POLIMASTER
Technology

Polimaster Technology
2300 Clarendon Boulevard, Suite 708
Arlington VA, 22201
Tel.: (703) 525-5075
Fax: (703) 525-5079
Toll-free: (866) 560-7654 (POLI)

NM563

Manufacturing:
44873 Falcon Place, Suite 128
Sterling,VA 20166

LICENSING ASSISTANCE TEAM
DIVISION OF NUCLEAR MATERIALS SAFETY
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

LL 31243
030 37459
03221

April 16, 2007

(45-31243-01)

Subject: Polimaster Technology, Inc. Application for Material License.

To Whom It May Concern:

Polimaster Technology Incorporated is hereby submitting our Application for Material License, NRC Form 313, along with NRC Form 526 (Certification of Small Entity Status for the Purposes of Annual Fees Imposed under 10 CFR Part 171 FY 2006.) Polimaster Technology Incorporated wishes to be licensed to possess a limited quantity of Sealed Sources of Byproduct Material for the purpose of calibration of our Radiation Detection Systems manufactured in Sterling, Virginia. The use of Sealed Sources for our calibration phase of manufacturing is absolutely critical to maintaining our quality standards as well as our ability to manufacture equipment domestically.

Attached you will find our license application and supporting documents per NUREG-1556, Vol. 18, "Consolidated Guidance about Materials Licenses: Program-Specific Guidance about Service Provider Licenses," dated November 2000. Additional information, if required, can be attained through our RSO, Matthew Kish. Mr. Kish's contact information is on NRC Form 313 in section four.

In closing, Polimaster Technology Incorporated would like to thank you for your time and consideration. We are eager to work with the NRC however possible to ensure the safety of our personnel, members of the public, and of course the natural environment.

Sincerely,

Vladimir Kanevsky, President

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REGION 1
2007 APR 24 AM 11: 06

140434

NMSS/RGN1 MATERIALS-002

NRC FORM 313 U.S. NUCLEAR REGULATORY COMMISSION
(10-2005)
10 CFR 30, 32, 33,
34, 35, 36, 39, and 40

APPLICATION FOR MATERIAL LICENSE

APPROVED BY OMB: NO. 3150-0120 EXPIRES: 10/31/2008

Estimated burden per response to comply with this mandatory collection request: 4.4 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Records and FOIA/Privacy Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

ALABAMA, CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, FLORIDA, GEORGIA, KENTUCKY, MAINE, MARYLAND, MASSACHUSETTS, MISSISSIPPI, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, PENNSYLVANIA, PUERTO RICO, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

LICENSING ASSISTANCE TEAM
DIVISION OF NUCLEAR MATERIALS SAFETY
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

LL 31243
03037459

NUCLEAR MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TX 76011-4005

03221

(45-31243-01)

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S.NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [x] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER
- [ ] C. RENEWAL OF LICENSE NUMBER

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include ZIP code)*

Polimaster, Inc.
Matthew M Kish, RSO
2300 Clarendon Blvd, STE 708
Arlington, VA 22201

3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Polimaster Technology, Inc
Matthew Kish, RSO
44873 Falcon Place, STE 128
Sterling, VA 20166

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Matthew M. Kish (RSO)

TELEPHONE NUMBER

(240) 644-4409

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number; b. chemical and/or physical form; and c. maiximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSE FEES *(See 10 CFR 170 and Section 170.31)*

FEE CATEGORY Item 3, Part P | AMOUNT ENCLOSED $ 1,700.00

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 39, AND 40, AND THAT ALL INFORMATION CONTANED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER – TYPED/PRINTED NAME AND TITLE	SIGNATURE	DATE
Vladimir Kanevsky, President		04/16/2007

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			$		
APPROVED BY			DATE		
					140434

Application for Material License response attachment

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR MATERIAL LICENSE

NRC FORM 313

(10-2005)
10 CFR 30, 32, 33,
34, 35, 36, 39, and 40

Item No. 5
RADIOACTIVE MATERIAL

5. RADIOACTIVE MATERIAL

In response to item 5, NRC form 313, Radioactive Material to be possessed by Polimaster Technology, Inc, we intend to utilize the following sealed sources for calibration purposes:

Sealed Sources and Devices Registry data sheets for these sources attached as **SS&D Figure 1** and **SS&D Figure 2** respectively.
Capsules 3024 & 3015 are covered under 04060122.
The D disc is covered under 04060106

Source 01:
Isotope Product Labs Catalogue #: CF230240010U
Nuclide: Cf-252 (Californium-252)
Activity: 10.7 micro Curie
A3024-1 Capsule (Sealed)
X 1 piece

Source 02:
Isotope Product Labs Catalogue #: CS730150003M
Nuclide: Cs-137 (Cesium-137)
Activity: 3 milli Curie
A3015 Capsule (Sealed)
X 1 piece

Source 03:
Isotope Product Labs Catalogue #: CS730150001U
Nuclide: Cs-137 (Cesium-137)
Activity: 1 micro Curie
Instructions: A3015 Capsule (Sealed)
X 1 piece

Source 04:
Isotope Product Labs Catalogue #: GF-241-D
Nuclide: Am-241 (Americium-241)
Activity: 2.7 micro Curie
Type D Disk
Container-Substrate: Plastic (Sealed)
X 5 pieces (13.5 micro Curie total)

Application for Material License response attachment

Source 05:
Isotope Product Labs Catalogue #: GF-060-D
Nuclide: Co-60 (Cobalt-60)
Activity: 2.7 micro Curie
Type D Disk
Container-Substrate: Plastic (Sealed)
X 5 pieces (13.5 micro Curie total)

Source 06:
Isotope Product Labs Catalogue #: GF-152-D
Nuclide: Eu-152 (Europium-152)
Activity: 2.7 micro Curie
Type D Disk
Container-Substrate: Plastic (Sealed)
X 5 pieces (13.5 micro Curie total)

5. RADIOACTIVE MATERIAL

Financial Assurance and Record Keeping for Decommissioning

Polimaster Technology, Inc has reviewed 10CFR 30.35 (b) (d) and has determined that we should not have to set aside decommissioning funds. 10CFR 30.35 is based on Appendix B but sends us to 10 CFR 30.35(d) in which the "funding plan" shows no funding required for less than 1E3 times values of appendix B. All of our sources are less than 1000 times B and the sum of their ratios or fractions is less than 1.000.

SS&DR Figure 1

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES

SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA406S122S

13 pages total, including this page.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA406S122S DATE: October 9, 1998

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

MODEL: HEG-XXX Series (Formerly 225)

XXX Represents Radionuclide Mass Number

MANUFACTURER/DISTRIBUTOR: Isotope Products Laboratories
1800 North Keystone Street
Burbank, California 91504
(8 18) 843-7000

ISOTOPE:		MAXIMUM ACTIVITY:	
(a)	Cesium-137	(a)	600 mCi
(b)	Cobalt-60	(b)	600 mCi
(c)	Sodium-22	(c)	100 mCi
(d)	Cobalt-57	(d)	300 mCi
(e)	Cobalt-58	(e)	300 mCi
(f)	Germanium-68	(f)	50 mCi
(g)	Barium-133	(g)	100 mCi
(h)	Radium-226	(h)	50 mCi
(i)	Thorium-228, Thorium-229, Actinium, Protactinium	(i)	50 mCi
(j)	Thorium-230, Thorium-232, Uranium	(j)	30 mCi
(k)	Californium-252	(k)	1 mCi (2 μg)
(l)	Europium-152	(l)	20 mCi
(m)	Americium-241	(m)	50 mCi

LEAK TEST FREQUENCY: Six (6) Months

PRINCIPAL USE: Gamma Gauge (D)

CUSTOM SOURCE: _____ YES __X__ NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

DESCRIPTION:

This series of sources is doubly encapsulated and constructed of Type 304 or Type 304L stainless steel with a minimum wall thickness of 0.040" (combined inner and outer capsule thickness). The A3026 is triply encapsulated. Four sizes are available: (1) 0.625" long by 0.25" diameter, (2) 0.315" to 0.395" long by 0.236" diameter, (3) 0.473" to 0.500" long by 0.236" diameter, and (4) 1.43" long by 0.370" diameter.

The chemical forms of the active elements in the HEG series are Chlorides or Nitrates in Ceramic, Oxides in Gold or Aluminum, or metal plated onto substrate.

These sources are designated as "Special Form" and have been issued Special Form Certificate Number USA/0356/S.

LABELING:

The source is engraved with IPL, the nuclide, nominal activity, and serial number.

DIAGRAM:

Drawing Nos. A3000, A3015, A3023, A3024 & A3026 (see Attachments 1 through 5).

CONDITIONS OF NORMAL USE:

These sources are normally used by trained personnel in a laboratory environment, installed in gauging devices, or installed in well logging tools (See "Prototype Testing" and "Limitations and/or Other Considerations of Use").

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

PROTOTYPE TESTING:

Prototype sources have undergone testing per ANSI N542-1977 indicating the following classifications:

Capsule Drawing No.	ANSI N.542-1977 Classification	ANSI N.542-1977 Recommended Usage
A3000	77C66535	Gamma Gauging & Oil well logging*
A3015	77C66535	Gamma Gauging & Oil well logging*
A3023	77C63333	Gamma Gauging
A3024	77C66535	Gamma Gauging & Oil well logging*
A3026	77C66535	Gamma Gauging & Oil well logging* (Note: contains an A3000 capsule)

* These sources may be used in down-hole applications, and are pressure tested to 25,000 PSIG minimum. This requirement does not apply to sources used in gamma gauging applications.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA406S122S DATE: October 9, 1998 PAGE: 4 of 7

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

EXTERNAL RADIATION LEVELS:

The radiation level of the source will vary with the contained radionuclide and the activity level. Listed below are radiation levels in mr/hr for the model HEG-XXX sources. Data has been taken, where available, from table of gamma factors on page 131 of the "Radiologic Health Handbook." The factor for 100 cm is taken from the table and the 30 cm and 5 cm radiation levels calculated using the inverse square law. For nuclides not listed in the referenced table, measurements were taken at a measured distance with an ion chamber type survey meter and the radiation levels in the following table calculated using the inverse square law.

		Distance from source		
Nuclide	Activity	5 cm	30 cm	100 cm
(a) Cs-137	600 mCi	79200 mR/h	2200 mR/h	198 mR/h
(b) Co-60	600 mCi	316800	8800	198
(c) Na-22	100 mCi	48,000	1333	120
(d) Co-57	300 mCi	8,400	231	21
(e) Co-58	300 mCi	66,000	1833	165
(f) Ge-68	50 mCi	10,000	280	25
(g) Ba-133	100 mCi	7,700	215	20
(h) Ra-226	50 mCi	16,400	456	41
(i) Th-229, Th-228, Ac, Pa	50 mCi	28,000	778	70
(j) Th-230. Th-232, U	50 mCi	400	11	1
(k) Cf-252	1 mCi	73.1 744*	2.03 20.7*	0.183 Gamma 1.86* Neutron
(l) Eu-152	20 mCi	4640	129	11.6
(m) Am-241	**50 mCi**	**6276**	**174**	**16 mSv/hr ****

*mRem/hr

**** Health Physics and Radiological Health Handbook, revised ed., 1992.**

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

QUALITY ASSURANCE AND CONTROL:

Program: The IPL Quality Assurance Manual details the quality control of these sources from raw materials to finished product. The program is designed to satisfy 10 CFR Part 50 (B) and meets the requirements of ISO 9001. The program covers drawing control, purchasing, training, calibration records, source numbering, incoming raw materials, assay quality control, leak testing, document control, confirming orders, and pre-production design review.

Activity: Held to ± 15% of nominal activity.

Assay procedures: A calibrated ionization chamber is used to measure the activity of the source. For actinides, the content is measured by liquid scintillation counting of an aliquot of starting material.

Radiopurity determination: Determined by gamma or alpha spectrometry of the source or the radionuclide batch.

Leak test procedures: Sources are either leak tested according to the "Immersion With Boiling Test" taken from ANSI N542 1977 Appendix A, Section A2.1.3, or the immersion test from Appendix to ANSI N44.2-1973 "American National Standard for Leak Testing Radioactive Brachytherapy Sources." Criteria for acceptance are.

1.0 nCi removable beta/gamma
0.1 nCi removable alpha

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA406S122S DATE: October 9, 1998 PAGE: 6 of 7

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

a. Distribution: These sources shall be distributed to specific licensees of the NRC or Agreement States.

b. Use: These sources are used in a laboratory environment for checking or calibrating nuclear instrumentation, or to be permanently installed in gauging devices. Sources manufactured to Drawing Numbers A3000, A3015, A3024, and A3026 meet the ANSI N542-1977 guidelines for oil well logging sources and are pressure tested to 25,000 PSIG at the time of manufacture prior to use in down-hole applications.

c. Handling: Remote handling tools and localized shielding should be used.

d. Storage: store in a clean, dry area. Shielding should be provided as necessary.

e. Cleaning: Sources may be cleaned with alcohol or water with a mild detergent.

f. Leak Test: Sources containing radioactive material in excess of the exempt quantities listed in 17 CCR 30235 Schedule A, shall be leak tested at intervals not greater than six months. Such tests must be capable of detecting 0.005 μCi of removable radioactivity, and be performed by specific licensees of the NRC or Agreements States.

g. Disposal: Disposal of decayed or otherwise unusable sources must be made via the user's authorized radioactivity disposal method.

h. This registration sheet and the information contained within the references shall not be changed without the written consent of the California Department of Health Services.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information provided we conclude that the calibration and gauging gamma sources model HEG-XXX series are acceptable for licensing purposes.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA406S122S DATE: October 9. 1998 PAGE: 7 of 7

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

REFERENCES:

a) Isotope Products Laboratories letters with attachments dated March 26, 1985, October 30, 1985, December 15, 1989, January 30, 1990 and October 10, 1993.

b) IPL Quality Assurance Manual.

c) Isotope Products Laboratories letter dated November 30, 1993.

d) Isotope Products Laboratories letter dated April 25, 1995.

e) Isotope Products Laboratories letter dated June 12, 1995, with enclosures thereto.

f) Isotope Products Laboratories letters dated June 30, 1998 and July 1, 1998, with attachment.

ISSUING AGENCY: California Department of Health Services

DATE: October 9, 1998 AMENDED BY: _____
Ronald Rogus, Ph.D.

DATE: October 9, 1998 CONCURRED BY: _____
David Wesley, M.S.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA406S122S DATE: October 9, 1998 ATTACHMENT 1

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

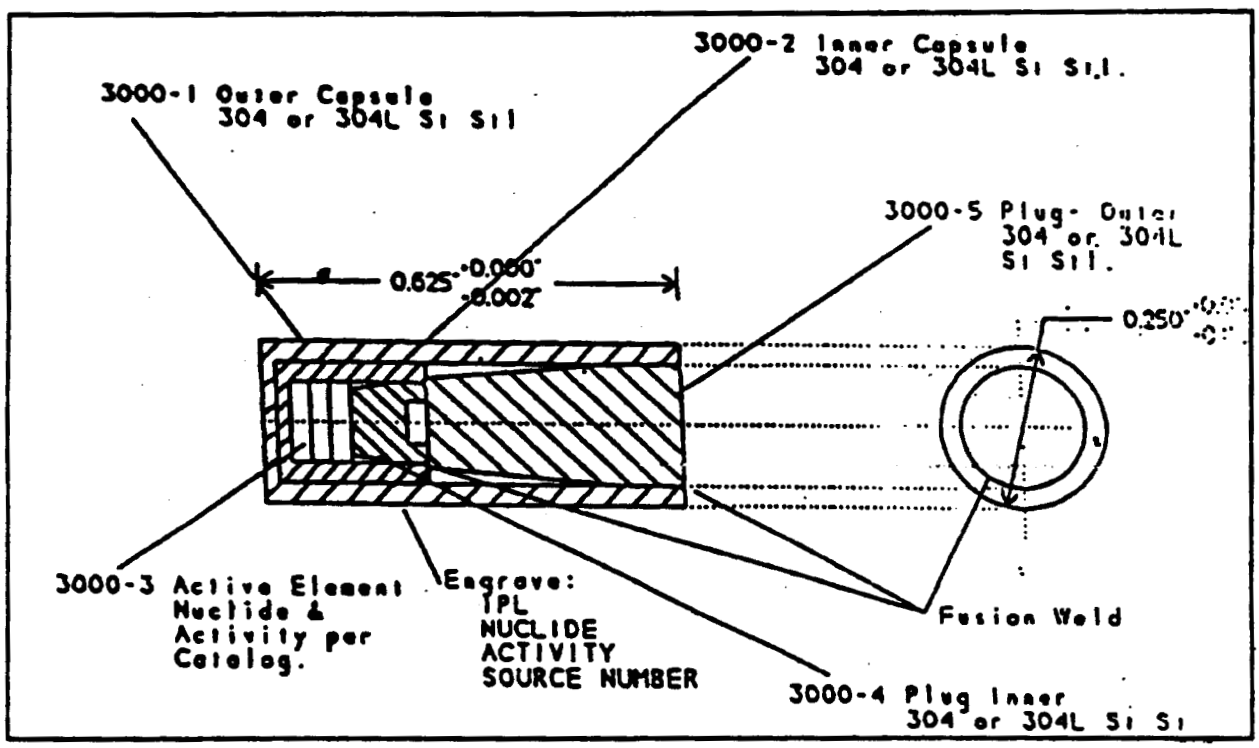


Figure 1: Drawing Number A3000

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA406S122S DATE: October 9, 1998 ATTACHMENT 2

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

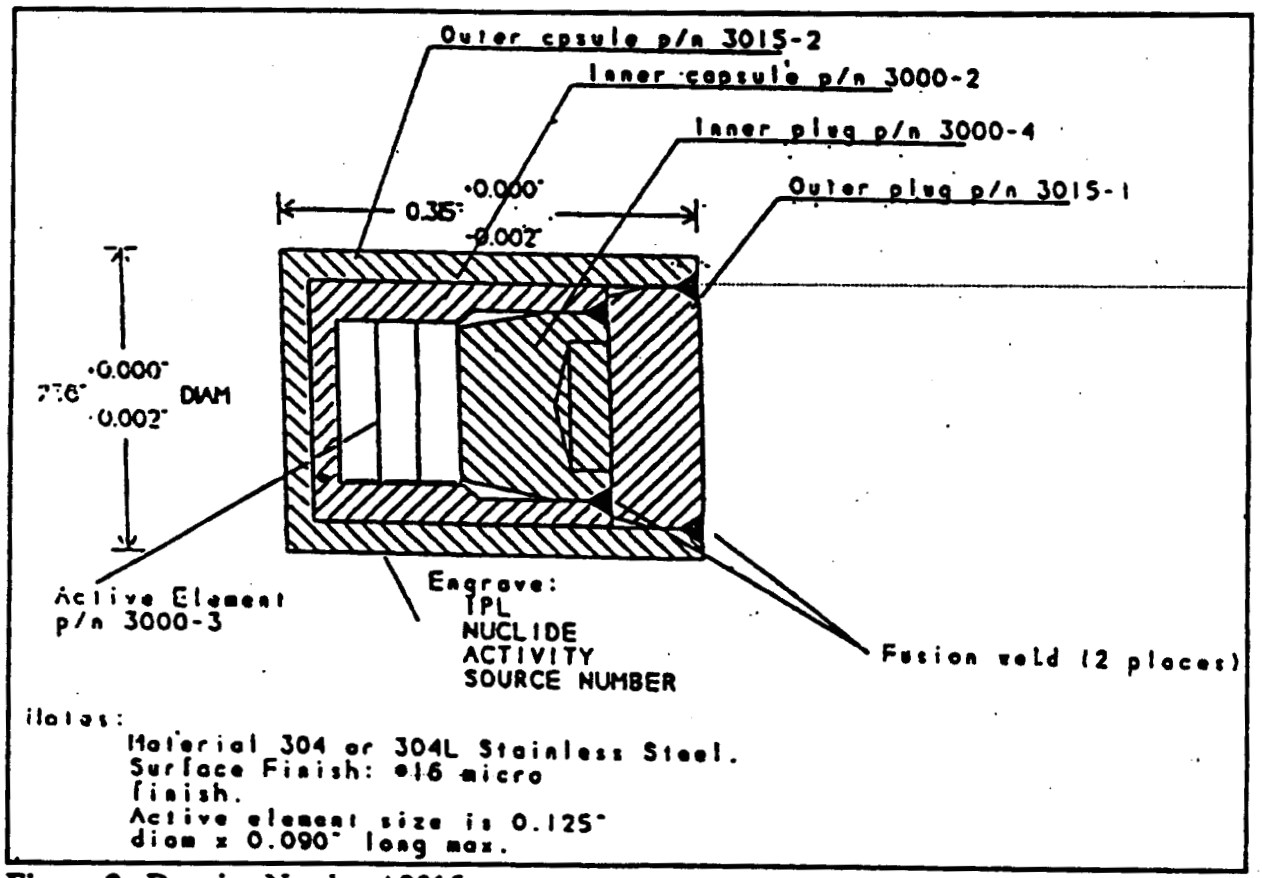


Figure 2: Drawing Number A3015

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA406S122S DATE: October 9, 1998 ATTACHMENT 3

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

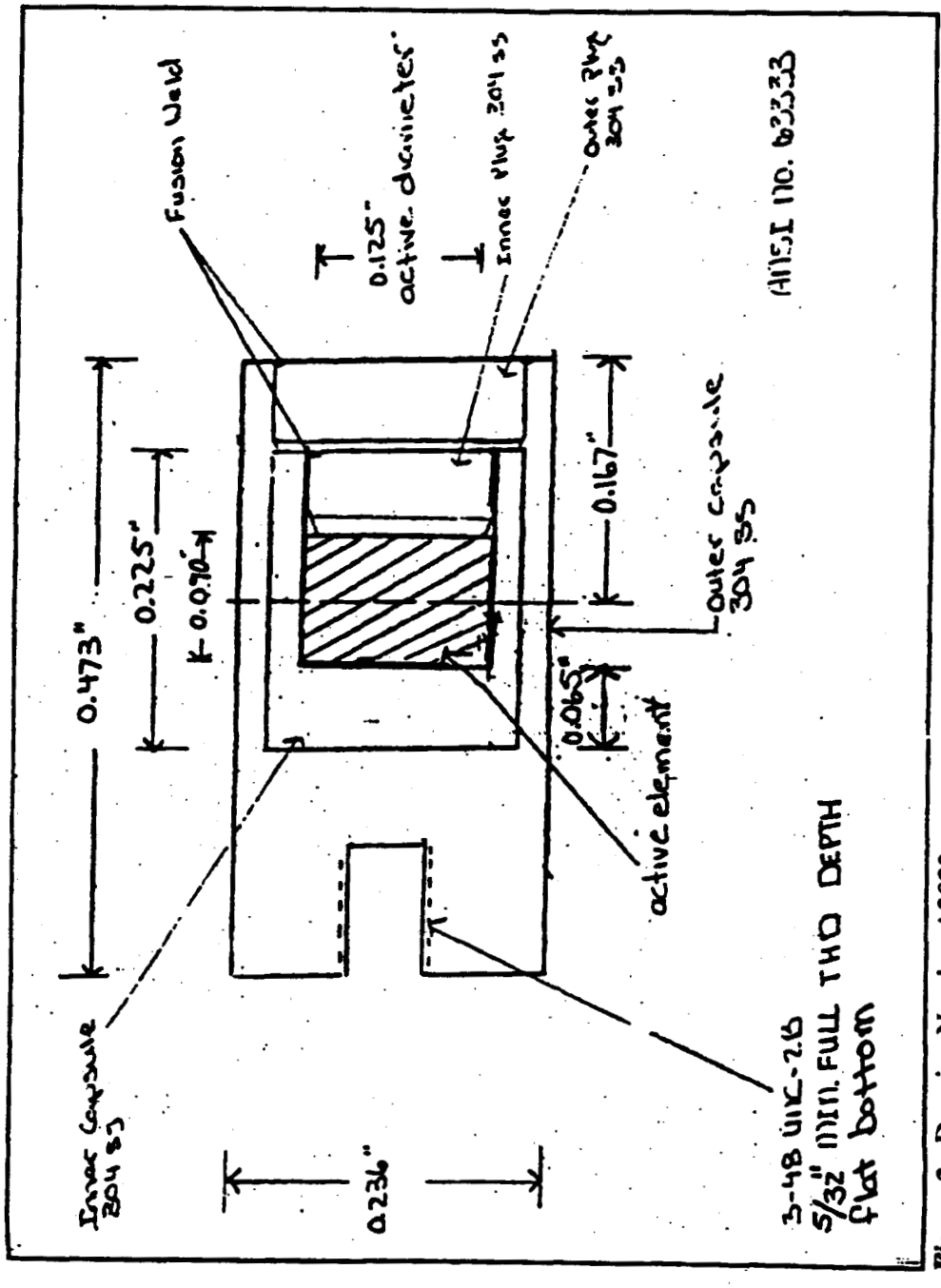


Figure 3: Drawing Number A3023

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA406S122S DATE: October 9, 1998 ATTACHMENT 4

