and removal from installation involving the radioactive materials, its shielding or containment, are performed:

(i) In accordance with the instructions provided by the labels; or

(ii) By a person holding a specific license pursuant to Parts 30 and 32 of this chapter or from an Agreement State to perform such activities;

(4) Shall maintain records showing compliance with the requirements of paragraphs (c)(2) and (c)(3) of this section. The records shall show the results of tests. The records also shall show the dates of performance of, and the names of persons performing, testing, installation, servicing, and removal from installation concerning the radioactive material, its shielding or containment. Records of tests for leakage of radioactive material required by paragraph (c)(2) of this section shall be maintained for one year after the next required leak test is performed or until the sealed source is transferred or disposed of. Records of tests of the on-off mechanism and indicator, required by paragraph (c)(2) of this section, shall be maintained for one year after the next required test of the on-off mechanism, and indicator is performed or until the sealed source is transferred or disposed of. Records which are required by paragraph (c)(3) of this section shall be maintained for a period of two years from the

date of the recorded event or until the device is transferred or disposed of;

(5) Upon the occurrence of a failure of or damage to, or any indication of a possible failure of or damage to, the shielding of the radioactive material or the on-off mechanism or indicator, or upon the detection of 0.005 microcurie or more removable radioactive material, shall immediately suspend operation of the device until it has been repaired by the manufacturer or other person holding a specific license pursuant to Parts 30 and 32 of this chapter or from an Agreement State to repair such device, or disposed of by transfer to a person authorized by a specific license to receive the byproduct material contained in the device, and, within 30 days, furnish to the Director of the appropriate Nuclear Regulatory Commission, Inspection and Enforcement Regional Office listed in Appendix D of Part 20 of this chapter, a report containing a brief description of the event and the remedial action taken;

(6) Shall not abandon the device containing byproduct material

(7) Shall not export the device containing byproduct material except in accordance with part 110 of this chapter;

(8) Except as provided in paragraph (c)(9) of this section, shall transfer or dispose of the device containing byproduct material only by transfer to persons holding a specific license pursuant to Parts 30 and 32 of this chapter or from an Agreement State to receive the device and within 30 days after transfer of a device to a specific licensee shall furnish to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 a report containing identification of the device by manufacturer's name and address of the person receiving the device. No report is required if the device is transferred to the specific licensee in order to obtain a replacement device;

(9) Shall transfer the device to another general licensee only:

(i) Where the device remains in use at a particular location. In such case the transferor shall give the transferee a copy of this section and any safety documents identified in the label of the device and within 30 days of the transfer, report to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, the manufacturer's name and model number of device transferred, the name and address of the transferee, and the name and/or position of an individual who may constitute a point of contact between the Commission and the transferee; or

(ii) Where the device is held in storage in the original shipping container at its intended location of use prior to initial use by a general licensee.

(10) Shall comply with the provisions of 20.402 and 20.403 of this chapter for reporting radiation incidents, theft or loss of licensed material, but shall be exempt from the other