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

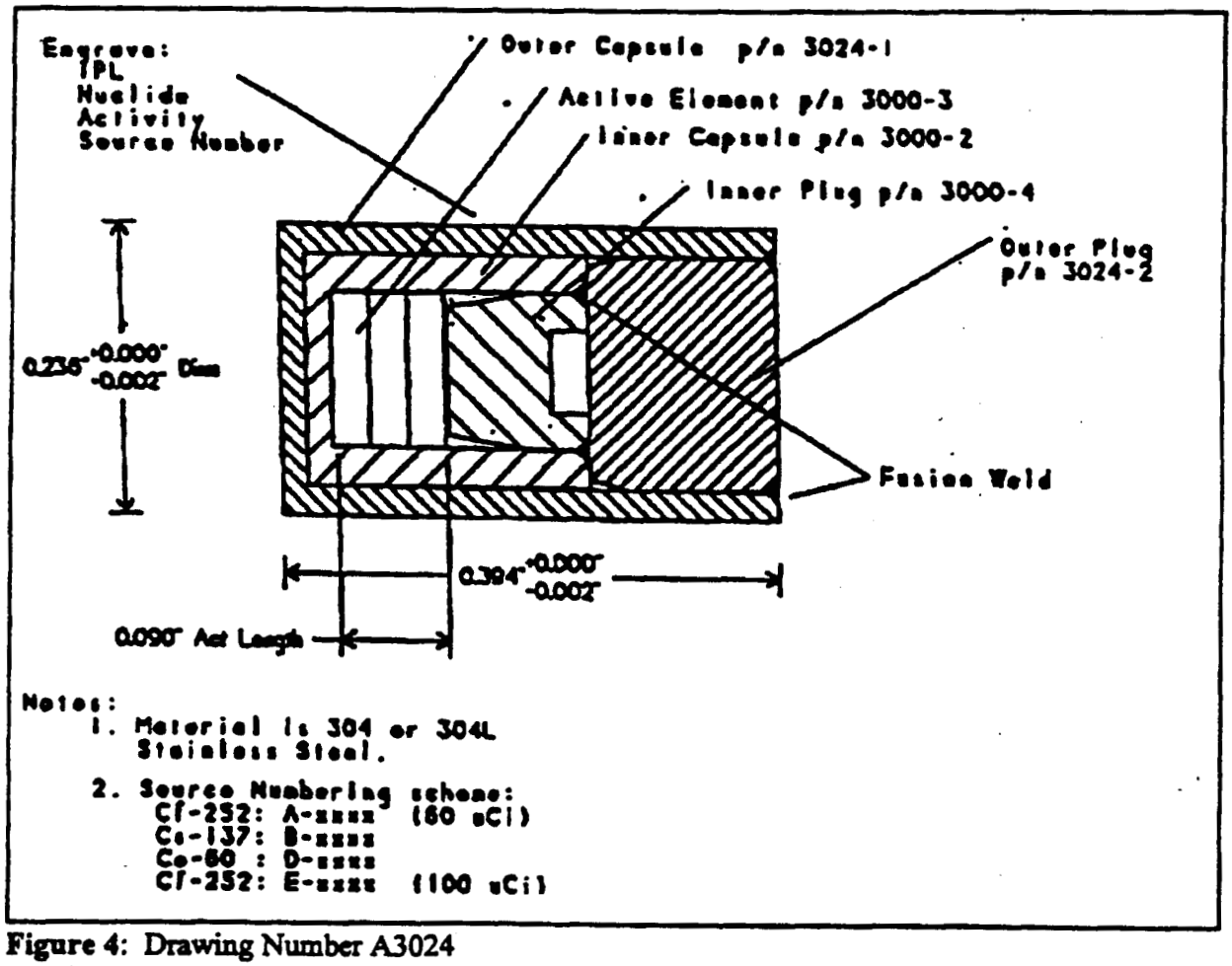


Figure 4: Drawing Number A3024

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA406S122S DATE: October 9, 1998 ATTACHMENT 5

SEALED SOURCE TYPE: Calibration and Gauging Gamma Source

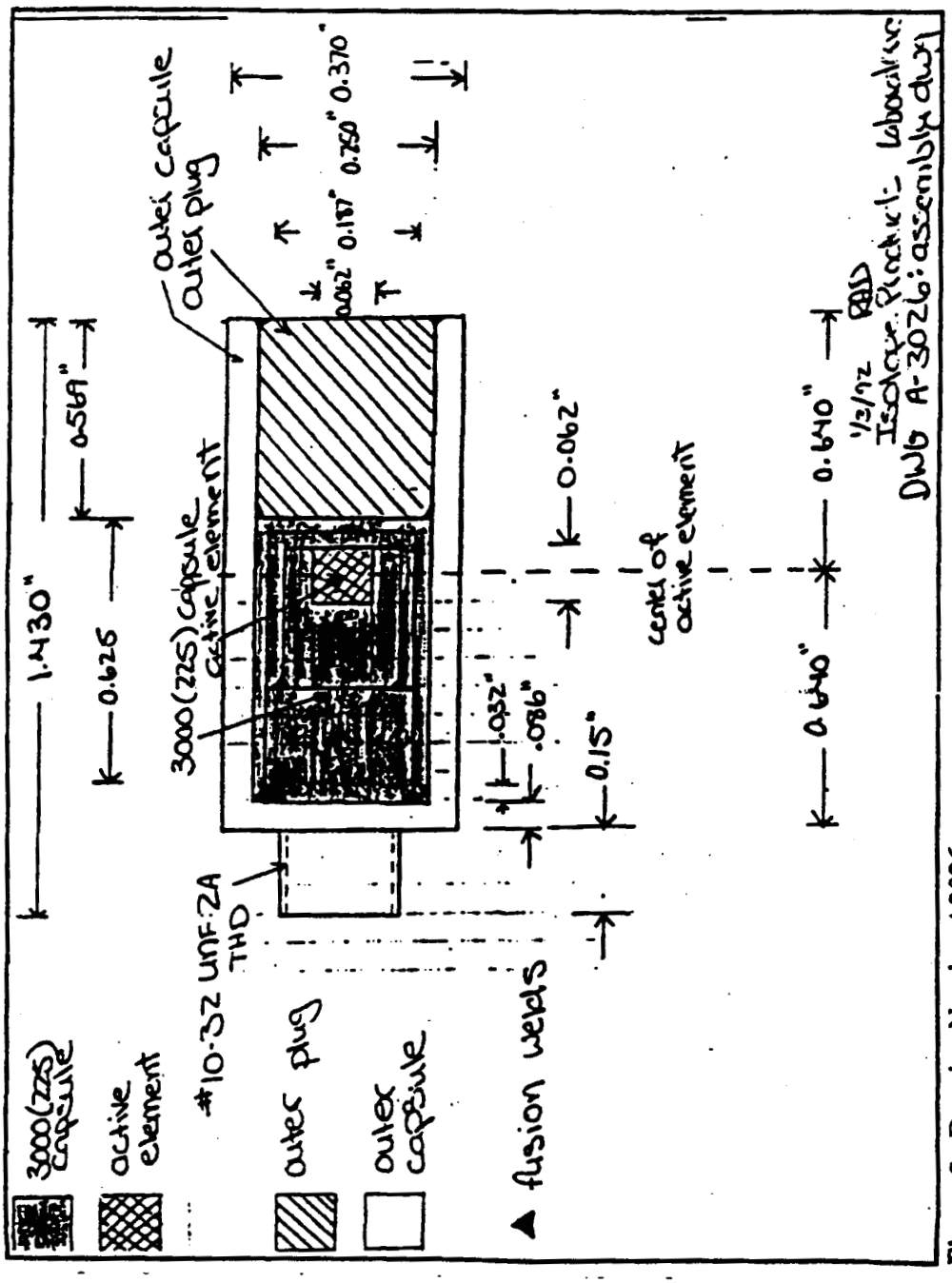


Figure 5: Drawing Number A3026

SS&DR Figure 2

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES

SAFETY EVALUATION OF SEALED SOURCE
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S

18 pages total, including this page.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: **August 25, 2006**

SEALED SOURCE TYPE: Gamma Calibration Source

MODEL:	**GF Type D or M Series (formerly GF-XXX Type D or GF-XXXD or GF-XXXM Series)** **POSK Series** **POSN Series** **SM Series** **ISM Series** **3888** **3916**
MANUFACTURER / DISTRIBUTOR:	Isotope Products Laboratories **24937 Avenue Tibbitts** **Valencia, CA 91355** **(661) 309-1010 (voice)** **(661) 257-8303 (FAX)**

ISOTOPE:	MAXIMUM ACTIVITY:
Americium-241	**500 microcuries (18.5 MBq)**
Radium-226	**500 microcuries (18.5 MBq)**
Thorium-228	**500 microcuries (18.5 MBq)**
Uranium-235	**5 microcuries (185 kBq)**
Uranium (Natural)	**5 microcuries (185 kBq)**
Any Gamma Emitter with atomic number from 3 to 83	**2 millicuries (74 MBq)**

LEAK TEST FREQUENCY:	Six (6) months
PRINCIPAL USE:	(I) Calibration Sources, **and** **(X) Medical Reference Sources**
CUSTOM SOURCE:	☐ Yes ☒ No

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: August 25, 2006 Page: 2 of 9

SEALED SOURCE TYPE: Gamma Calibration Source

DESCRIPTION:

The source consists of deposited metal salt onto a disc or foil made of plastic, aluminized mylar, polyimide (plastic), titanium, platinum, or a 300 series stainless steel disc with maximum dimensions of 0.50 inch thickness and 1.5 inch overall diameter. The active diameter is a minimum of 0.04 inches. The source is sealed with an epoxy fill, self-adhesive polyimide, or by sandwiching a metal foil between two self-adhesive polyimide discs. Alternatively, two metal foils or a disc and plug of the same metal may be sealed by fusion welding.

Sources made with aluminized mylar and polyimide discs may be encased in an aluminum support ring to maintain source integrity.

The gamma emitters with atomic numbers from 3 to 83 shall not exceed the exposure rate of Co-60 as noted in the "External Radiation Levels" section. The source activity range shall be +20% and –15% for all models.

Table 1 lists the source model identification scheme used for sources within this series.

Table 1. Source Model Identification Scheme

Model Number	Maximum Thickness	Overall Maximum Diameter
(b)GF-XXX Type D or Type M	0.50"	1.5"
(b)GF-aaaa	0.50"	1.5"
(b)SM-XXX-YYZ	0.50"	1.5"
ISM-XXX-YYZ	0.50"	1.5"
POSK-XXX or POSN-XXX	0.05"	0.50"
3888	0.05"	0.50"
3916	0.05"	1.5"
aaaa	0.50"	1.5"
aaaa = Numeric designation; (b) = Private label or dedicated model (optional); XXX = Atomic Number; YY = Amount of activity; Z = Units of activity		

Note: Spot marker sources sold under Model No. SM-057 are consolidated within this registry and supersede SS&DR No. CA0406S169S. Gamma calibration sources sold under Model No. GF-XXX Type M Series are consolidated within this registry and supersede SS&DR No. CA0406S111S.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: **August 25, 2006**

SEALED SOURCE TYPE: Gamma Calibration Source

LABELING:

The sources are either engraved or labeled with the information listed on Table 2. Due to the dimensional limitations, inherent to the source, "IPL" and the standard radiation caution symbol may not be included on the source.

Table 2. Labeling

Labeling information	Engraved on the source	Source Label or Source Container	Storage / Shipping Container Label (Optional)
IPL	X		
Isotope Products Laboratories		X	X
Nuclide	X	X	X
Nominal Activity	X	X	X
Serial Number	X	X	X
Reference Date	X	X	X
RADIOACTIVE MATERIAL		X	X
Radiation Symbol			X

In addition, when this source is manufactured for medical reference use, a label is affixed to the storage or shipping container that states, "CDHS has approved distribution of this source to persons licensed to use radioactive material identified in California Code of Regulations, title 17, §30170- §30237 & in 10 CFR 35.65, 35.400, 35.500, & 35.600 as appropriate, & to persons who hold an equivalent license issued by the US NRC or an Agreement State. See IFU for additional instructions, as applicable."

DIAGRAM:

Attachment 1: 1001 Type D Disk Source
Attachment 2: 1202 Type M Gamma Disk (in optional support ring)
Attachment 3: 1905 Spot Marker
Attachment 4: 1937 Model ISM Spot Marker
Attachment 5: 2305 Positron Source, POSN
Attachment 6: 2306 Model POSK Positron Source,
Attachment 7: 3888 Gamma Calibration Disk Source
Attachment 8: 3916 Gamma Calibration Disk Source

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: August 25, 2006

SEALED SOURCE TYPE: Gamma Calibration Source

CONDITIONS FOR NORMAL USE:

The source is designed and manufactured for use as a calibration source. Calibration applications may include energy compensation and/or medical reference. For energy compensation applications, the source is intended to be used within a logging tool or other tool components, as a reference source. The source is also designed and manufactured for checking the performance of detectors, gamma cameras, and other instruments used in a hospital, laboratory, or clinical environment by trained personnel only. The spot markers are used to trace radiological images in a laboratory or clinical environment by trained personnel only.

The calibration sources should not be subjected to conditions of normal use which require a higher rating than ISO 2919: 1999, classification of ISO/99/C22212. Other applications of a research and development nature are acceptable provided that the calibration sources are not subjected to environmental conditions exceeding those listed above. Typical useful life of the calibration source is dependent on nuclide:

Nuclide	Typical Useful Life (years)
Americium-241	15
Barium-133	5
Cadmium-109	2
Cesium-137	10
Cobalt-57	2
Cobalt-60	10
Gadolinium-153	2
Germanium-68	2
Radium-226	10
Sodium-22	5
Thorium-228	10
Uranium-235	10
Uranium (Natural)	10
Yttrium-88	5

PROTOTYPE TESTING:

The prototype sources for Models GF Type D and Type M Series, SM and ISM Series, POSK and POSN Series, and 3888 source design passed the performance tests for a classification of ISO/99/C22212 per ISO 2919: 1999. The prototype sources for Model 3916 source design passed the performance tests for a classification of ISO/99/C33212 per ISO 2919: 1999. All models meet or exceed the required ratings of ISO/99/C22212 for "Calibration source activity > 1 MBq" as defined in ISO 2919: 1999.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: August 25, 2006 Page: 5 of 9

SEALED SOURCE TYPE: Gamma Calibration Source

EXTERNAL RADIATION LEVELS:

The external radiation levels from the calibration sources were calculated using 'Microshield Version 5.05'. Source calculations representing the different materials in the thinnest source (0.010"H) with the activity uniformly distributed were chosen to approximate exposure rates for Models GF Type D and Type M Series, SM and ISM Series, POSK and POSN Series, 3888, and 3916 at the 3 standard distances of 5 cm, 30 cm, and 100 cm. The exposure rates in mR/hr are calculated with the respective maximum activities plus tolerance, as listed below.

Americium-241 Calibration Sources – Maximum Activity plus tolerance = 600 microcuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	3.641	3.661
30 cm	0.1043	0.1051
100 cm	.009610	0.009746

Barium-133 Calibration Sources – Maximum Activity plus tolerance = 2.4 millicuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	274.2	275.0
30 cm	7.818	7.856
100 cm	0.7112	0.7188

Cadmium-109 Calibration Sources – Maximum Activity plus tolerance = 2.4 millicuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	96.42	97.39
30 cm	2.744	2.809
100 cm	0.2482	0.2639

Cesium-137 Calibration Sources – Maximum Activity plus tolerance = 2.4 millicuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	304.7	304.7
30 cm	8.666	8.665
100 cm	0.7824	0.7823

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

SEALED SOURCE TYPE: Gamma Calibration Source

Cobalt-57 Calibration Sources – Maximum Activity plus tolerance = 2.4 millicuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	52.21	52.30
30 cm	1.490	1.492
100 cm	0.1358	0.1360

Cobalt-60 Calibration Sources – Maximum Activity plus tolerance = 2.4 millicuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	1,211	1,210
30 cm	34.42	34.40
100 cm	3.104	3.102

Gadolinium-153 Calibration Sources – Maximum Activity plus tolerance = 2.4 millicuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	80.39	80.84
30 cm	2.302	2.320
100 cm	0.2119	0.2148

Germanium-68 Calibration Sources – Maximum Activity plus tolerance 2.4 millicuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	510.2	510.1
30 cm	14.51	14.50
100 cm	1.310	1.309

Radium-226 Calibration Sources – Maximum Activity plus tolerance = 600 microcuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	0.7891	0.7902
30 cm	0.02248	0.02252
100 cm	0.002041	0.002046

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

SEALED SOURCE TYPE: Gamma Calibration Source

Sodium-22 Calibration Sources – Maximum Activity plus tolerance = 2.4 millicuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	1,109	1,109
30 cm	31.53	31.52
100 cm	2.845	2.843

Thorium-228 Calibration Sources – Maximum Activity plus tolerance = 600 microcuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	0.2147	0.2152
30 cm	0.006129	0.006145
100 cm	0.0005594	0.0005612

Uranium-235 Calibration Sources – Maximum Activity plus tolerance = 6 microcuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	0.1761	0.1764
30 cm	0.005019	0.005027
100 cm	0.0004557	0.0004566

Uranium (Natural) Calibration Sources – Maximum Activity plus tolerance = 6 microcuries

Distance from Source (mR/hr)	Plastic Window Calibration Source	Titanium Window Calibration Source
5 cm	0.00007928	0.00007965
30 cm	0.000002271	0.000002283
100 cm	0.0000002093	0.0000002108

QUALITY ASSURANCE AND CONTROL:

Program: The IPL Quality Assurance Manual details the quality control of these sources from raw materials to finished product. The program is designed to satisfy 10 CFR Part 50 (B) and is ISO 9001 and ISO 13485 certified. The program covers design and document control, purchasing, training, calibration records, source numbering, production, incoming raw materials, assay quality control, leak testing, and confirming orders.

Activity: Activity levels are held to within +20%/-15% of nominally desired activity.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

SEALED SOURCE TYPE: Gamma Calibration Source

Isotope Products Laboratories maintains a quality assurance and control program, which has been deemed acceptable for licensing purposes by the California Department of Health Services. A copy of the program is on file with the California Department of Health Services.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- These sources shall be distributed to persons specifically licensed by the U.S. Nuclear Regulatory Commission, an Agreement State, or Licensing State.
- Handling, storage, use, transfer, and disposal: To be determined by the licensing authority.
- Sources which contain greater than 100 µCi of beta/gamma emitting material shall be leak tested at intervals not to exceed 6 months using techniques capable of detecting 0.005 microcuries (185 Bq) of removable contamination. Source loadings of less than 100 µCi are exempt from leak testing by the Issuing Agency. Leak testing shall be in accordance with the individual requirements of the radiation control agency which exercises regulatory authority.
- **Models GF Type D and Type M Series, SM and ISM Series, POSK and POSN Series, and 3888 shall not be subjected to conditions exceeding their ISO 2919: 1999 classification of ISO/99/C22212. Model 3916 shall not be subjected to conditions exceeding its' ISO 2919: 1999 classification of ISO/99/C33212.**
- The registration sheet and the information contained within the references shall not be changed without the written consent of the California Department of Health Services.

SAFETY ANALYSIS SUMMARY

Based on a review of **Models GF Type D and Type M Series, SM and ISM Series, POSK and POSN Series, 3888, and 3916** sealed sources, its ISO classification, and the information and test data cited below, we continue to conclude that the source is acceptable for licensing purposes.

Furthermore, we continue to conclude that the source would be expected to maintain its containment integrity for normal conditions of use and accidental conditions, which might occur during uses specified in this certificate.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: **August 25, 2006**

SEALED SOURCE TYPE: Gamma Calibration Source

REFERENCES:

The following supporting documents of Models GF Type D and Type M Series, SM and ISM Series, POSK and POSN Series, 3888, and 3916 are hereby incorporated by reference and made part of this registry document:

1. **IPL Quality Assurance Manual (current copy on file with the issuing agency).**
2. Isotope Products Laboratories' letter draft registration and supporting documents dated October 14, 1991 and October 28, 1991.
3. Isotope Products Laboratories' letters dated April 16, 1998 and May 14, 1998 with attachments thereto.
4. **Isotope Products Laboratories' letters dated May 25, 2006, June 23, 2006, and July 25, 2006, with attachments thereto.**

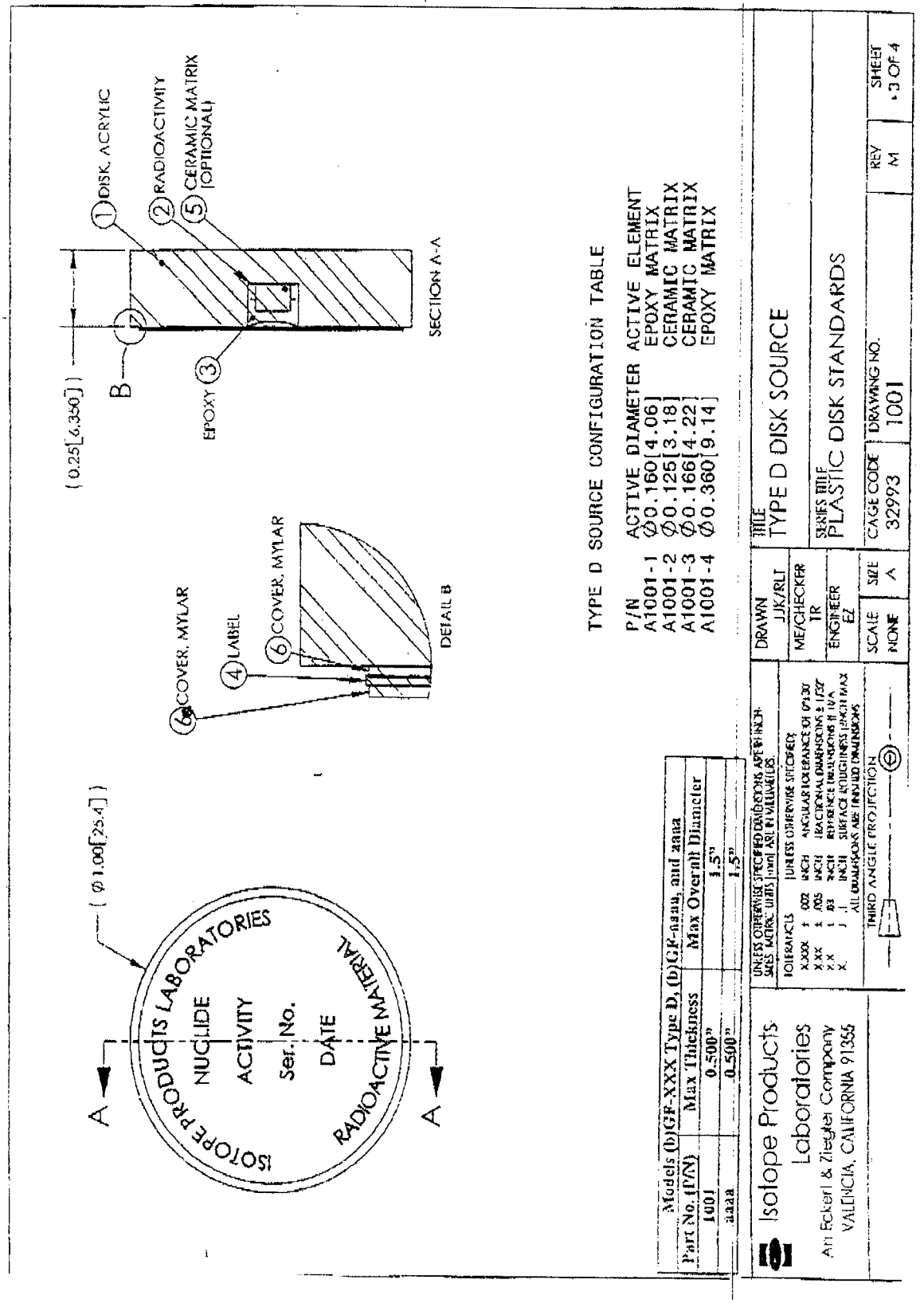
ISSUING AGENCY: California Department of Health Services

DATE: 8/25/06 REVIEWED BY: Zubaida Gulshan
Zubaida Gulshan

DATE: 8/25/06 CONCURRED BY: John D. Fassell
John Fassell

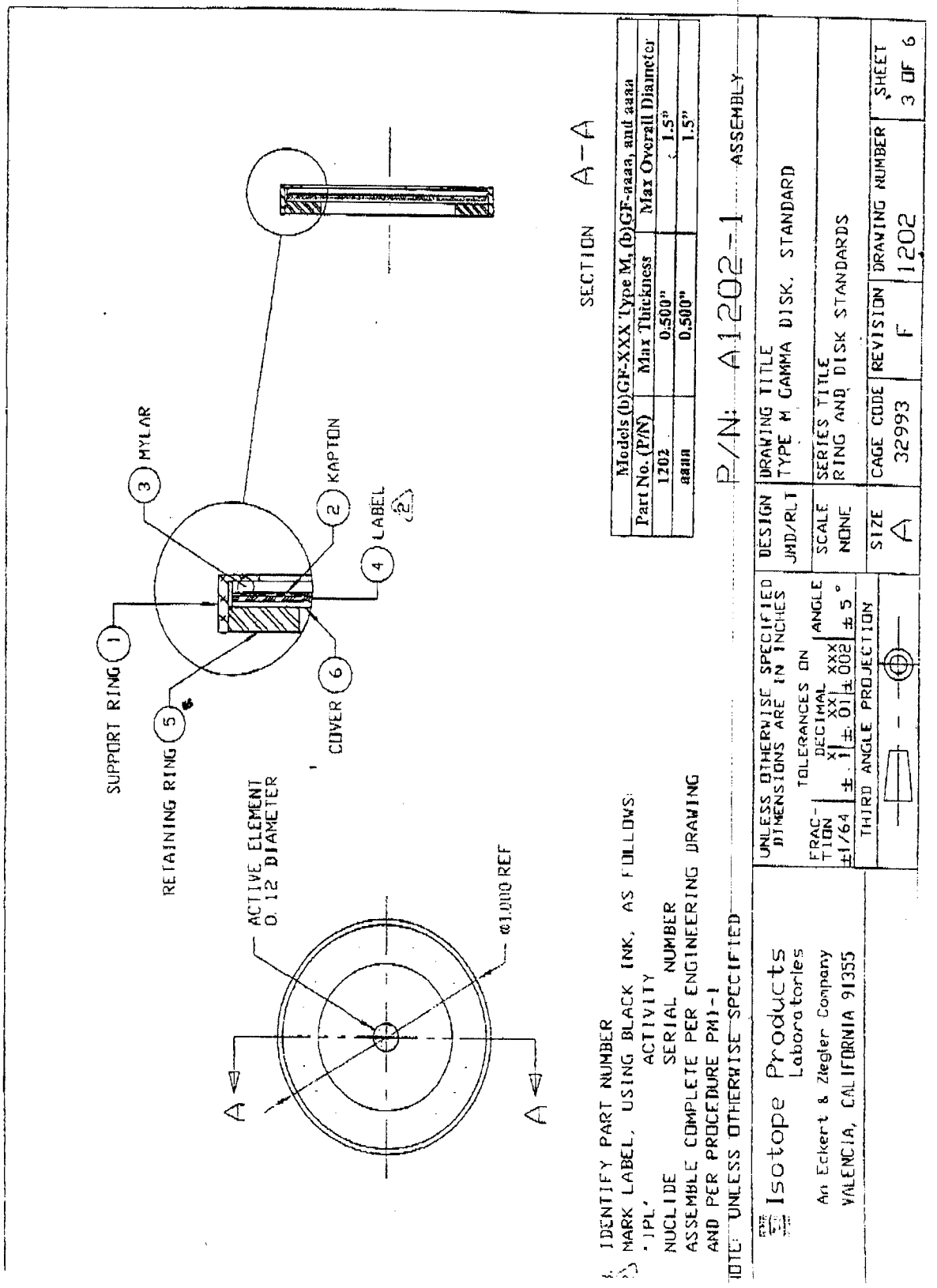
REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: August 25, 2006 Attachment 1
SEALED SOURCE TYPE: Gamma Calibration Source



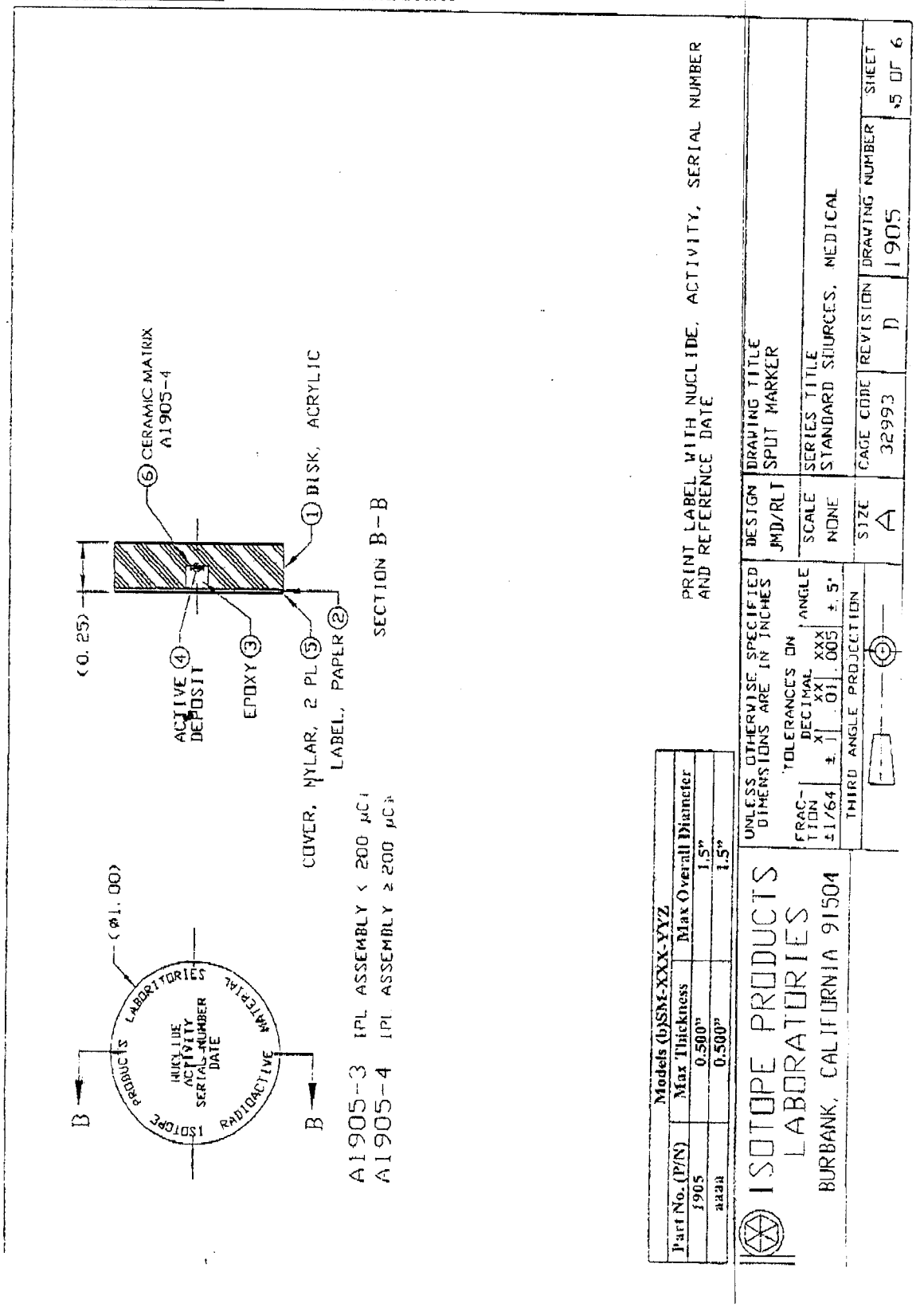
REGISTRY Or RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: **August 25, 2006** Attachment 2
SEALED SOURCE TYPE: Gamma Calibration Source



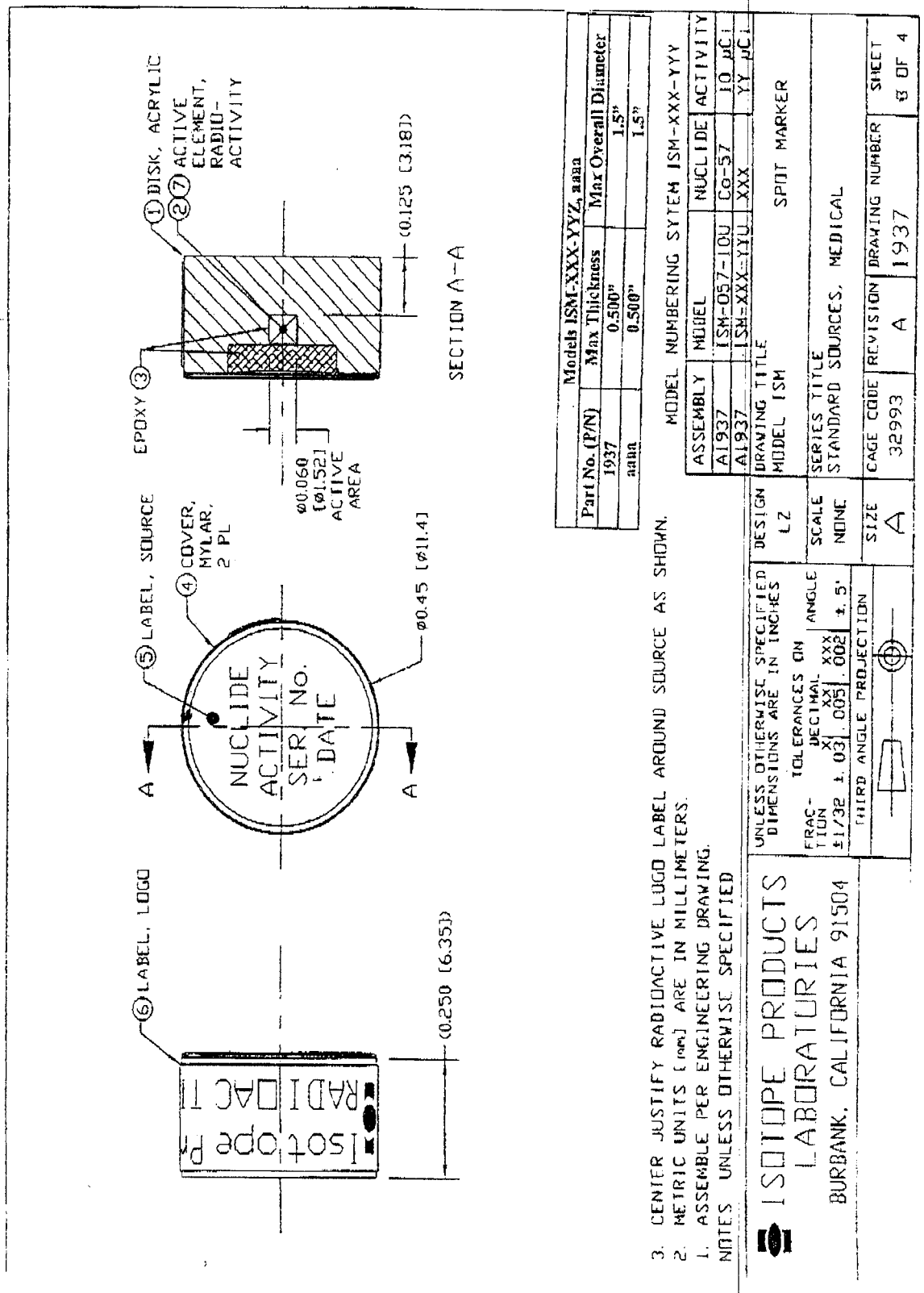
REGISTRY Or RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: **August 25, 2006** Attachment 3
SEALED SOURCE TYPE: Gamma Calibration Source



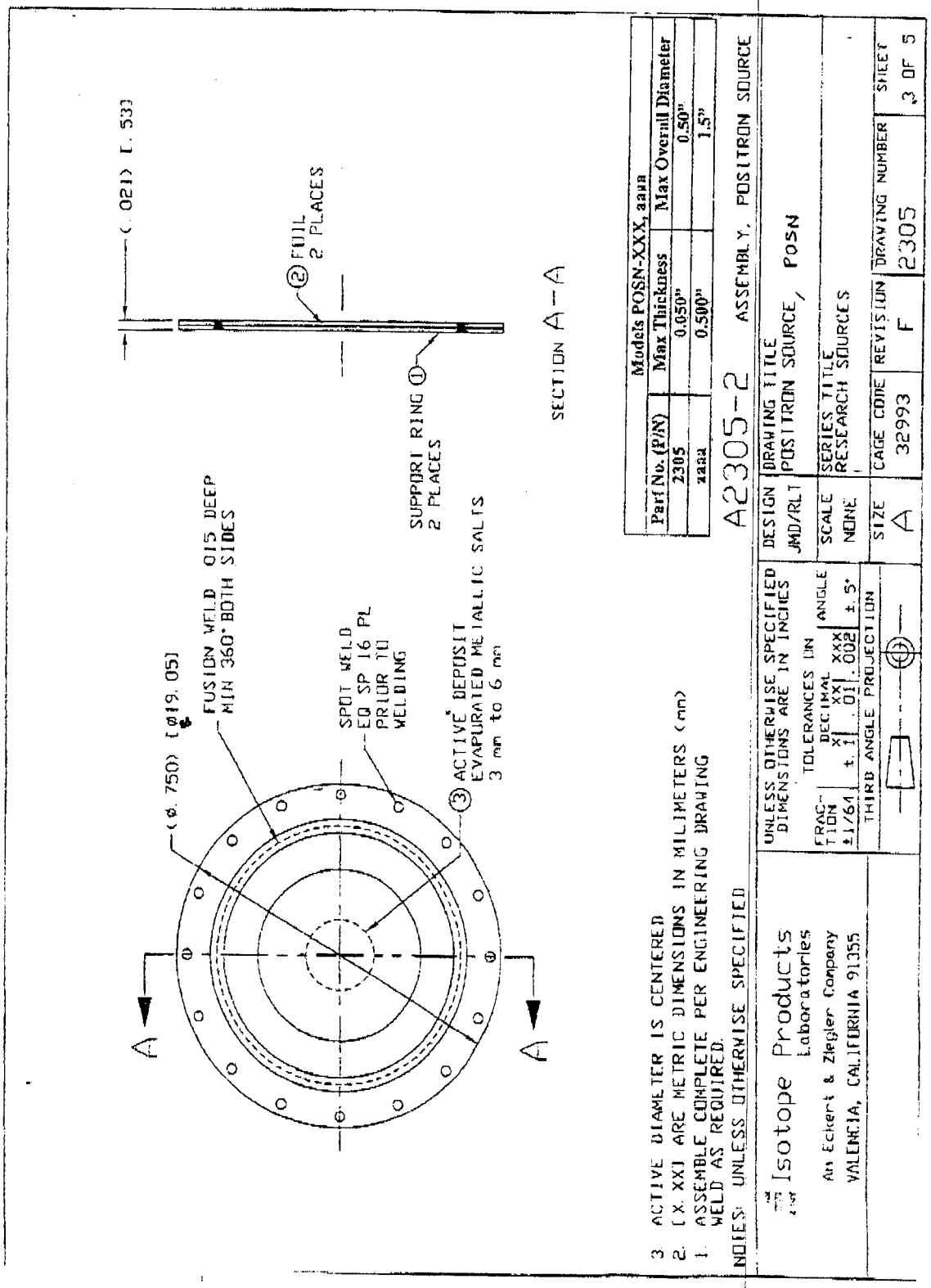
REGISTRY Or RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: **August 25, 2006** Attachment 4
SEALED SOURCE TYPE: Gamma Calibration Source



REGISTRY Or RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

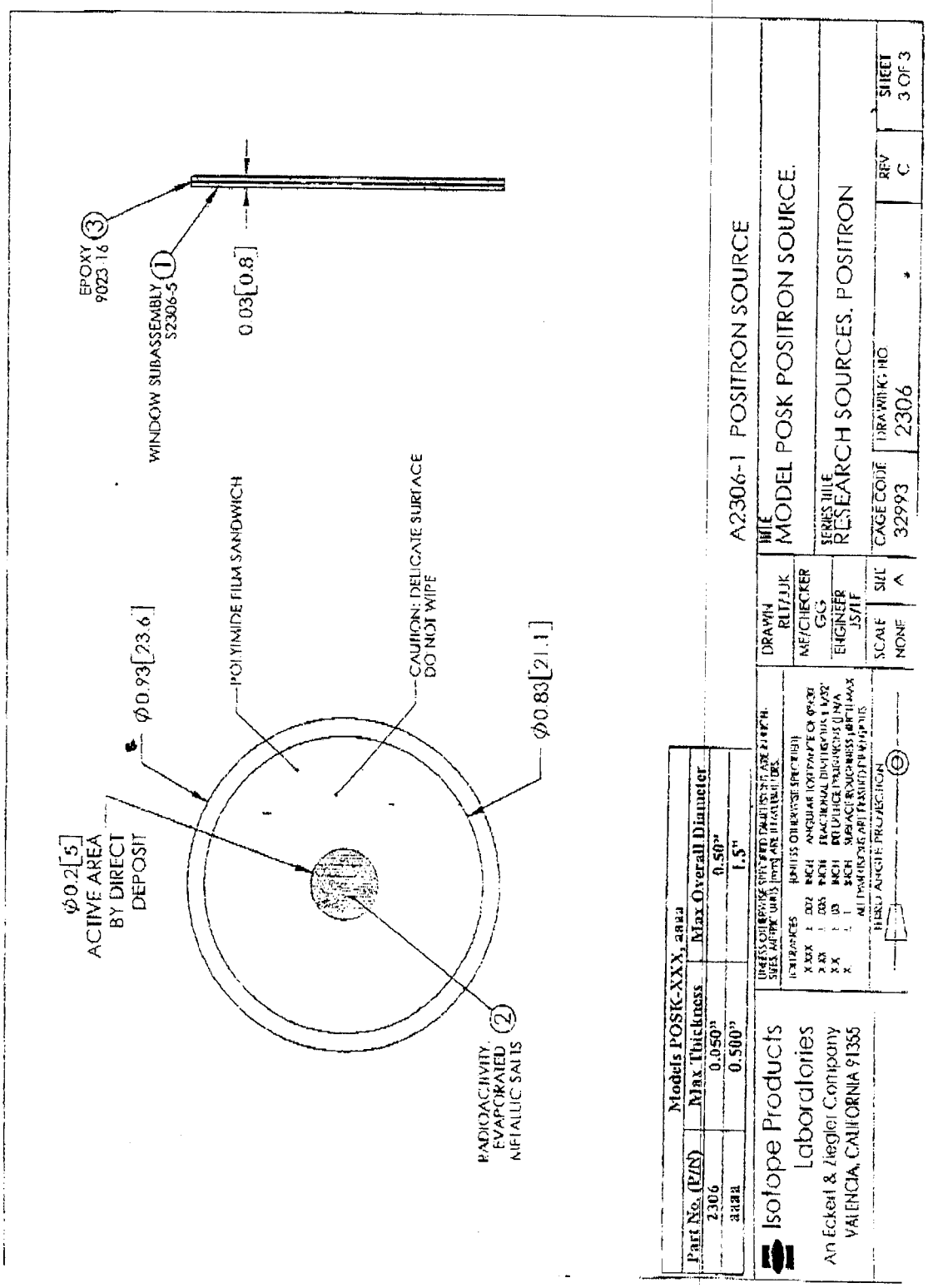
NO.: CA0406S106S DATE: **August 25, 2006** Attachment 5
SEALED SOURCE TYPE: Gamma Calibration Source



Models POSN-XXX, aaaa		
Part No. (P/N)	Max Thickness	Max Overall Diameter
2305	0.050"	0.50"
aaaa	0.500"	1.5"

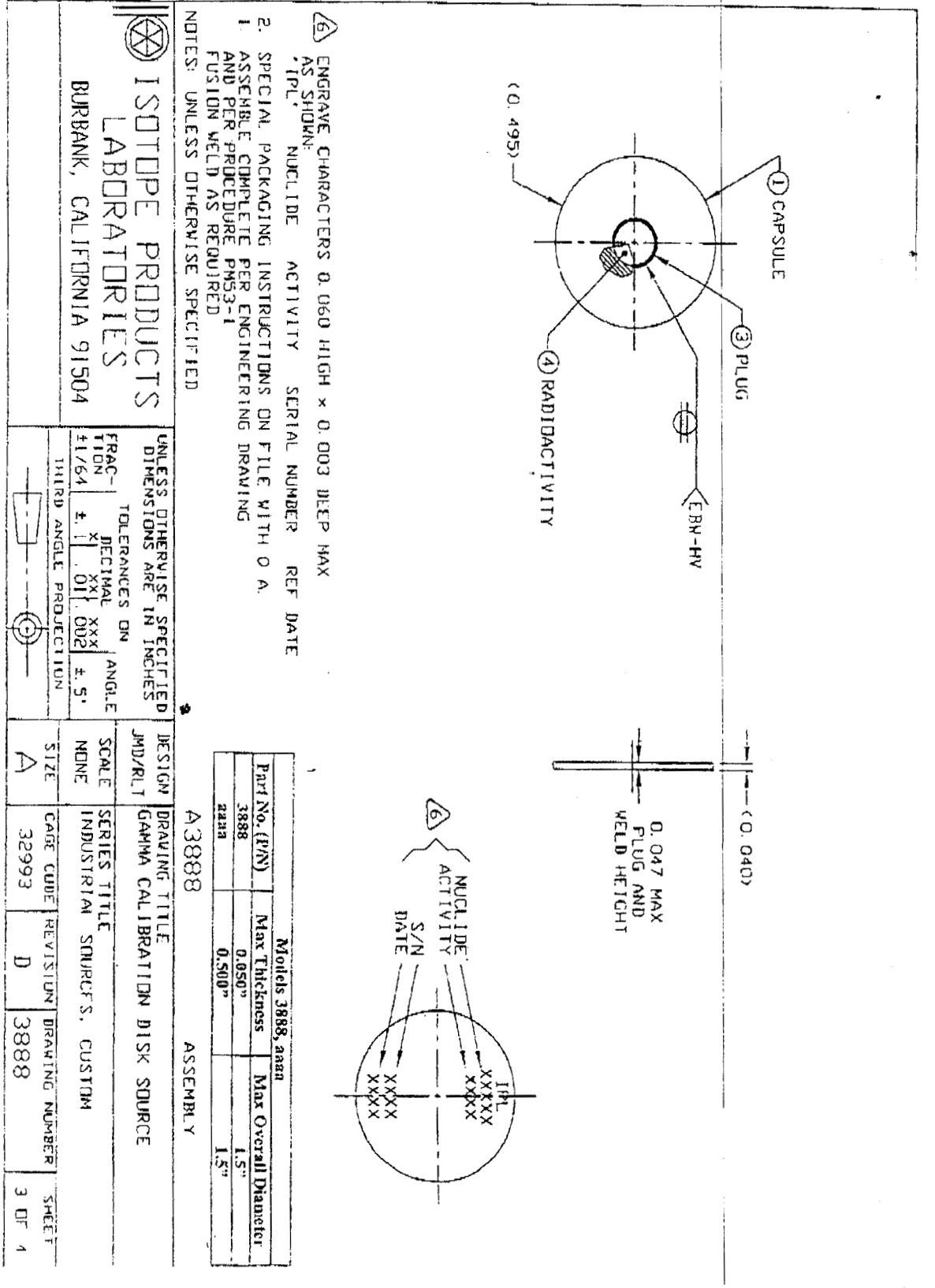
REGISTRY Or RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: **August 25, 2006** Attachment 6
SEALED SOURCE TYPE: Gamma Calibration Source



REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: **August 25, 2006** Attachment 7
SEALED SOURCE TYPE: Gamma Calibration Source



6. ENGRAVE CHARACTERS 0.060 HIGH × 0.003 DEEP MAX AS SHOWN:
'IPL' NUCLIDE ACTIVITY SERIAL NUMBER REF DATE
2. SPECIAL PACKAGING INSTRUCTIONS ON FILE WITH Q.A.
1 ASSEMBLE COMPLETE PER ENGINEERING DRAWING AND PER PROCEDURE PM53-1
FUSION WELD AS REQUIRED
NOTES: UNLESS OTHERWISE SPECIFIED

Models 3888, 3888A		
Part No. (P/N)	Max Thickness	Max Overall Diameter
3888	0.050"	1.5"
3888A	0.500"	1.5"

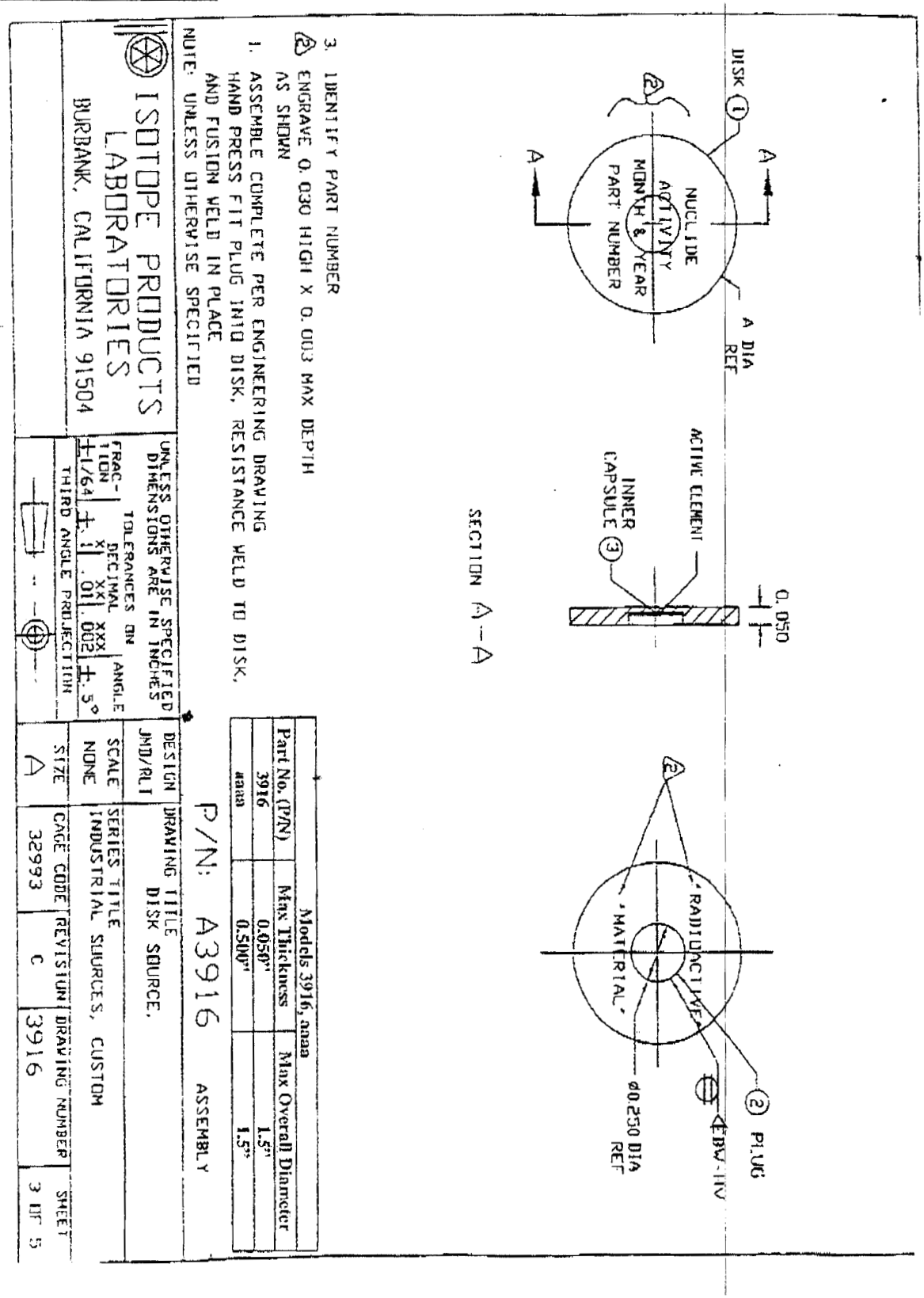
ISOTOPE PRODUCTS LABORATORIES
BURBANK, CALIFORNIA 91504

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTION ±1/64
DECIMAL X ±.1 XX .01 XXX .002
ANGLE ±.5°
THIRD ANGLE PROJECTION

DESIGN JMD/RLT
DRAWING TITLE GAMMA CALIBRATION DISK SOURCE
A3888 ASSEMBLY
SIZE A
SCALE NONE
SERIES TITLE INDUSTRIAL SOURCES, CUSTOM
CAGE CODE 32993
REVISION D
DRAWING NUMBER 3888
SHEET 3 OF 4

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCES
(AMENDED IN ITS ENTIRETY)

NO.: CA0406S106S DATE: **August 25, 2006** Attachment 8
SEALED SOURCE TYPE: Gamma Calibration Source



Models 3916, aaaa	
Part No. (P/N)	Max Thickness	Max Overall Diameter
3916	0.050"	1.5"
aaaa	0.500"	1.5"

Application for Material License response attachment

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR MATERIAL LICENSE

NRC FORM 313

(10-2005)
10 CFR 30, 32, 33,
34, 35, 36, 39, and 40

Item No. 6

PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED

ITEMS 6: PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED

Regulations: 10 CFR 30.33(a)(1).