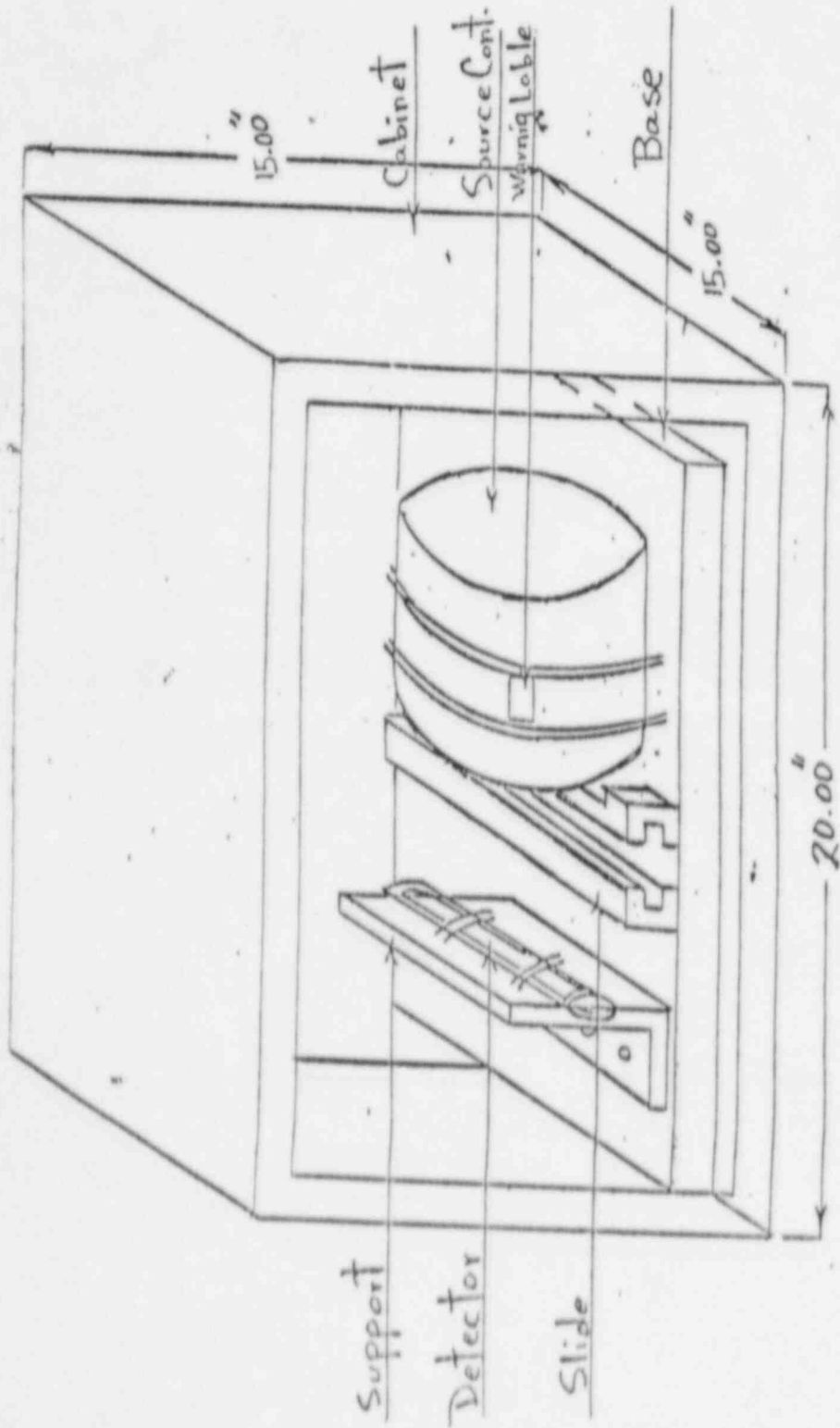
~~PROPRIETARY INFORMATION~~

requirements of Parts 19, 20, and 21, of this chapter.

(d) The general license in paragraph (a) of this section does not authorize the manufacture or import of devices containing byproduct material.

(Secs. 201 and 202, Pub. L. 93-438, 88 Stat. 1242, 1244 (42 U.S.C. 5841, 5842) sec. 161, as amended, pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201).

(39 FR 43532, Dec. 16, 1974, as amended at 40 FR 8785, Mar. 3, 1975; 40 FR 14085, Mar. 28, 1975; 41 FR 18302, May 3, 1976; 42 FR 25721, May 19, 1977; 42 FR 28896, June 6, 1977; 43 FR 6922, Feb. 17, 1978).



Sketch of the Device

APPROVED BY:

SCALE: N/A

DRAWN BY S.A.