In response to item 6, NRC form 313, Purposes for which licensed material will be used, Polimaster Technology, Inc intends to possess sealed sources, shown in item 5, for calibration purposes:

Instrument and/or Dosimetry Calibration Service Providers:
Possession of sealed sources will be used for commercial calibration of radiation survey instruments and/or personnel dosimetry per 10CFR 30.33(a)(1).

Item No. 7
INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

ITEM 7: INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

In response to item 7, NRC form 313, Individual responsible for radiation safety program, Polimaster Technology, Inc presents Matthew M. Kish as the Radiation Safety Officer.

Formal Training: Completed Nevada Technical Associates, 40 hours RSO course on September 18th – 22nd of 2006 with written and group exercises and written final examination.

Nevada Technical Associates, Inc.
P.O. Box 90748
Henderson, Nevada 89009

Phone 1-702-564-2798, Fax: 1-702-558-7672, Email: nta@ntanet.net

Course was presented by Dr Holloway and Ted Allen, CHP. Course covered the following:

1. Introduction
   - Course objectives and schedule
   - Origins of nuclear science
   - Atomic structure, isotopes, nuclear stability
   - Equations of radioactive decay
2. Radioactive Decay Processes
   - Alpha emission
   - Beta emission
   - Gamma emission
   - Other decay processes
   - Statistics of radioactive decay
3. Radiation Detection and Measurement
   - Gas-filled chambers
   - Scintillation detectors
   - Semi-conductors
   - Photographic emulsions
4. Interaction of Radiation with Matter
   - Modes of interaction
   - Heavy charged particle interactions
   - Beta particle interaction
   - Gamma ray interaction
   - Neutron interaction

5. Biological Effects of Radiation
   - Radiation quantities and units
   - Quality factors
   - Biological effects
   - Mechanisms of biological damage
   - Acute, whole-body gamma radiation
   - Risk of stochastic effects
   - Fatality rates in various industries
   - Radiation dose from natural and man-made sources
6. Shielding
   - Charged particle shielding
   - Photon shielding
   - Neutron shielding
   - Facility shielding
7. Personnel Radiation Dosimetry Devices and Methods
   - External monitoring
   - External dose evaluation
   - Internal monitoring
   - Internal dose assessment
8. Federal and State Regulations
   - Chronology of standards
   - Sources of standards, recommendations and requirements
   - Basis of Standards
   - Current regulations
   - Licensing procedures
9. Radiological Safety Surveys, Records and Documentation
   - Surveys and inspections
   - Radiological Controls and ALARA
   - Records and documents
   - Operating and emergency procedures and document control
10. Radioactive Material Transportation and Disposal Regulations
    - Applicable regulations
    - Categories, packaging and limits
    - Manifests, records, markings, and labels
    - Radwaste disposal methods, sites, records and regulations
11. Radiological Emergencies
    - Definitions, classifications and phases
    - Notifications and assistance
    - Response: isolation, radiation and medical evaluations
    - Review of accident causes and recent accidents
12. Drafting a Radiological Safety Plan (student exercise)
    - Attendees prepare program
    - Exercise review

Application for Material License response attachment

Certificate of Training attached, RSO Figure 1.

ITEM 7: INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE (Continued)

Practical Experience:

Experience operating, maintaining, and programming X-Ray equipment as used in the electronic manufacturing industry. (CR TECHNOLOGY CRX-2000 Real Time Xray Imaging System with Hamamatsu 130kVp Micro-Focus Source) (Patapsco Designs, Inc, Maryland 1998-2000) Assisted facilities management in establishing "Radiation Area" and marking safe zone from hot zone using support information from equipment manufacturer recommendations. In addition I assisted in creation of TLD distribution program to Radiation Workers, optimum placement location of TLD for each operator, and location of TLD storage rack in a RAD Free area of our facility (for when the TLDs were not in use.)

Finally, I was responsible for all programming and maintenance of our X-ray equipment. This included testing of all interlocks, visual inspection of all leaded covers, and general common-sense items that could cause any problems. Management provided me with authority to cease all use of equipment in the event of any questionable occurrences.

Developed a secure radiation area, implemented safety procedures, and ALARA practices at Griffin Limited (Baltimore, Maryland 2003-2004) while manufacturing Polimaster instruments as Electronic Contract Manufacturer, using exempt quantities of Cs-137. Received full support from Polimaster Inc, Nuclear PhD staff members along with 3-months of on-the-job training prior to receiving formal RSO training in 2006. Some of the controls we used were wearing electronic dosimeters to be alerted immediately if radiation exceeding threshold was present, "Time, Distance, Shielding" practices and mindset, frequent surveys of location using electronic search devices. In addition to the active controls, all sources were installed in leaded containers with directional window openings to allow only the smallest necessary radiation beam come in contact with the units under test. All fixtures were placed in such a way that the radiation beam was directed away from the users and into a lead plate.

Additional experience operating and maintaining Polimaster Technology gamma and neutron test stands at NRC licensed facility. (Matric Limited, Seneca, PA 2006-2007) Furthermore I was brought into the company to liaise between Polimaster Nuclear PhD staff and our Electronic Contract Manufacturer staff in order to help establish NRC license at our ECM facility and provide manufacturing support.

ITEM 7: INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

RSO Figure 1.

Matthew Kish

has successfully completed the Technical Short Course entitled

Radiation Safety Officer Course

September 18th – 22nd 2006

Presented in Las Vegas, NV the 22nd day of September

By Nevada Technical Associates, Inc.

Robert Holloway

Robert Holloway, Ph.D
Course Coordinator

Item No. 8

TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

ITEM 8: TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

In response to item 8, NRC form 313, Training for Individuals Working in or Frequenting Restricted Areas, Polimaster Technology, Inc will follow the training described in Appendix H of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."

Authorized Users

"Before using licensed material, authorized users will receive the training described in Appendix H of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."

Ancillary Personnel

"Before using licensed material, authorized users will receive the training described in Appendix H of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."

Item No 9

FACILITIES AND EQUIPMENT

ITEM 9: FACILITIES AND EQUIPMENT

In response to item 9, NRC form 313, Facilities and Equipment, Services that involve handling of sealed sources outside a shielded container, please see the attached descriptions:

Submit a drawing or sketch of the proposed permanent facility identifying areas where radioactive materials, including radioactive wastes, will be used or stored.
(Attached as Drawing FAC01)

Show in the drawings the relationship and distance between restricted areas and adjacent unrestricted areas.
(Attached as Drawing FAC01)

Description of engineered safety systems, e.g., area monitors, interlocks, alarms, etc.
Polimaster Technology will use our PM1203M, Programmable Dosimeter for our area alarm and will provide Radiation Area Workers their own Programmable Dosimeter as needed.
(Attached as Drawing FAC01, 18 page Facilities and Equipment information, including technical specifications on dosimetry equipment.)

Item 9, Facilities and Equipment

Figure: FAC01

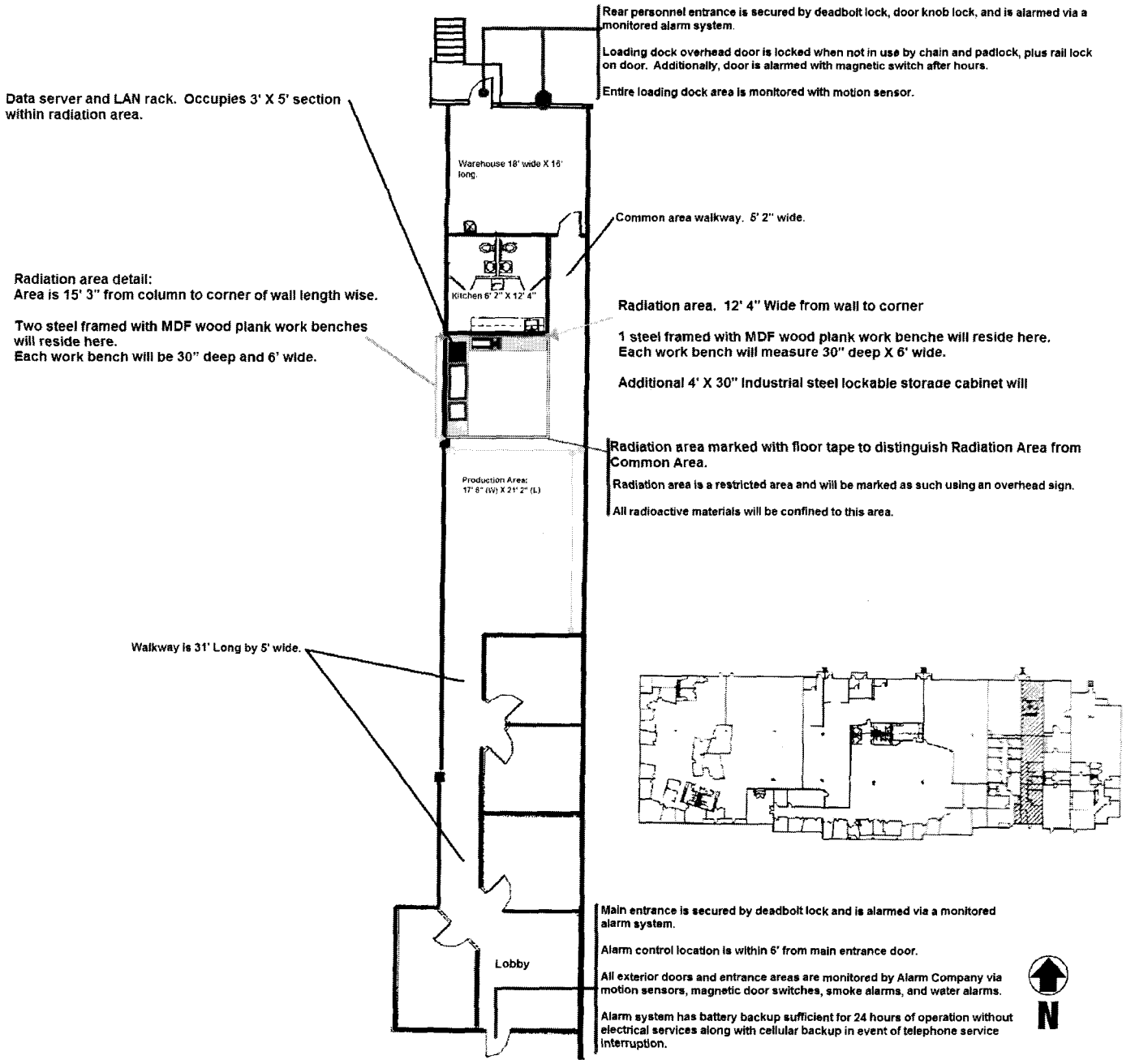
Polimaster Technology

Item 9, Facilities and Equipment

Figure: FAC01

44873 Falcon Place

1ST FLOOR: Suite 128 - 2,157 RSF



Polimaster Technology

Facilities drawing for Polimaster Technology, inc.

Edited by: Matthew Kish, RSO

Prepared on March 9, 2007

Intended use for NRC License Application only

Measurements in Inches

Cf-252 source (Polimaster Technology Part # OM6-054.000M) with the activity of 10.7 uCi have the neutron yield to 4 π steradian sphere:

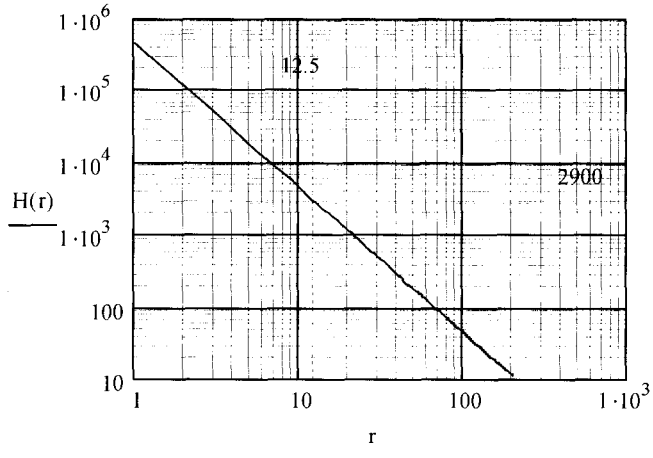
$$\frac{10.7}{6.49}\cdot 2.8\cdot 10^4 = 4.616\times 10^4$$

Assuming neutron energy as 2 MeV (average energy for Cs-252), the dose for single fluence of 2 MeV monoenergetic neutrons is $\Delta Hmax = 3.4*10^{-14}$ Sv*m^2 (the deposit of neutrons with energies other than 2MeV is negligible).

Thus way K = 1.224 (uSv/h)/(n^0/(cm^2*sec)) or 122.4 (uRem/h)/(n^0/(cm^2*sec)).

The dependence of dose equivalent rate on the distance is shown below (X axis – distance, cm; Y axis – DER, uRem/h):

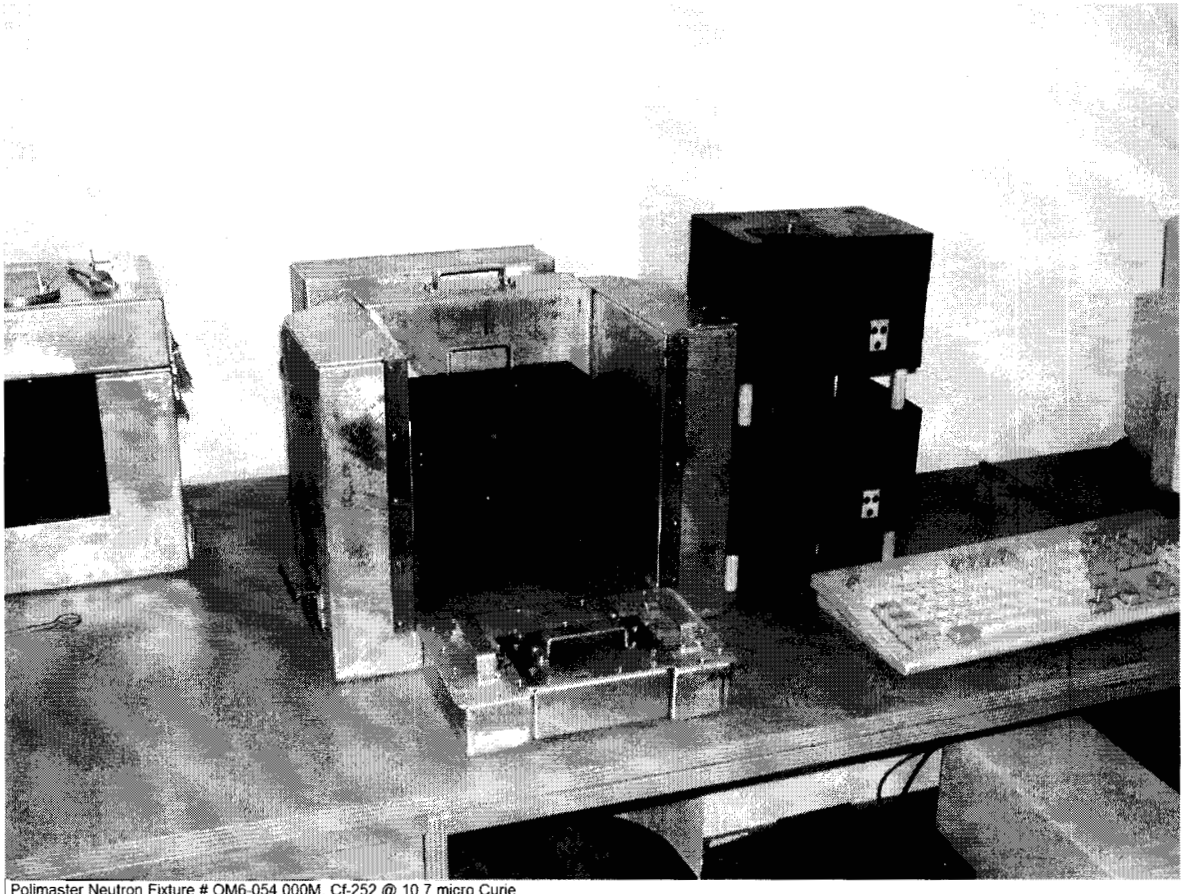
$r := 1..200$ $\qquad H(r) := \frac{4.616\times 10^4}{4\cdot\pi\cdot r^2}\cdot(122.4)$



The aluminum container size is 270*380 cm, i.e. at the distance of 25 cm the dose rate without any shield will be approximately 700 uR/h. The moderator lowers the neutron energy approximately 100 - 1000 times, the K coefficient at that lowering about 20 times, so DER lowers down to 35 uRem/h (normal neutron background is about 2.7 – 3.4 uRem/h). Boron enrichment of paraffin lowers DER approximately 1.5 – 3 times because of thermal neutrons absorption, finally gives not higher than 25 uRem/h DER at 25 cm distance from the source center. This calculation is approved by measurements using calibrated neutron radiometer MKS-02, the background count rate is about 0.001 cps while count rate at the 25 cm distance is about 0.01 cps (10 times background).

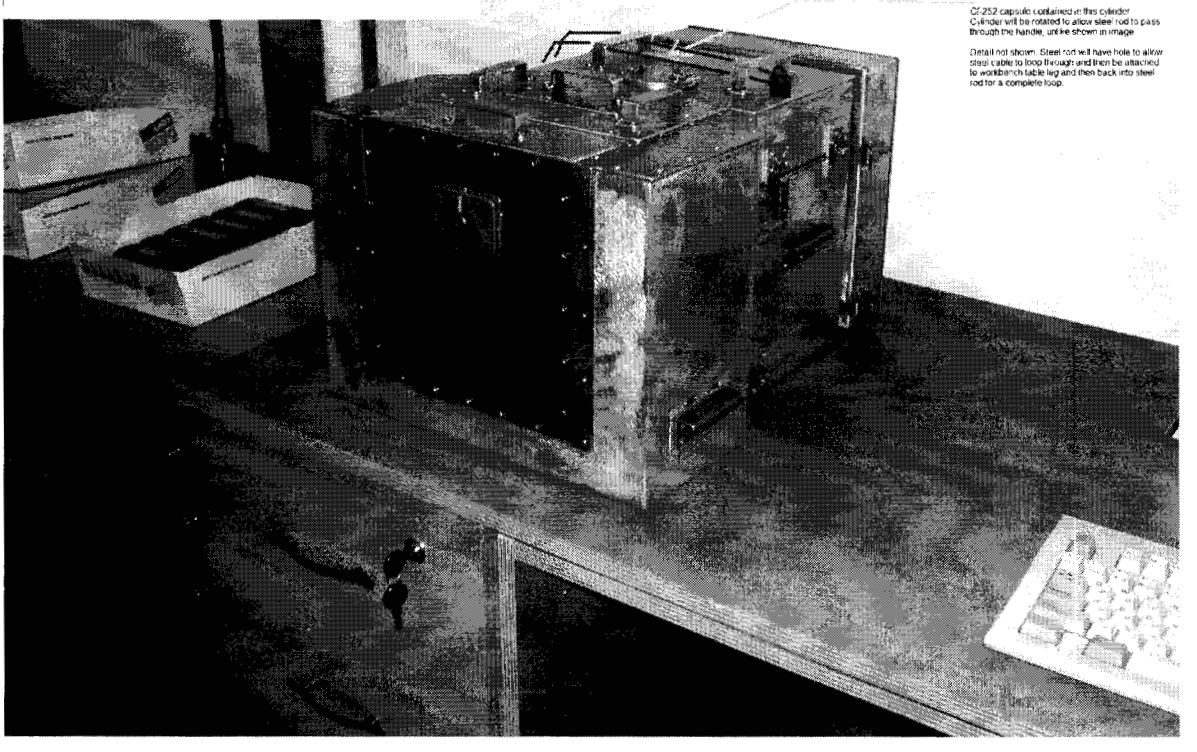
Polimaster Technology, Inc. Neutron fixture construction and operation brief

Neutron fixture has two main areas – the neutron source placement area and instrument under test placement area.
Neutron source placement area is composed of LDPE moderating box and the removable source container. Source container is made of lead and has a lead cover to block the concomitant gamma radiation from the source. LDPE moderator is placed to П-shaped (box with one side open) aluminum protection container. Aluminum container has double 2mm thick walls with 70 mm gap between walls. The gap is filled by boron enriched paraffin intended for neutron absorption (boron content 0.2~0.3 g/cm^3). When the fixture is not in use, the absent side of the aluminum protection container would be covered with the protection wall with have the same design as the primary walls (double 2 mm aluminum walls, 70 mm gap filled with boron enriched paraffin). Special latches are used to fix the protection wall to the main container. A cork from the top side of the container is intended for source container access. The construction of the cork is the same as one of the main container. Cork is securely fixed by the cover strap and the lock to prevent unauthorized access to the source.
The instrument under test placement area has exactly the same construction as the neutron source placement area. The box shape is also П-like (one side open). In operating condition two П-shaped boxes are located openings to each other ([ ]-like) providing complete entire shielding of source from all sides. Special latches are used to fix boxes to each other. Instruments under test are placing into individual moderating inserts (different shape for each instrument type). The instrument under test placement area has two observation windows with corresponding corks. Corks have the same construction as the main protection box.



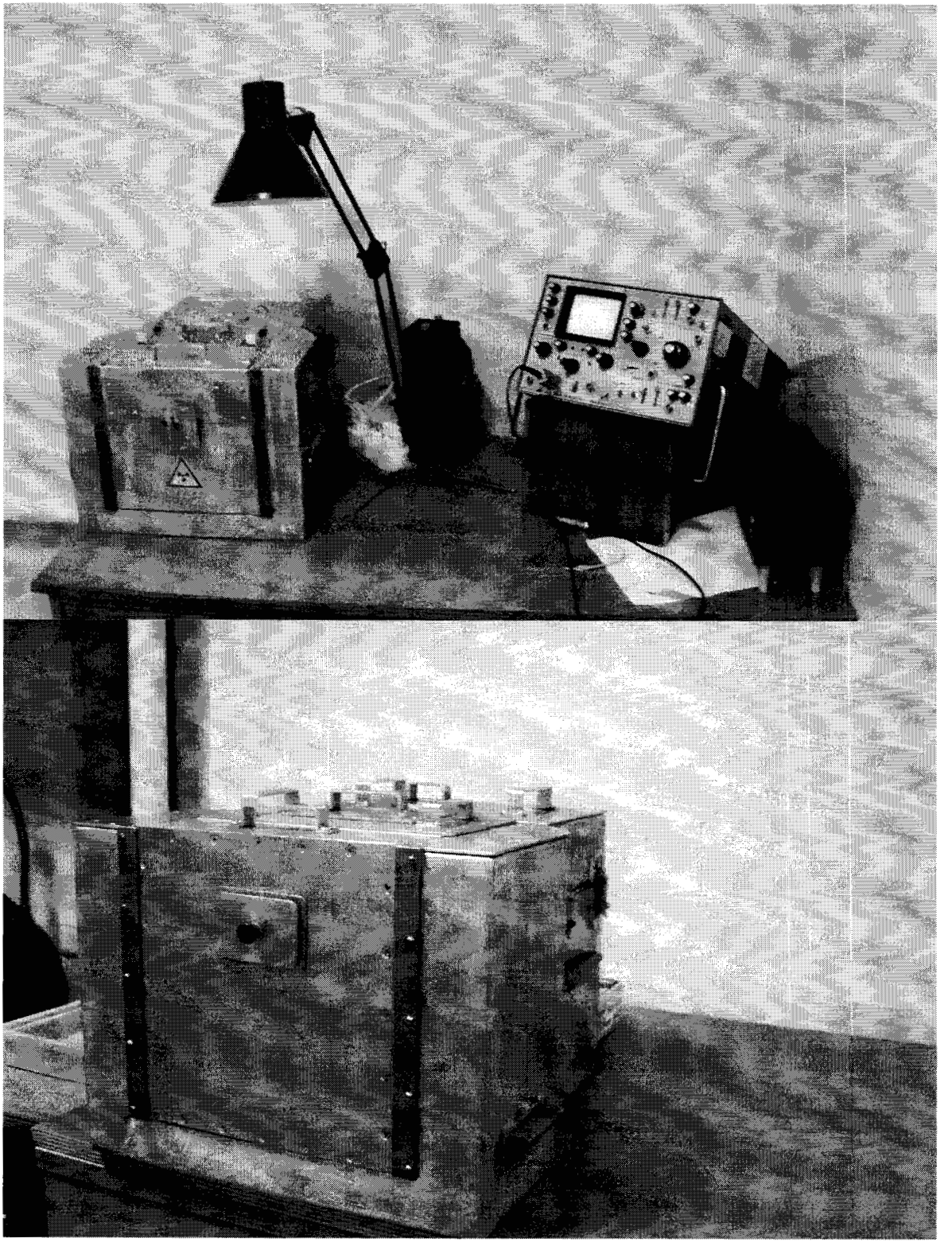
Polimaster Neutron Fixture # OM6-054.000M, Cf-252 @ 10.7 micro Curie

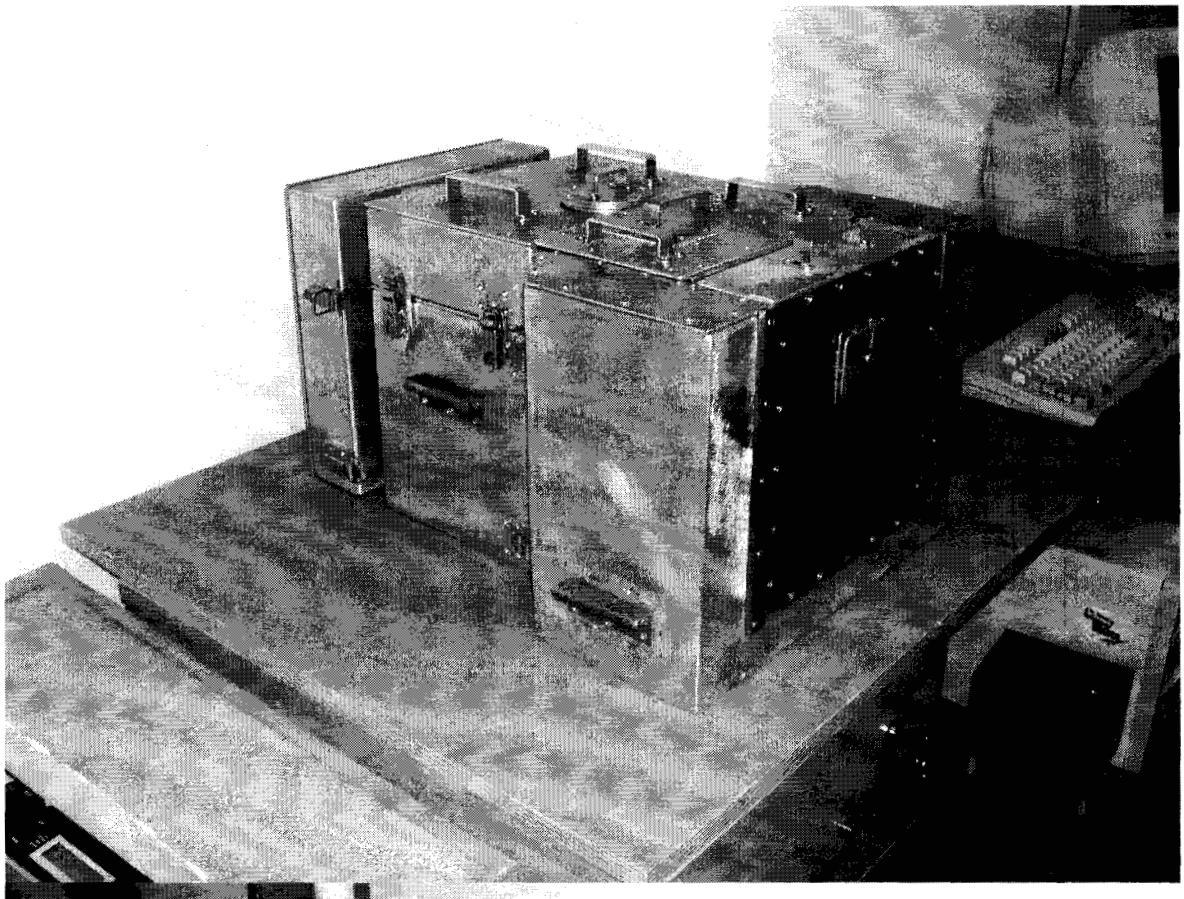
Cf 252 Fixture shown here. Cf 252 capsule is secured in fixture via a steel strap which is padlocked to prevent unauthorized removal. Entire fixture is tethered to the workbench using steel cable and padlock

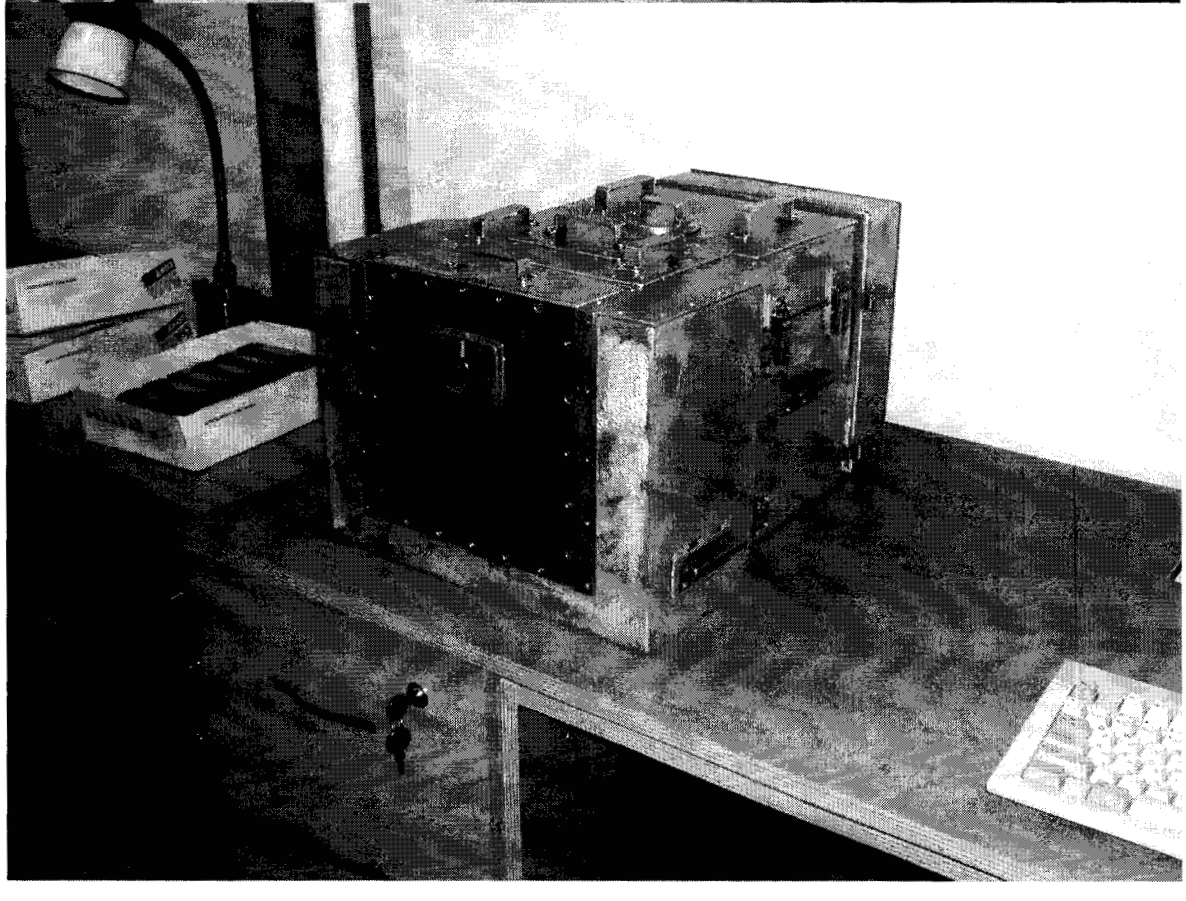


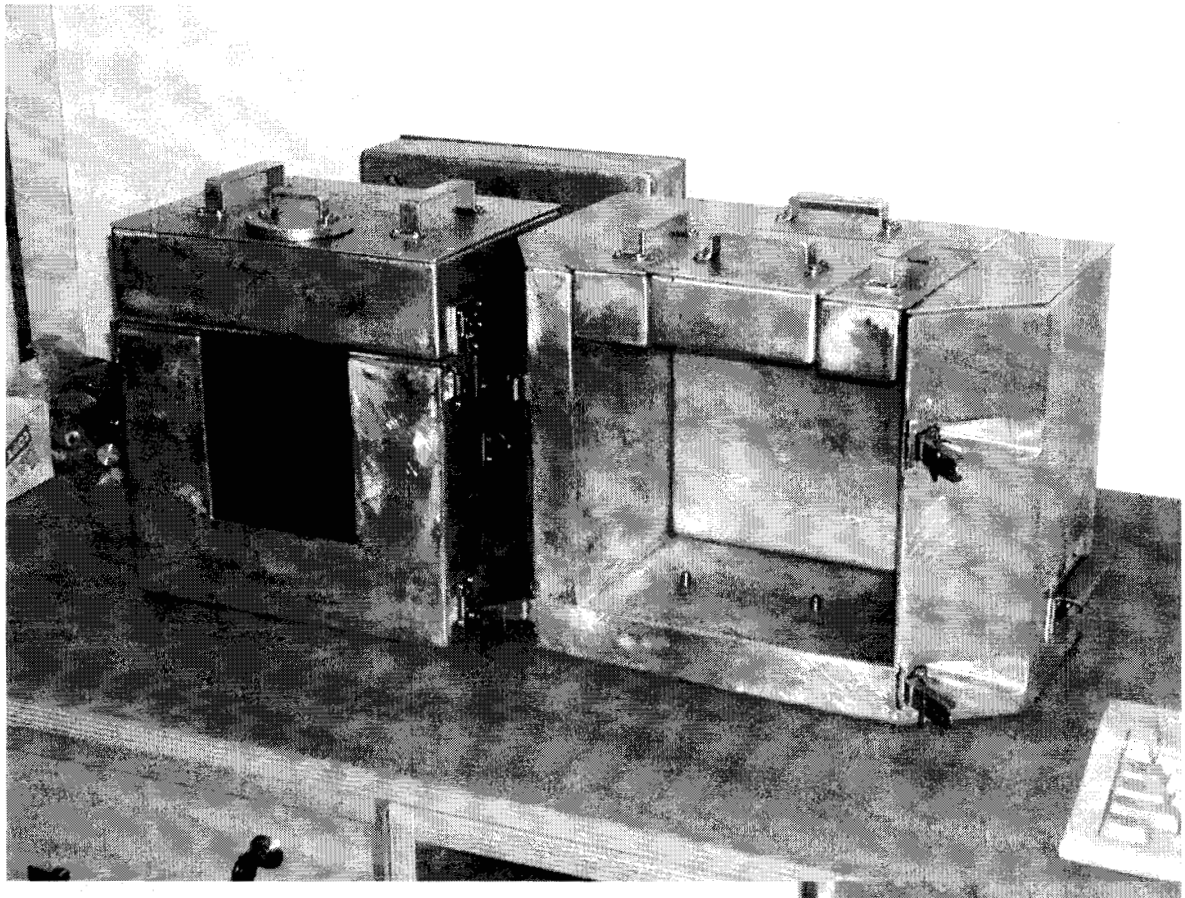
Cf-252 capsule contained in this cylinder. Cylinder will be rotated to allow steel rod to pass through the handle, unlike shown in image

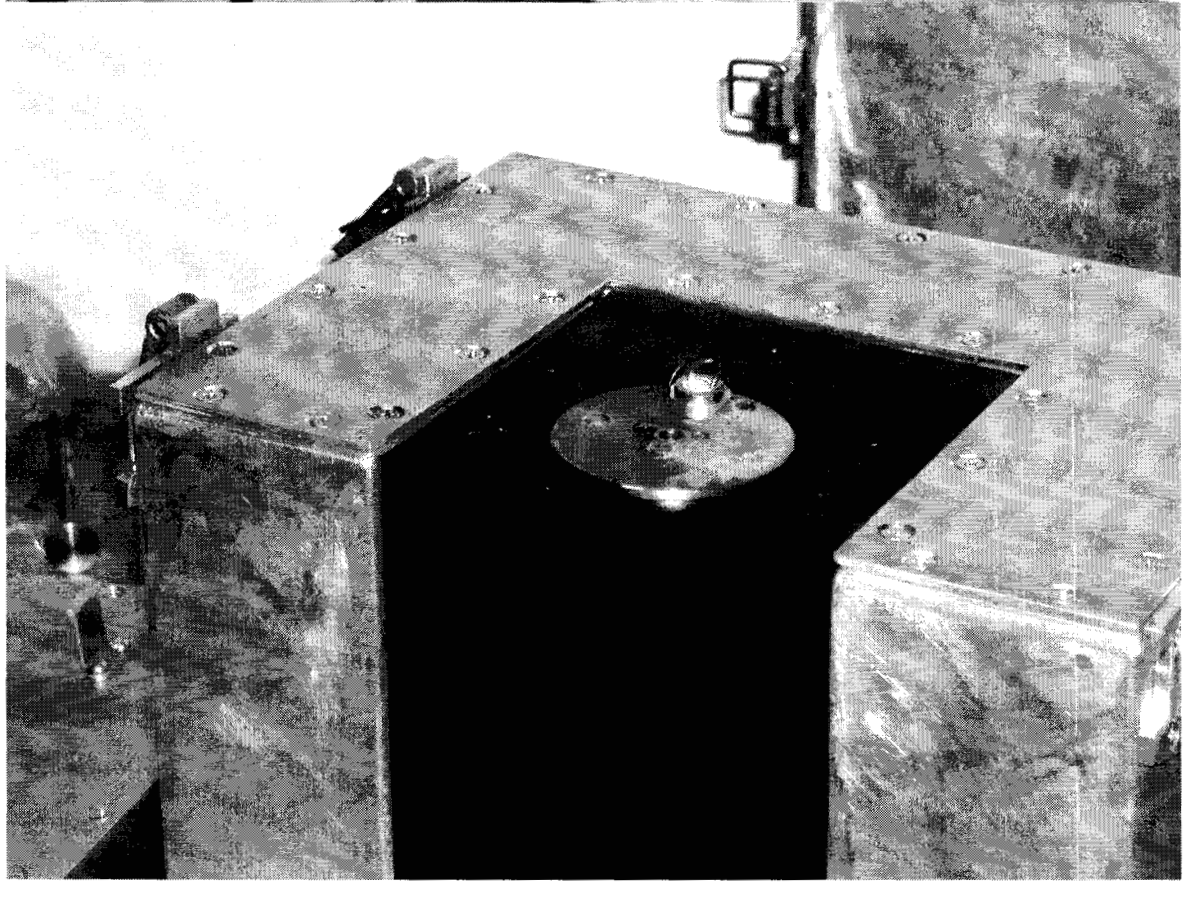
Detail not shown. Steel rod will have hole to allow steel cable to loop through and then be attached to workbench table leg and then back into steel rod for a complete loop.

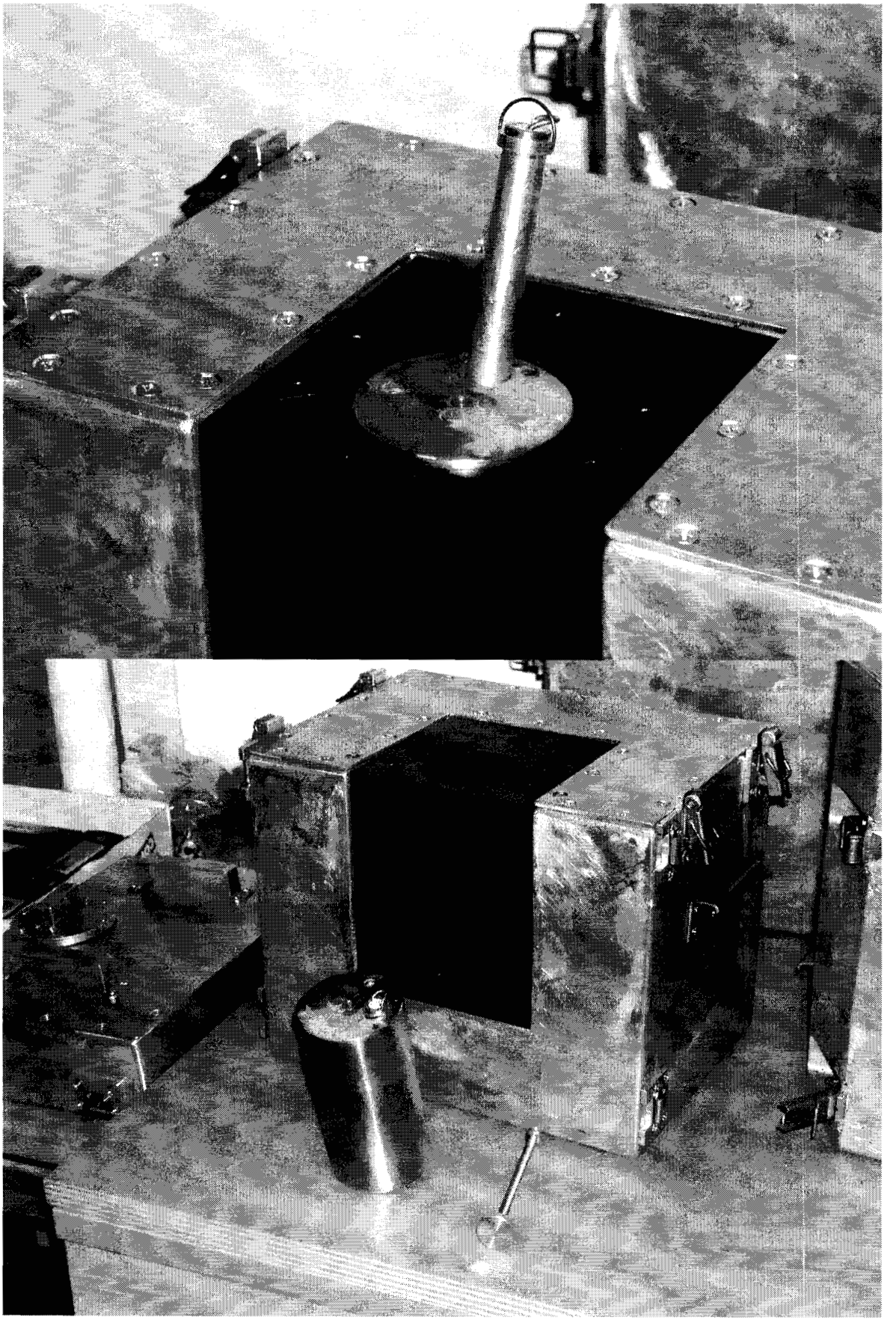


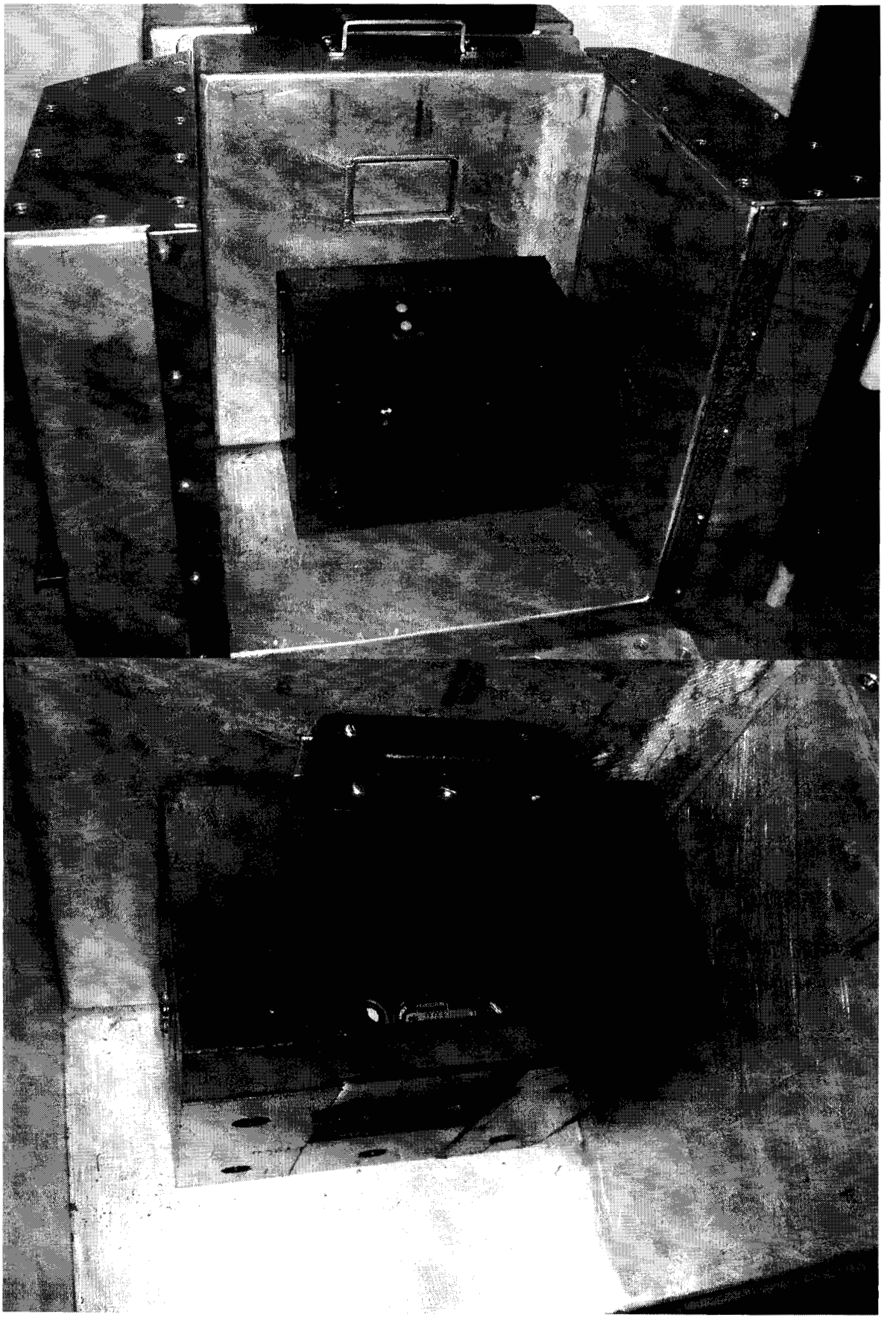












Cs-137 source with the activity of 3.5 mCi ($1.295*10^8$ Bq) produce 1.12 mR/h dose equivalent rate at the distance of 1 meter. (Polimaster Technology PN: OM6-790.200.000, Stand #2)