DATE: 6.14.84

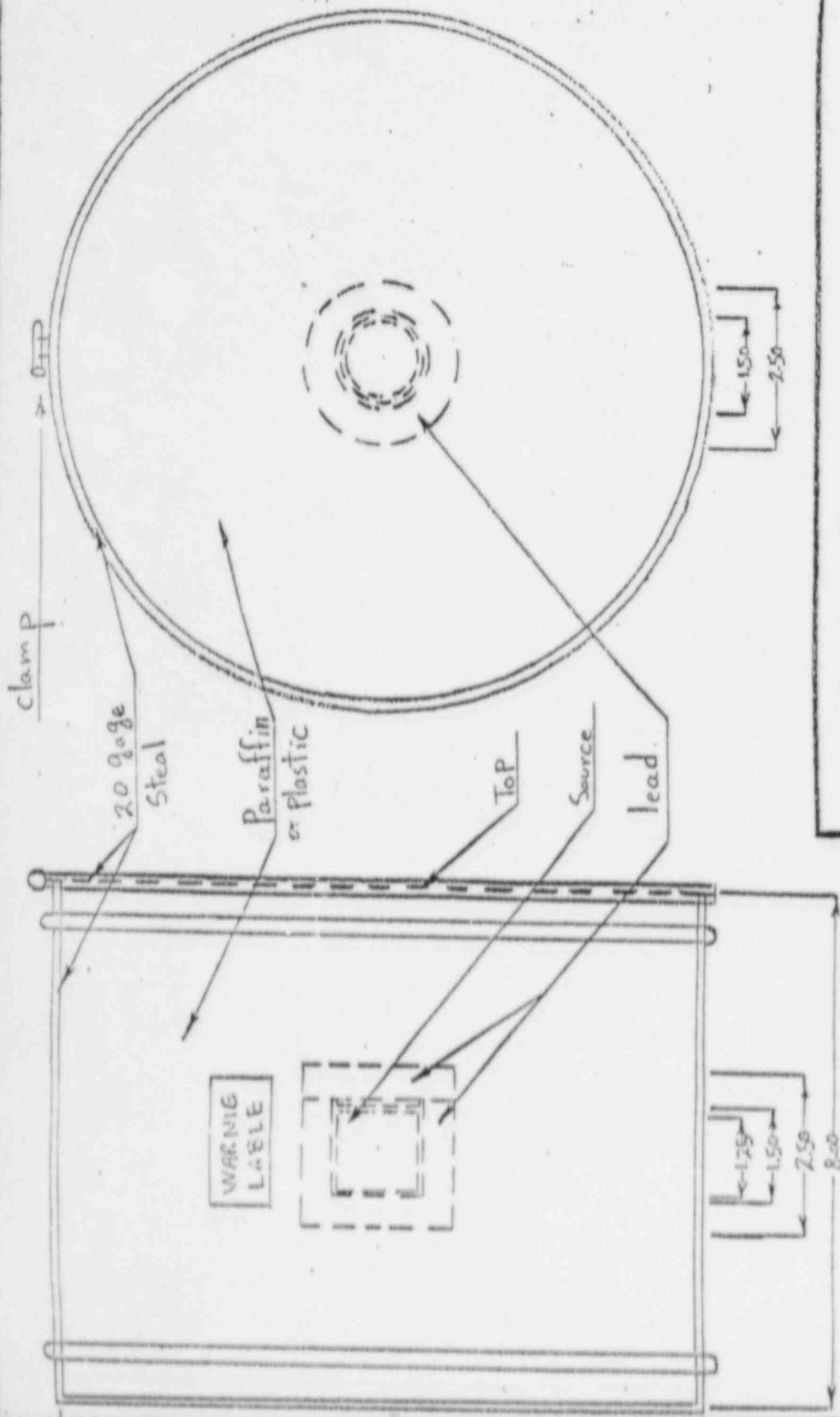
REVISED

Radiation Monitoring Devices

Note: Device Shown with no front pannel

DRAWING NUMBER
A40Z-3004

Fig 1



The Source Container

SCALE 1:2.5	APPROVED BY: <i>B. S.A.</i>	DRAWN BY S.A.
DATE 6-14-84		REVISED
Radiation Monitoring Devices		
Note: All dimensions in inches.		DRAWING NUMBER A402-3005

Fig 2



Fig 3

F. X. MASSE ASSOCIATES, INC.

Health Physics Consultants

MAPLE ST., P. O. BOX 95
MIDDLETON, MASS. 01949

24 HOURS
617-267-3300
(PAGING SERVICE)

MEMORANDUM

TO: Tony Ratkowski, Ph.D., RMD, Watertown, MA
FROM: Frank Masse' *FRM*
SUBJECT: SURVEY OF NEUTRON TRANSMISSION GAUGE
DATE: 5/5/82

Following are the results of my 4/27/82 measurement for stray radiation around the prototype neutron transmission gauge at your Watertown facilities.

Neutron Measurement: Measurements were made with an Eberline PNR-4 portable Rem counter which was calibrated against an NBS-traceable PuBe source on the day of measurements. Preliminary scanning of the system failed to detect any area noticeably higher in leakage rates. Measurement results around the device were as follows:

	<u>30 cm</u>	<u>100 cm</u>
Front	< 0.25 mrem/hr	<< 0.1 mrem/hr
Rear	"	"
Right	"	"
Left	"	"
Top	"	"
Bottom	"	"

9

Gamma measurements were made with a Victoreen Panoramic portable ion chamber calibrated against an NBS-traceable Cs-137 source on the day of measurements. Again, preliminary scanning of the system failed to detect any areas noticeably higher in leakage rates. Following are the gamma results.

Dose rates at 7 mg/cm²

	5 cm	30 cm	100 cm
Front	< 0.1 mr/hr	<< 0.1 mr/hr	<<< 0.1 mr/hr
Rear	"	"	"
Right	"	"	"
Left	"	"	"
Top	"	"	"
Bottom	"	"	"

The above very low readings (minimum detectable for the instrument) also apply to the measurement observed with the 300 mg/cm² absorber in place.