Source container walls are made of 10 cm thick lead and provide the radiation damping to the level of <1 uR/h on the container's outer wall surface (if no lead would present same source will produce 112 mR/h at the same point of observation)

$3.5*10^{-3} Cu$ equals $1.295*10^{8} Bq$

Dose equivalent rate at the distance of 1 meter $PCs1m = 1117.6\ uR/h$

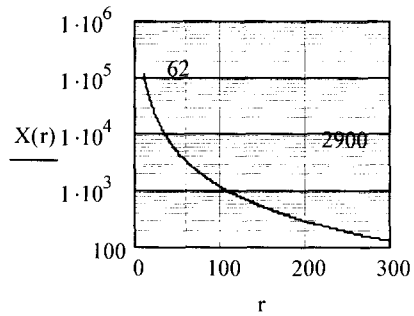
Dose equivalent rate at the distance of 10 cm $PCs10cm = 111762\ uR/h$

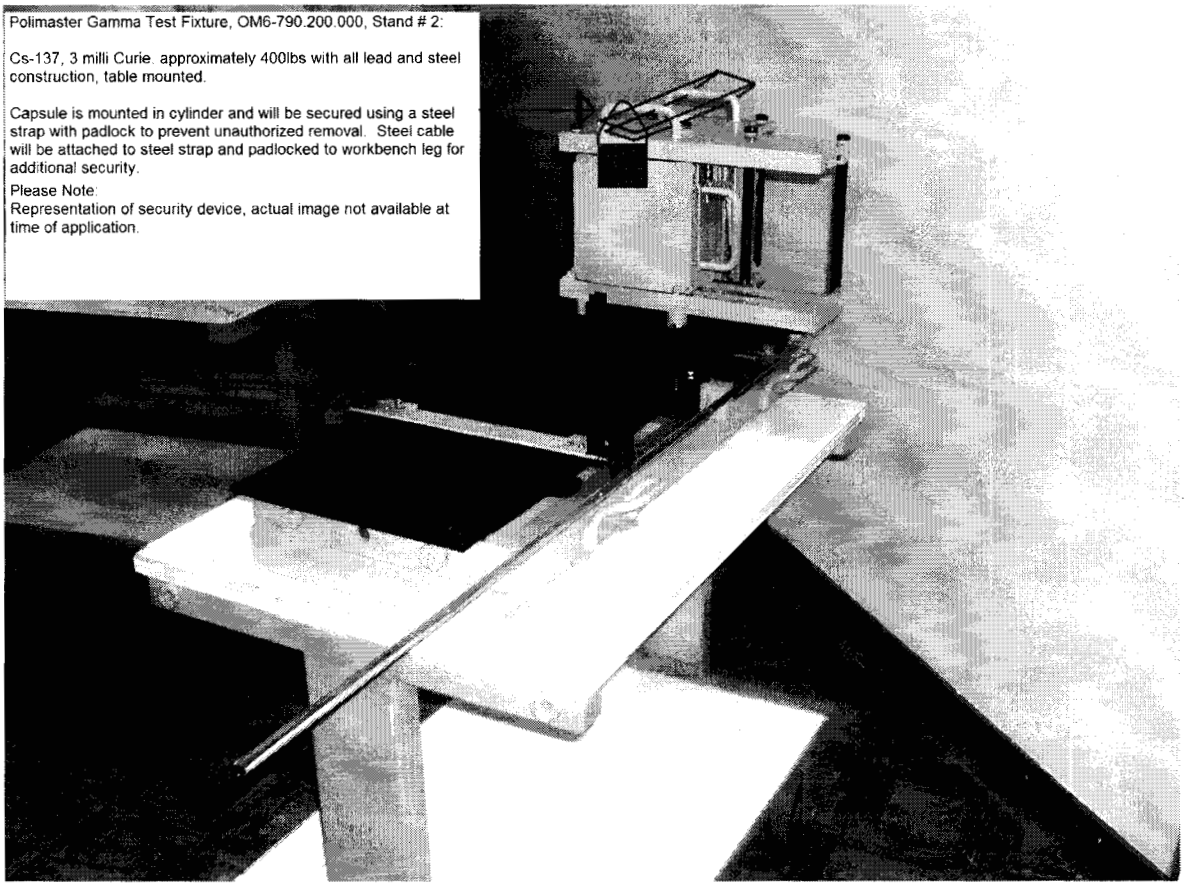
Dose equivalent rate at the distance of 10 cm of lead $PCs10cmZ = PCs10cmZ * e^{-1.18*10} = 0.839\ uR/h$

When the fixture is in operating condition (protective screen is open), the dose equivalent rate depends on the distance as shown below (X axis – distance, cm; Y axis – DER, uR/h):

$$X(r) := \frac{1117.62057100^2}{r^2}$$

r := 10.. 300 X(62) = 2.907×10^3



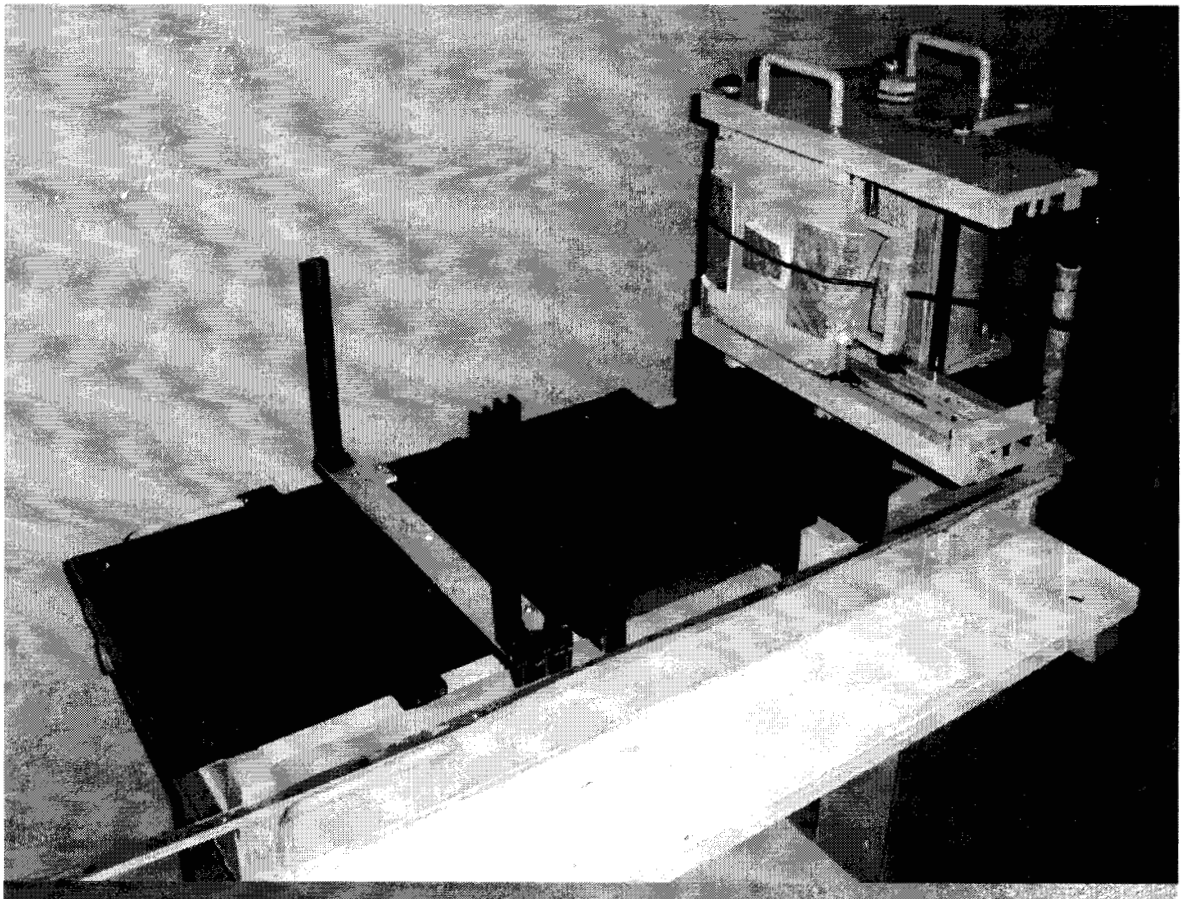


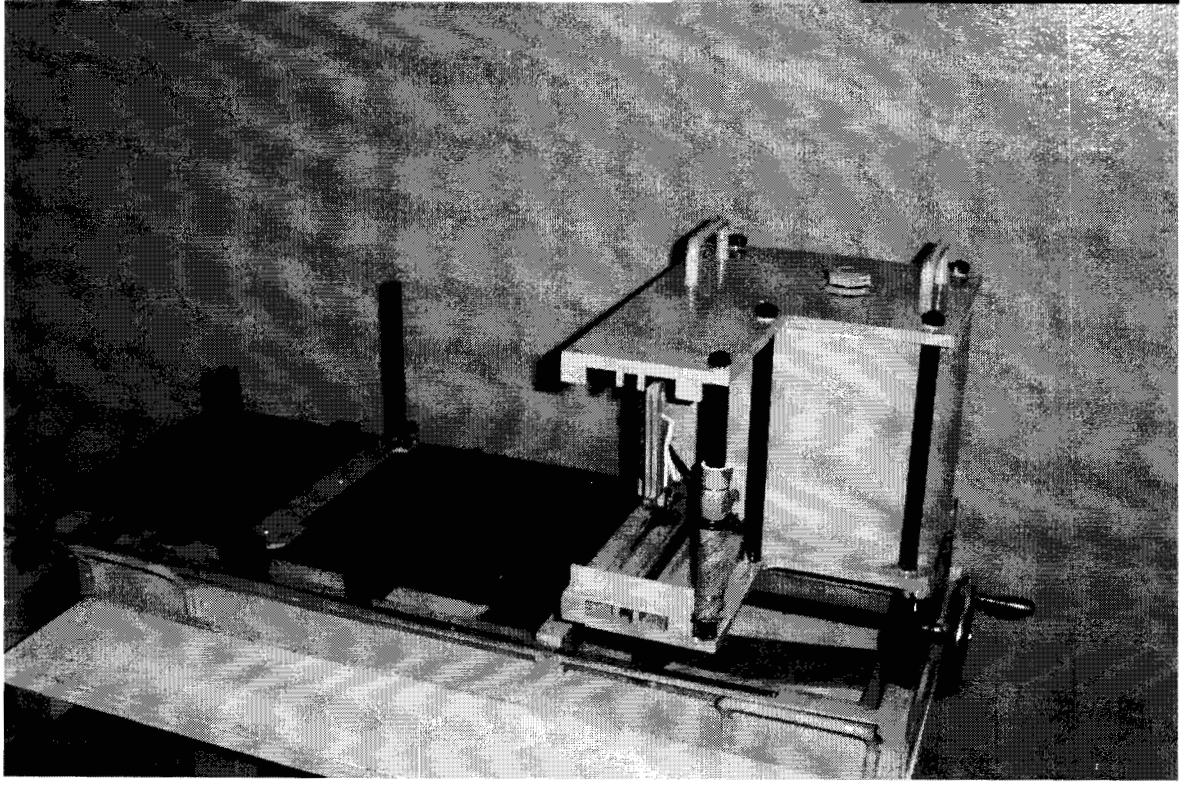
Polimaster Gamma Test Fixture, OM6-790.200.000, Stand # 2:

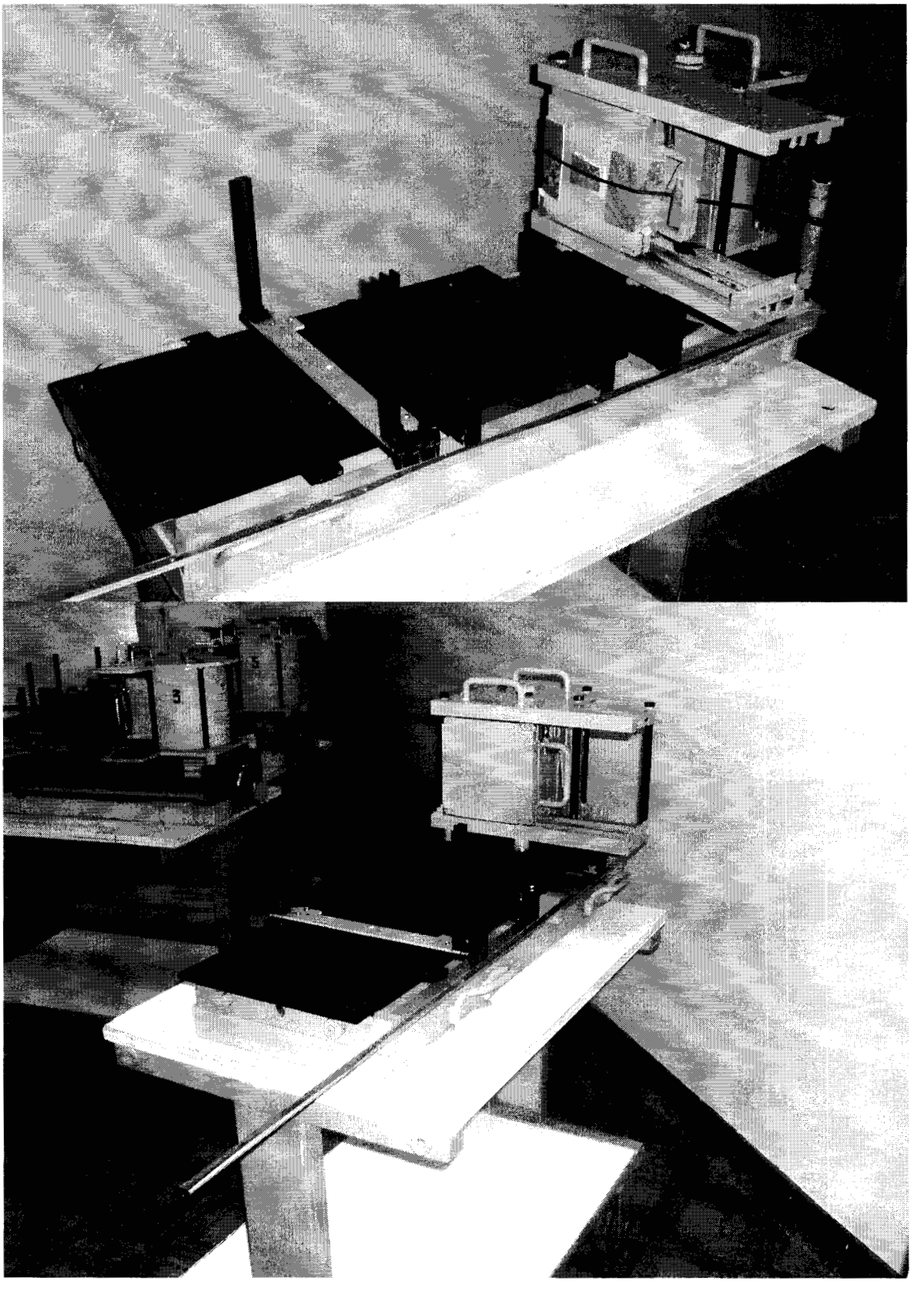
Cs-137, 3 milli Curie. approximately 400lbs with all lead and steel construction, table mounted.

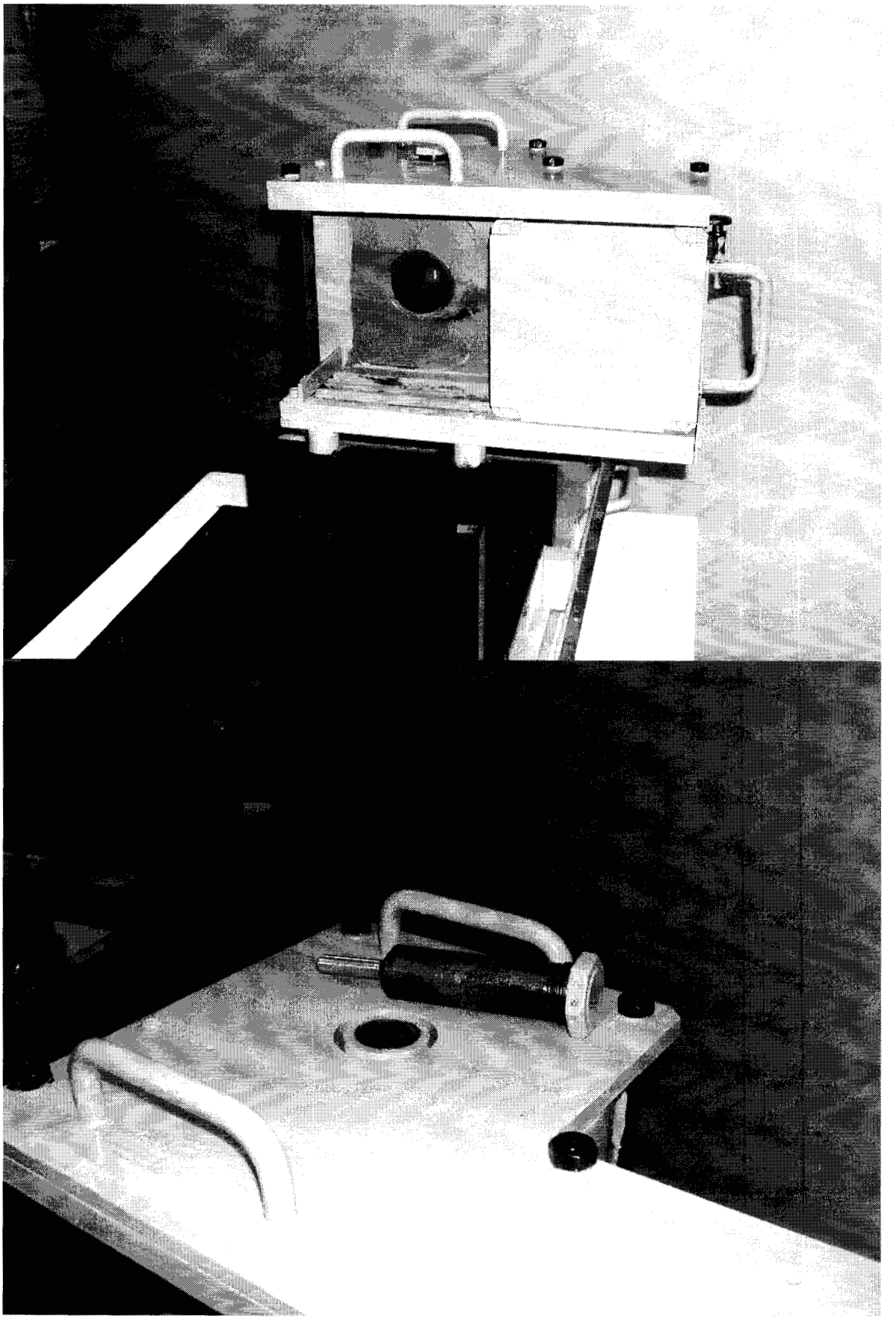
Capsule is mounted in cylinder and will be secured using a steel strap with padlock to prevent unauthorized removal. Steel cable will be attached to steel strap and padlocked to workbench leg for additional security.

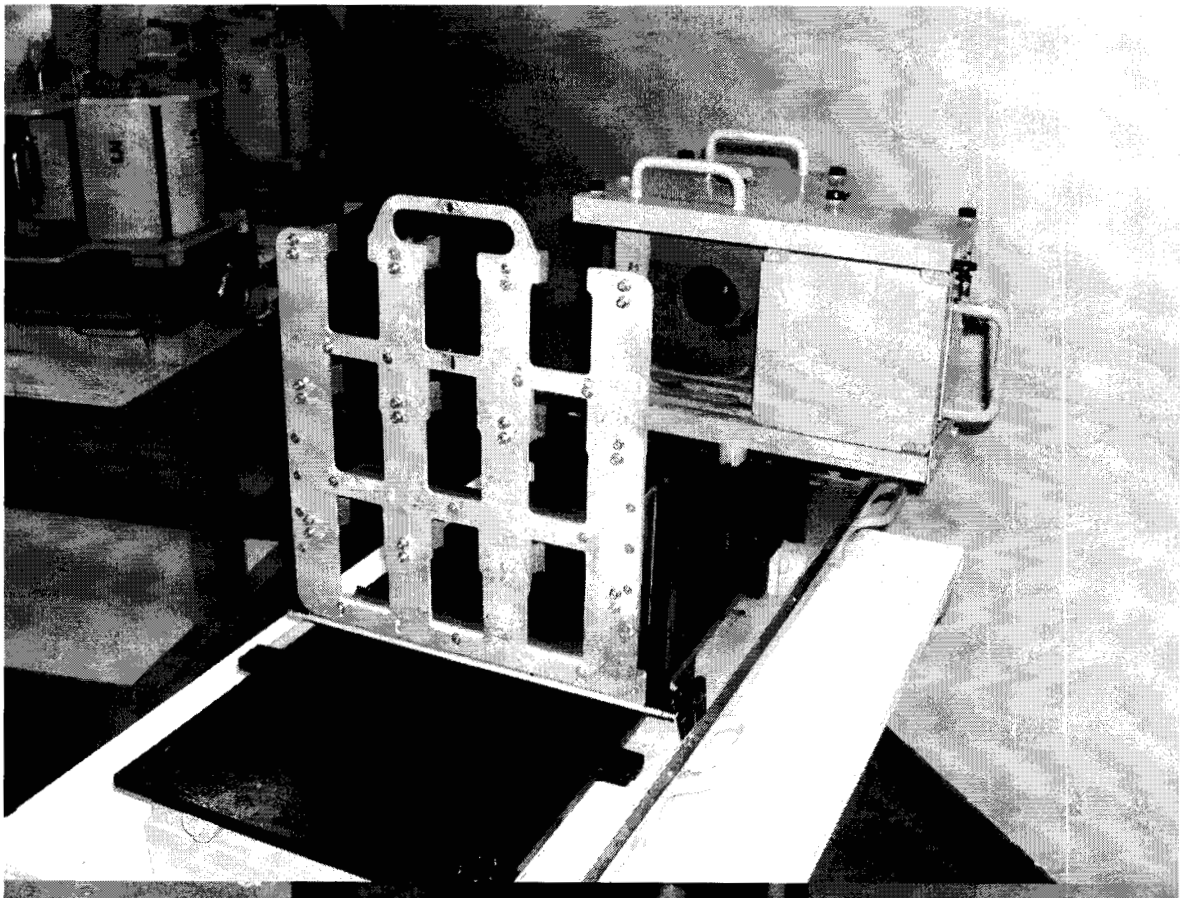
Please Note:
Representation of security device, actual image not available at time of application.

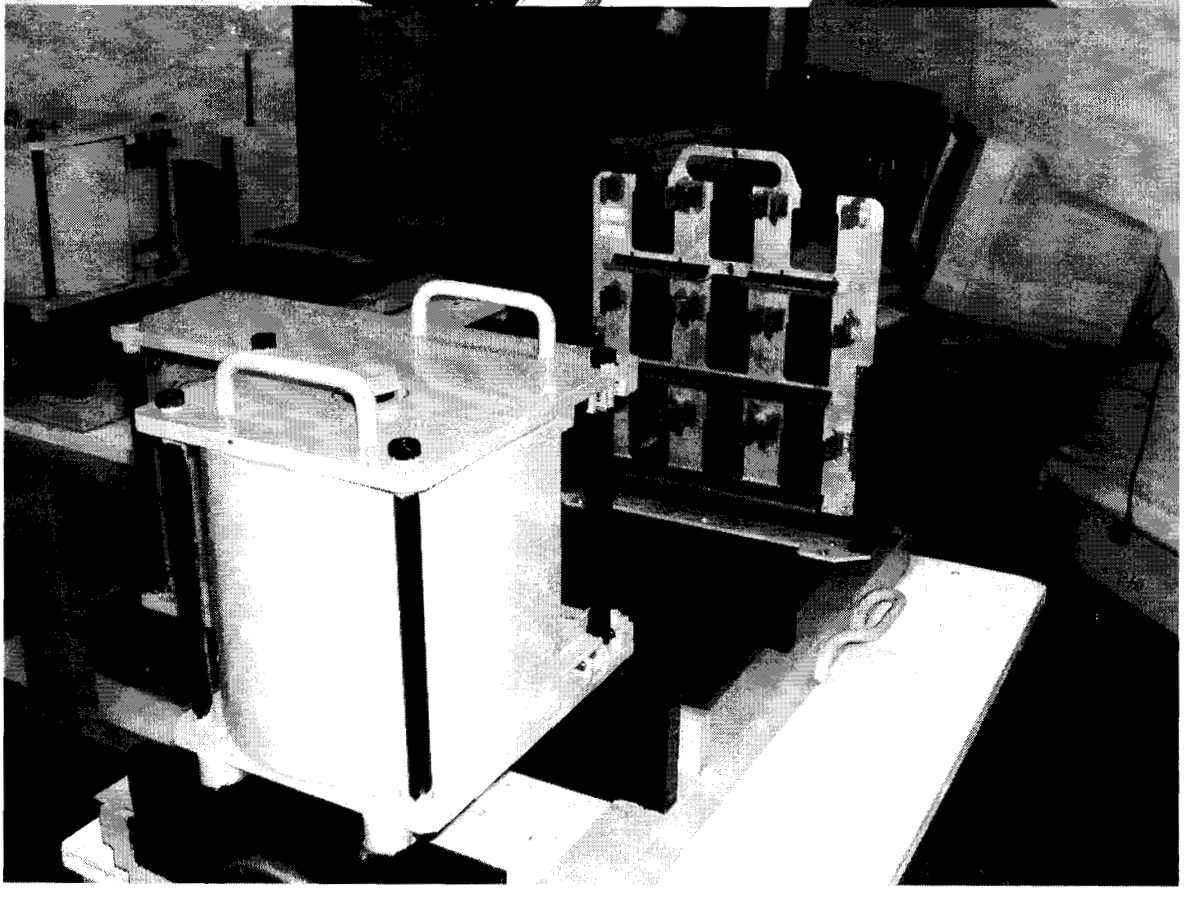


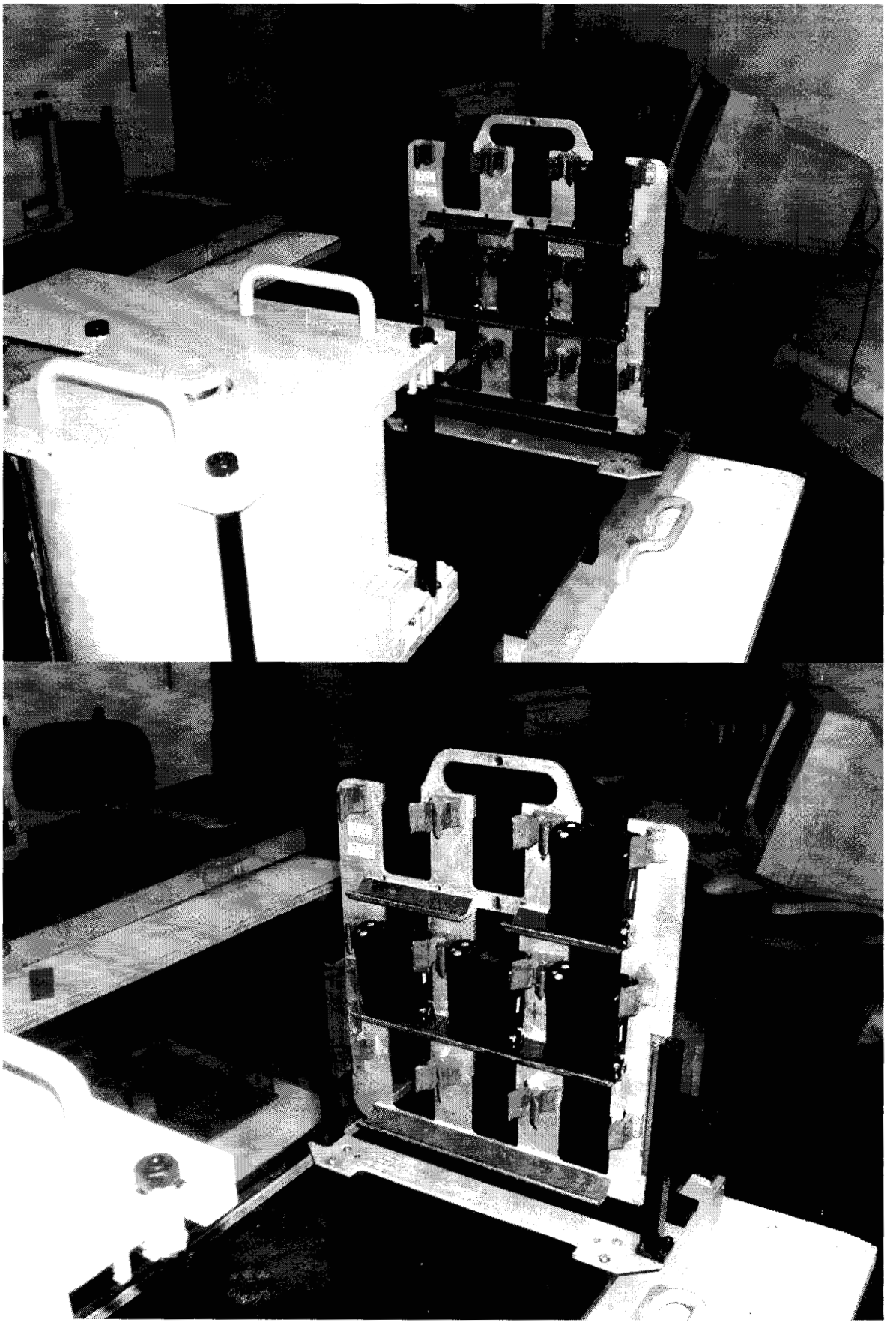


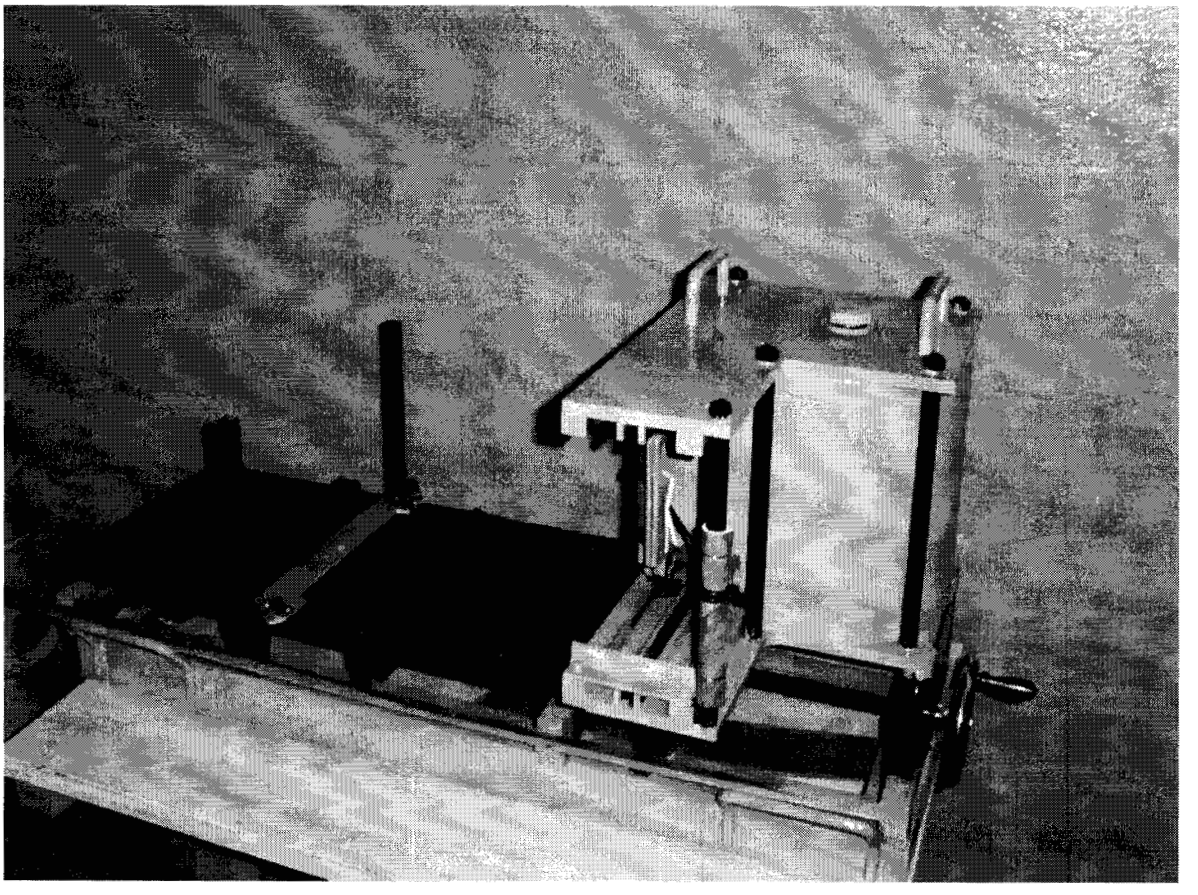


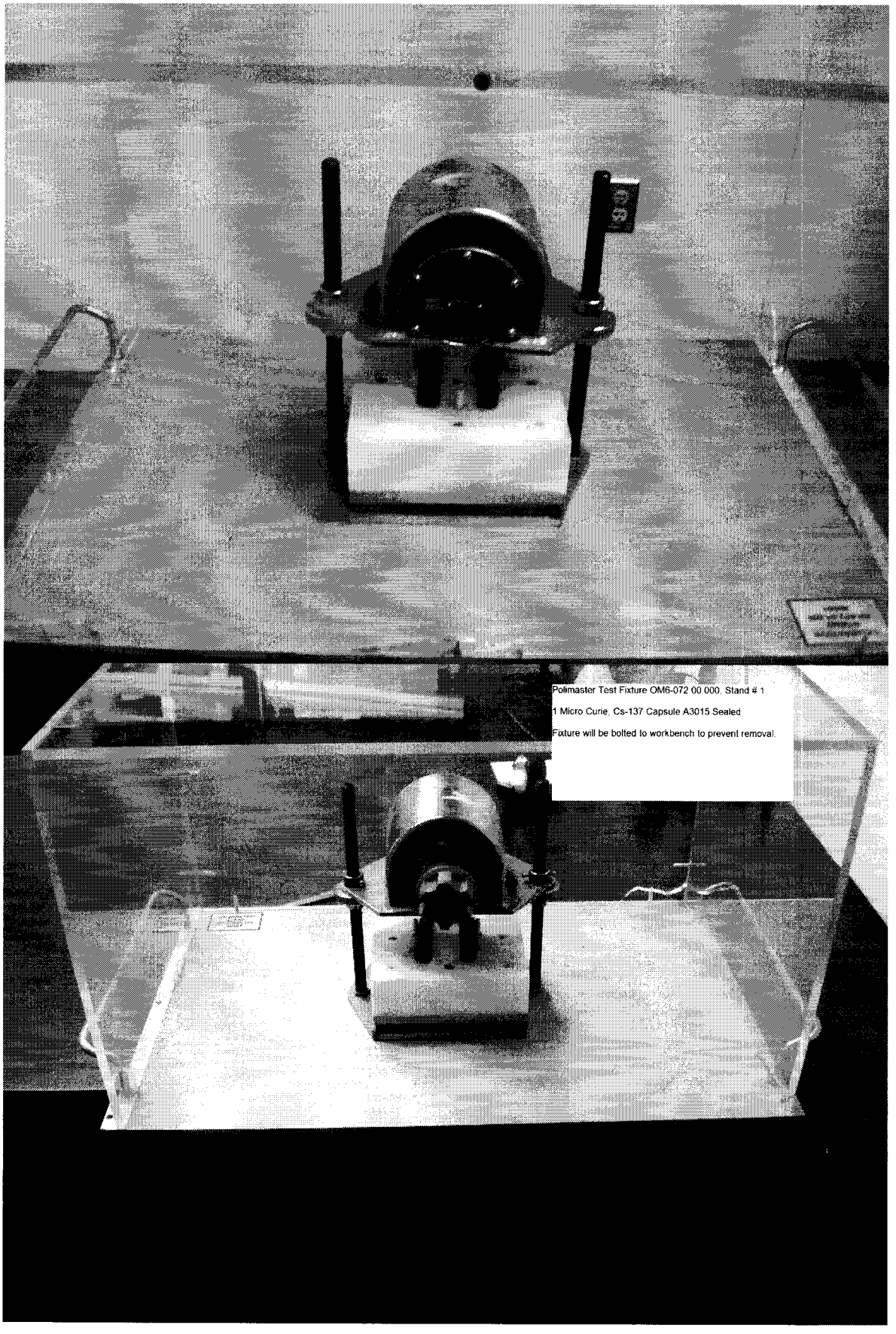


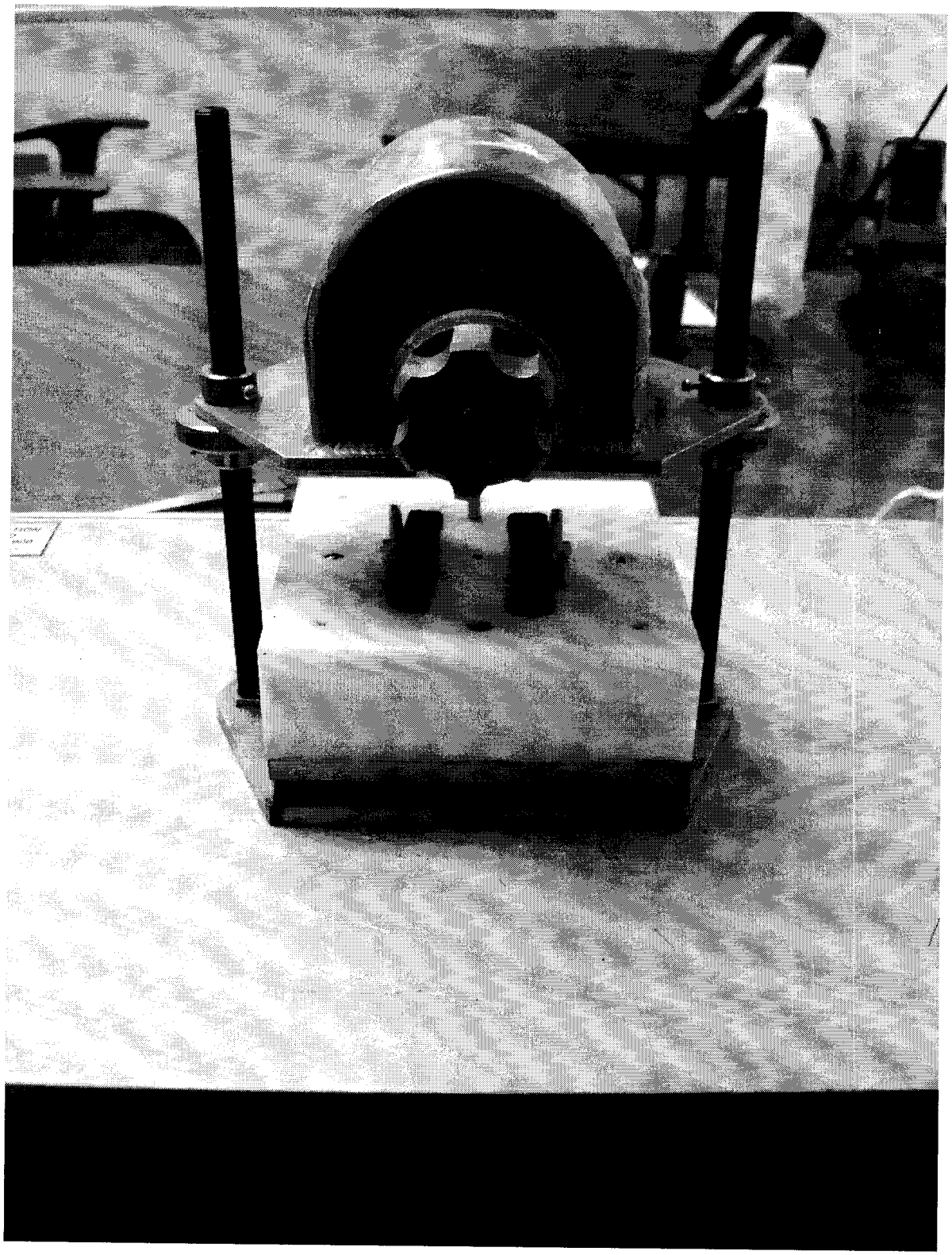









Polimaster Test Fixture OM6-072 00.000, Stand # 1
1 Micro Curie, Cs-137 Capsule A3015 Sealed
Fixture will be bolted to workbench to prevent removal.



PROGRAMMABLE DOSIMETER
PM1203M

OPERATING MANUAL

CONTENTS

This Operating Manual combined with the passport is intended to describe the design, operation and use of the programmable dosimeter PM1203M. The Operating Manual includes the general description, specifications of the dosimeter, instructions for its maintenance, as well as some other information necessary for the proper operation of the dosimeter and a full realization of its possibilities.

During manufacturing of the programmable dosimeter PM1203M some changes may be introduced in its electrical scheme, construction and software that do not influence the specifications and metrological parameters and, therefore, may be not specified in this manual.

1. DESCRIPTION AND OPERATION OF THE DOSIMETER

1.1 Application of the dosimeter

The PM1203M programmable dosimeter (hereinafter referred to as the device) is designed to provide:
- continuous measurement of the ambient dose equivalent rate of gamma radiation $\dot{H}^*(10)$ (hereinafter DER);
- measurement of the ambient dose equivalent of gamma radiation H*(10) (hereinafter DE);
- measurement of the time of the ambient dose equivalent accumulation;
- storage in the memory and transmission to a personal computer of the DER measurement history;
- indication of the time in hours, minutes and seconds, the date and month and year on the digital liquid crystal display.

The PM1203M programmable dosimeter may be used by a variety of specialists (personnel of nuclear facilities, radiological and isotope laboratories, officers of the emergency services, civil defense, fire brigades, police, customs and border services), as well as by a wide range of users to measure the DER and DE of gamma radiation.

1.2 Delivery kit

Table 1.

Item	Type	Quantity	Note
Programmable dosimeter PM1203M	14804920.006-2001	1	
Battery	V357	2	Used within the temperature range of minus 15 – plus 50°C
	CR13N	1	Used within the temperature range of minus 40 – plus 60°C
Protective screen	741311.086	1	Available as an option
Operating manual	412118.006	1	
IR adapter IR Computer Link ACT-IR220L	426434.008	1	Available as an option
Case for shipping	412915.002	1	

1.3 SPECIFICATIONS

1.DER measurement range	0.1 – 2000 μSv/h
2.DER threshold range	0.1 – 1999.99 μSv/h, step is 0.01μSv/h
3. Maximum permissible intrinsic relative error of DER measurement	$\pm(15 + 1.5/\dot{H} + 0.0025\dot{H})\%$, where $\dot{H}$ - the measured DER, μSv/h
4. DE measurement range	0.01 - 9999 mSv
5. DE threshold range	0.01 – 9999.999 mSv, step is 0.001 mSv
6. Maximum permissible intrinsic relative error of DE measurement	±20 %
7.Coefficient of variation	10 %
8. Range of the dose accumulation time	1 – 9999 h, step is 1 h
9.Maximum permissible additional relative error of measurement:	
- due to temperature variations from normal to high or low	± 15 %
- at limiting values of power voltage	± 10 %
- due to humidity variations from normal to high	± 10 %
10.Energy range	0.06 - 1.5 MeV
11.Energy response relative to 0.662 MeV (^{137}Cs) in the energy range:	
0.06 - 0.662 MeV	± 25 %
0.662 - 1.5 MeV	± 15 %
12. DER measurement time, no more than	36 s
13.Response time when DER value is increased more than 10 times, no more than	10 s
14. Instability of readings during 24 hour continuous work, no more than	± 5 %
15. Search mode is available	
16. DER measurement start is available	
17. Electronic watch accuracy at normal conditions may be set using digital correction at	±1 s/24 hours
18. Power supply	3 V (two V357 type batteries or one CR13N type battery)

19. Battery discharge warning: the 1st level: indication of partial battery discharge;
the 2nd level: indication of critical battery discharge

20. Battery lifetime at natural background and audible signals activated for more than 2 min/24 hours, at least: 1 year

21. PC communication by infrared interface at a distance: up to 0.2 m

22. Angular response of the device for each energy does not exceed values (in %) presented in Table 2, when the device is rotated in the horizontal plane and values (in %) presented in Table 3 when the device is rotated in the vertical plane

Table 2

Angle of detection relative to the direction of graduation, °	Angular response, %		
	Energy of gamma radiation, MeV		
	0,059	0,662	1,25
0	0	0	0
30	±5	±15	±10
60	±5	±5	±10
90	±5	±5	±10
120	±15	±5	±10
150	±15	±15	±10
180	-30	±10	±10
-30	-30	±15	±15
-60	-75	±10	±10
-90	-65	±10	±10
-120	-35	±10	±10
-150	-30	±15	±10

Table 3

Angle of detection relative to the direction of graduation, °	Angular response, %		
	Energy of gamma radiation, MeV		
	0,059	0,662	1,25
0	0	0	0
30	-20	±15	±15
60	-50	±15	±15
90	-35	-50	-35
120	-65	±15	±15
150	-30	±15	±15
180	±15	±15	±15
-30	-20	±15	±15
-60	±65	±15	±15
-90	-95	-55	±15
-120	-70	±15	±15
-150	-15	±15	±15

23. Operating conditions:	
- temperature range	from –15 ° to +50 °C
- relative humidity	up to 80% at + 35 °C
- pressure	66 - 106.7 kPa (495 – 800 mm Hg)
24. Dimensions:	
- PM1203M	125x42x24 mm
- PM1203M with the protective screen	125x47x25 mm
- PM1203M in the case	180x135x71 mm
25. Weight:	
- PM1203M	0.09 kg
- PM1203M with the protective screen	0.17 kg
- PM1203M in the case 412915.002	0.34 kg
- PM1203M with the protective screen in the case	0.42 kg
26. Reliability parameters:	
average full operating time, no less than	10000 h
average service life, no less than	6 years
average time of recovery, no more than	60 min

1.4 Design and theory of operation

1.4.1 Design of the device

The device is designed as a monoblock housed in a plastic case. The device uses a Geiger-Muller tube as a radiation detector, which converts gamma radiation quanta to electric pulses that are processed by the microprocessor.

A direction of graduation and the detector geometric center relative to which the factory calibration is performed are shown in Figs. 1a and 1b.

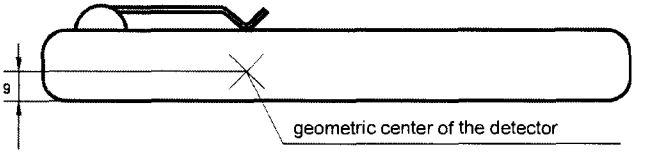


Fig.1 a.

The total surface density of the walls enclosing the detector is 1 g/cm^2 when the protective screen is used. This provides the detector protection from the background beta radiation. The microprocessor controls as well over the display, power supply and electronic watch.

The time of reading stabilization is set automatically in inverse dependence on the dose rate level. A dependence of the time of reading stabilization on the DER value is presented in the Table A.1 of the Attachment A.

The device allows setting thresholds of the dose equivalent rate (DER) and dose equivalent (DE) values. An excess of the preset thresholds may be controlled visually (from the display readings), or audibly. The DER and DE measurements are carried out continuously and are independent on a value indicated at the moment on the display.

The following controls are located at the front panel of the device (Fig. 1b).

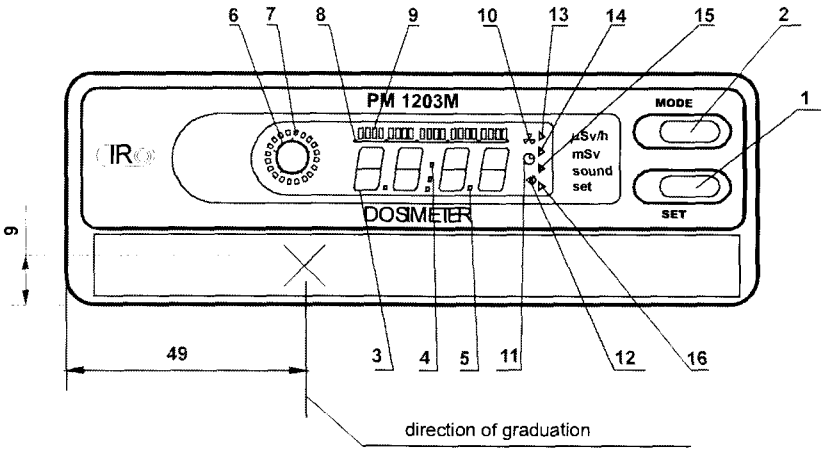


Fig. 1b

1 - the "**set**" button is used to enter the *reference mode* or to exit from it (to check the alarmclock ON time; date and month, year, minutes and seconds), to enter the *set mode* and exit from it, as well as to enter the *data storage mode*, *DER measurement start mode*, *data transmission mode* and to exit from these modes.
2 - the "**mode**" button is used to switch between DER, or DE, or Current Time modes, to set the dose rate audible indication ON/OFF, to change the parameters as well as to start measurements in the DER mode and to store the DER values.

The "**set**" and "**mode**" buttons are used in two ways: pressing (for approx. 1 second) and releasing, or pressing and holding (for approx. 3 or more seconds).

The display has the following indication elements:
3 - digital panel;
4 - dividing sign ":" (colon);
5 - dividing sign "." (point);
6 - circular element;
7 - circular analogue scale of DE values;
8 - linear element;
9 - linear analogue scale of DER values;
10 –"dosimeter" sign indicating that the device operates in the *dosimeter mode*;
11 - "Current Time mode" sign ("clock" sign);
12 - "Alarmclock ON" sign indicating that the alarmclock will sound at the preset time;
13 - "DER mode" sign;
14 - "DE mode" sign;
15 - "Sound ON" sign showing that the dose rate audible indication is set ON;
16 - "Set mode" sign.

1.4.2 Operation modes

The main operation modes are as follows:

- DER mode;
- DE mode;
- current time mode.

The auxiliary modes of operation are as follows:
- DER measurement start mode;
- DER value storage mode;
- audible DER indication mode;
- data transmission mode;
- alarmclock and calendar reference mode;
- set mode;
- mode of digital adjustment of electronic watch accuracy;
- the mode of indication of the partial and critical battery discharge;
- the mode of indication of the device failure.

2 USE OF THE DOSIMETER

2.1 General guidelines

When purchasing the device it is necessary to check the safety of seals, the delivery kit and the proper operation of the device in all the operation modes.

Protect the device from mechanical damages, shocks. Avoid exposing the device to strong chemicals, organic solvents and open fire.

2.2 Safety instructions

During the device adjustment, checking, repair, maintenance and verification, if the radioactive sources are used, the regulations for work with radioactive materials and other radiation sources, as well as Standards of radiation safety should be followed.

When the device is used within a territory contaminated by radioactive materials, it is recommended to put it in a polyethylene bag to prevent its radioactive contamination.

2.3 Preparation for use

It is necessary to study the present manual before using the device. The device is supplied with the inserted batteries and is ready to operate after it is unpacked.

2.3.1 Checking the device operation

Checking the device operation is performed with the control buttons. To check the device operation it is necessary to perform the operations described in points 2.4.1 – 2.4.7. When the device operates in the DER mode, the LCD should show the natural background value. If the device is operative, the LCD should not display the error messages **Er01 – Er04** (Table 4). If the battery voltage is normal, the LCD should not show the message "**bAt**".

Attention ! ***If the device seems to be used under conditions when the DER value is higher than 100 μSv/h, it is recommended to insert new batteries.***

2.4 Use of the dosimeter

The device operates continuously in the **measurement mode** and carries out the 24 hour measurements of the DER, DE, DE accumulation time and indicates the current time on the electronic watch. The DE and DER values are indicated in digital format and also in analogue format - on the corresponding analogue scales that appear on the display, if the DE and DER values exceed 0.1 of the preset thresholds. When the DE and DER values exceed the thresholds, the corresponding scales are completely displayed. The closeness of the DE and DER current values to their thresholds can be judged from the degree of these scales filling up (Fig. 1b).

2.4.1 Selection of an indicated parameter

The device displays either the measured DE or DER value, or the current time in hours and minutes. Press and release the "**mode**" button to switch between DER, or DE, or Current Time modes. Each pressing of this button changes the values in the sequential order: Current Time - DER - DE - then again Current Time, etc. (see Fig. 2). The corresponding signs appear on the display to inform the user about the indication of either the current time (in hours and minutes), or the DER (in μSv/h) and DE (in mSv) values.

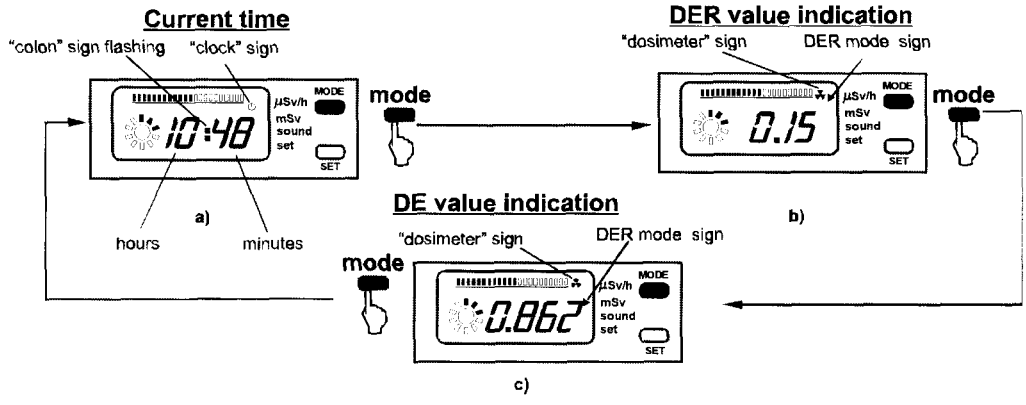


Fig. 2

2.4.2 Dose Rate Audible Indication

Press and hold the "**mode**" button in any of the above mode to set the dose rate audible indication ON; the next value in the order shown in Fig. 2 and the corresponding sign are displayed (Fig. 3). Press the "**mode**" button again to set the sound indication OFF.

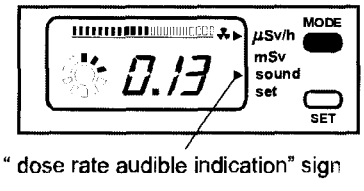


Fig. 3

At natural background, the rate at which the audible tone repeats is 10-20 signals per minute. It will increase with increasing the gamma radiation intensity as a result of, for example, approaching to a radiation source. **This provides a possibility of searching and locating rather intense gamma-radiation sources.**

2.4.3 The mode of indication of the current measured DER value and storage of the DER value

Press and release the "**set**" button (Fig. 4) to switch from the DER value indication to the DER value storage mode. The display will show the number

of an expected reading. To store the current DER value, press the "**mode**" button. The display will show the next number of an expected reading increased by 1. The indication "**rd - -**" means that the memory is full, i.e. 100 readings were stored. To view the stored history it is necessary to use the data transmission mode (see point 2.4.5). The counter of readings may be reset while in the set mode. Then each new reading will be stored in the memory instead of the old one.

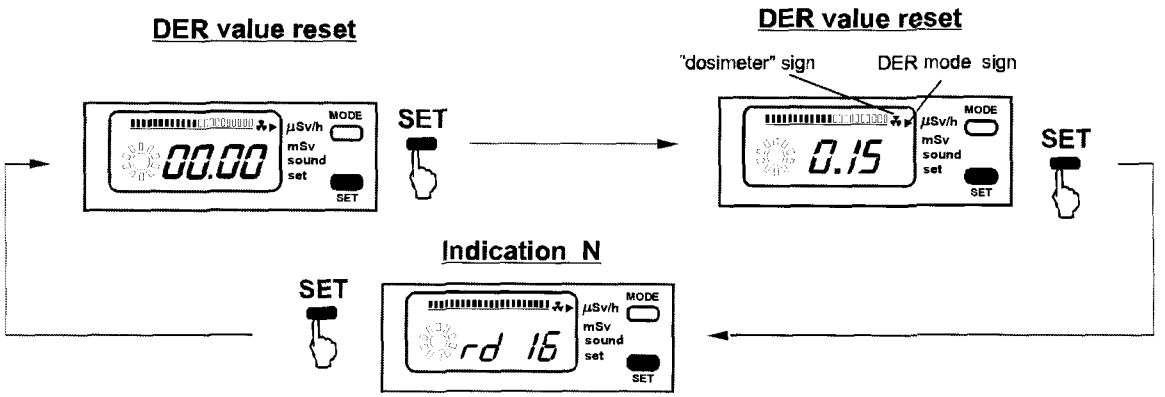


Fig. 4.

2.4.4 The DER measurement start mode

Press two times the "**set**" button to switch from the DER indication to the DER measurement start mode (Fig.4).The LCD will show not flashing digits 00.00μSv/h.

To start the DER measurement press the "**mode**" button. The digits on the LCD will be flashing until the first measured DER value appears. As the device is measuring the DER value, the flashing circular analogue scale is filling in. The flashing circular analogue scale serves to indicate the DER measurement start mode. The empty circular analogue scale corresponds to a statistical error more than 100%, the completely filled in scale corresponds the statistical error no more than 20%. To store the measured DER value, use the "**mode**" button. Press the "**set**" button to exit from the following modes: beginning of the DER measurement, the DER measurement before the analogue scale is completely filled in, or the mode after the measured value was stored.

The device operation in the DER measurement start mode is as follows:

1) switch the device to the state of readiness to starting the DER measurement;
2) place the device to a point where the DER value is to be measured;
3) press the "**mode**" button to start the measurement;

4) when the circular analogue scale is completely filled in, read the DER value or store it in the device memory using the "**mode**" button;
5) press the "**set**" button to exit from the DER measurement start mode.

During the DER measurement it is necessary to take into account that the time of stabilization of the DER readings is automatically changed depending on the DER value. An approximate dependence is given in Appendix A.

2.4.5 The mode of indication of the DE and DE accumulation time and the mode of data transmission to PC

Press and release the "**set**" button to switch from the DE indication mode (Fig.2) to the mode of indication of the time (in hours) during which the DE value was accumulated (see Fig 5). The device will automatically return to the DE indication, if the buttons are left unused for approximately 5 seconds.

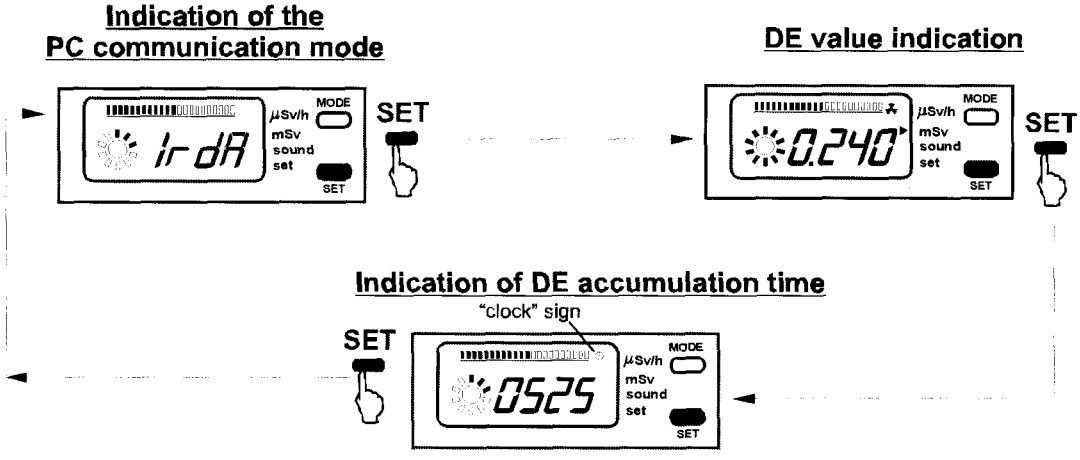


Fig.5.

Attention ! ***When batteries are replaced the values of DE and DE accumulation time are stored in the device memory.***

Knowledge of the DE accumulation time is of great importance, as the human body is not indifferent whether the irradiation was momentary, or continued for a long period of time.

If the "**set**" button is pressed while in the mode of indication of the DE accumulation time, the device enters the PC communication mode and the LCD shows the message "**IrdA**" (Fig.5).

2.4.6 The mode of data transmission to PC

To operate with the device in this mode, an IR adapter (see section 1.2) and an application program PM1203M.EXE supplied on the diskette together with the adapter are to be used.

Minimum requirements to a computer:

- PC 486 or higher;
- 800X600 or higher resolution of a monitor.
- 2 Mb free on the hard disk and an adequate space available for database;
- Windows 9x, NT, ME or 2000.

Connect the cable of the **IR adapter** to a communication port of the personal computer.

To load the application program insert the diskette into the diskette drive. Run the program SETUP.EXE. Following the instructions given in the program, install PM1203M.EXE into the computer. Run the program PM1203M.EXE. An application window PM1203M will appear on the monitor. Select the communication port, which the IR adapter is connected to, and click "OK". If the port is selected erroneously, the message "Port initialization error" will be displayed. Click "OK" and repeat the operation.

A description of the PC communication mode is given in the help file of the application program.

2.4.7 The mode of indication of the current time, alarmclock and calendar

Switching from the current time indication to the alarmclock and calendar reference mode.

Press and release the "**mode**" button and enter the Current Time mode according to Fig. 2a. Then press the "**set**" button to see sequentially the alarmclock ON time, date and month, year, minutes and seconds in the order shown in Fig. 6.

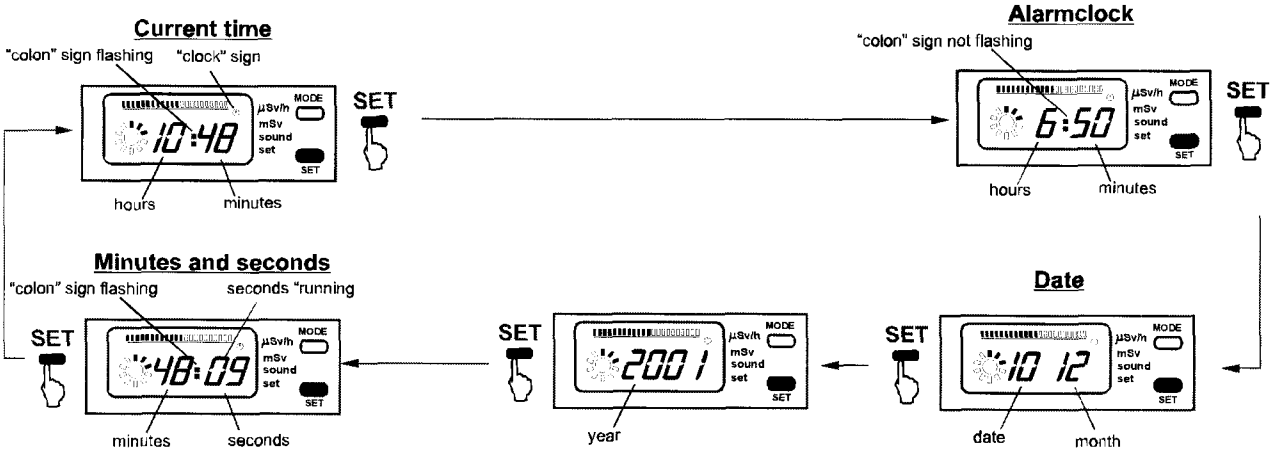


Fig. 6

The display automatically returns to the Current Time mode, if the buttons are left unused for approximately 5 seconds. **Exception**: to exit from the indication of minutes and seconds it is necessary to press and release the "**set**" button again.

To turn the alarmclock ON, press and release the "**mode**" button when the alarmclock ON time is displayed; the corresponding sign will be indicated (Fig. 7) (to turn the alarmclock OFF it is necessary to press and release the "**mode**" button again). The alarmclock signal will sound at the preset time.

Press and release the "**mode**" or "**set**" buttons to stop the sound signal. If the buttons were not pressed, the signal will sound for 60 seconds.

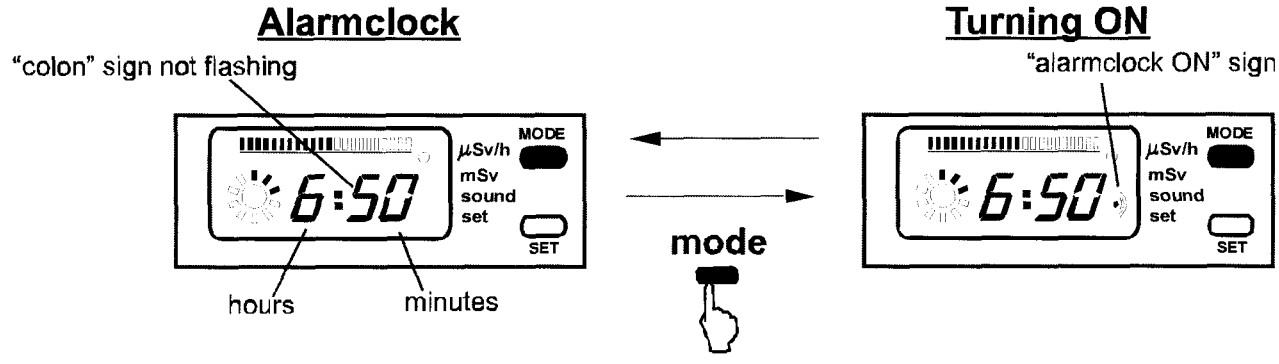


Fig. 7

2.4.8 Set mode

The *set mode* allows setting the hours, minutes, seconds, date, month, year, alarmclock ON time, DER and DE thresholds, and resetting the counter of readings. Press and hold the "**set**" button to enter this mode. To exit from this mode press and hold this button again, or the device will automatically exit from this mode, if the buttons are left unused for approximately 1 minute. Press and release the "**mode**" button to change the set parameters.

2.4.8.1 Setting the alarmclock ON time, date, month, year and current time

Press and release the "**mode**" button to enter the Current Time mode according to Fig. 2. Press and hold the "**set**" button, the set mode sign will appear and the hours will be flashing on the display. (Fig. 8).

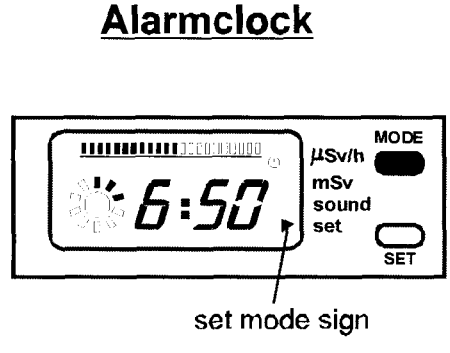


Fig. 8

Press and release the "**mode**" button to correct the flashing digit by one. For setting the minutes, press and release the "**set**" button. The minutes will be flashing. Each pressing of the "**mode**" button increases the flashing digit by one. Hold this button down to change the minutes rapidly.

Each pressing of the "**set**" button switches between the set parameters in the rotation shown in Fig. 9 (press and release the "**mode**" button to correct the flashing digits).

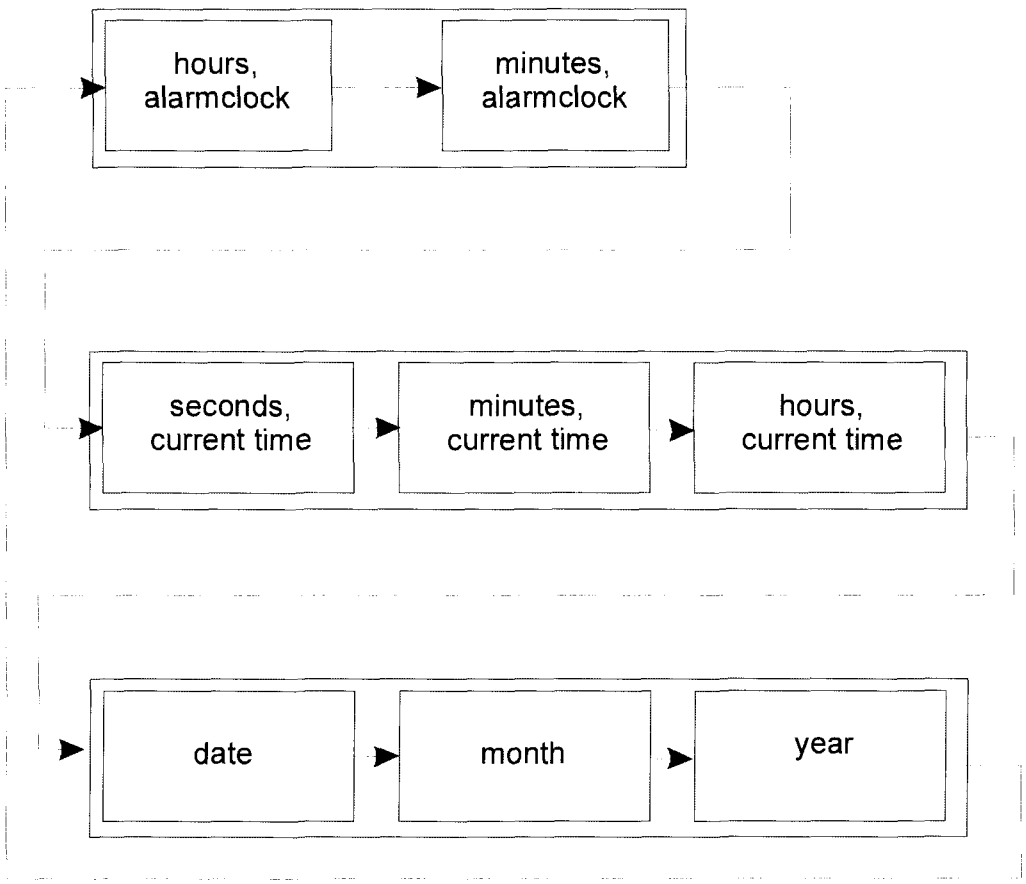


Fig. 9

The device will automatically ***exit from the set mode***, if the buttons are left unused for approximately 1 minute, or the user may press and hold the "**set**" button to exit.

2.4.8.2 Setting the DER threshold

The device informs the user about an excess of the preset DER threshold by an audible signal and enters the DER mode, the LCD indicating the completely filled in linear analogue scale. The audible signal will sound until the DER becomes lower than the preset threshold. To stop this signal, press

and release the "**set**" or "**mode**" button. If the DER value will subsequently become lower than the preset threshold and then will exceed it, the audible signal will sound again. When the upper limit of the DER measurement of 2000 μSv/h is exceeded, the LCD will indicate the flashing message "**-HI-** ".

ATTENTION! ***When the batteries are replaced, the DER threshold is not changed. The user may set it at his own discretion taking into account the relevant Standards or recommendations.***

To set DER threshold, press and release the "**mode**" button and enter the DER mode according to Fig. 2. Press and hold the "**set**" button to see the preset DER threshold; the two least significant digits (tenths and hundredths of μSv/h) will be flashing, the set mode sign will appear and the filled in linear analogue scale will be indicated (Fig. 10).

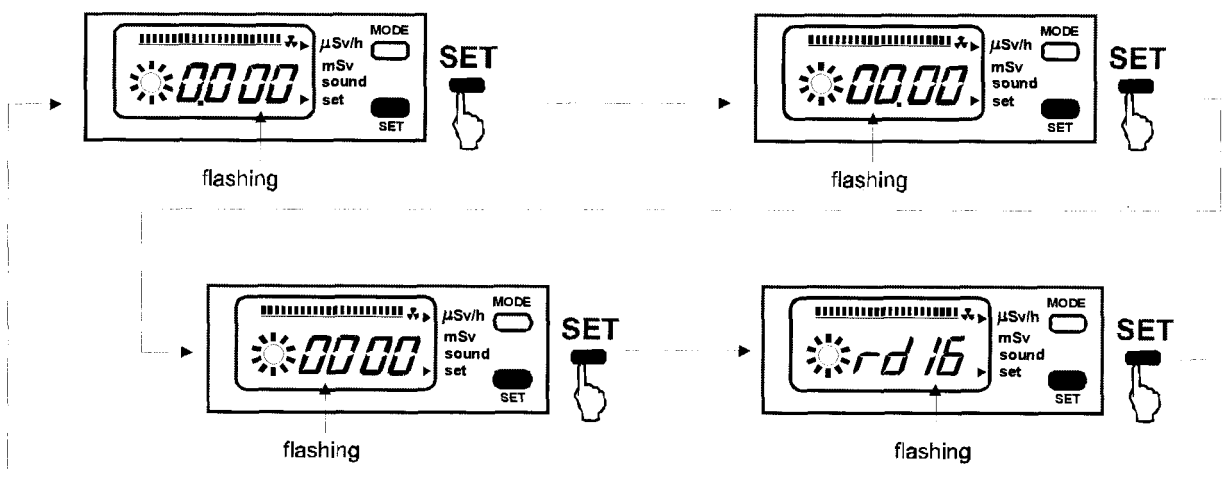


Fig. 10

Press and release the "**mode**" button to change the value by one.

Press and release the "**set**" button again to make flashing the first two digits on the display (units and tens of μSv/h). Press and release the "**mode**" button to change these digits. The next pressing of the "**set**" button makes flashing the last two digits on the display (hundreds and thousands of μSv/h), which may be changed by pressing the "**mode**" button. After the next pressing of the "**set**" button the device will enter the state when the counter of reading may be reset. This may be done by pressing the "**mode**" button. Press the "**mode**" button again to cancel the reset of the counter. The device will automatically exit from this mode, if the buttons are left unused for approximately 1 minute, or the user may press and hold the "**set**" button to exit.

2.4.8.3 Setting the DE threshold

WARNING! ***When viewing or setting the DE threshold, please remember that the DE threshold changing causes the reset of the accumulated DE value and DE accumulation time.***

The user may set the DE threshold at his own discretion taking into account the relevant Standards or recommendations.

The device informs the user about an excess of the preset DE threshold by an audible signal and enters the DE mode, the LCD showing the completely filled in circular analogue scale. To stop this signal, press and release the "**set**" or "**mode**" button, the DE measurement will therewith continue.
To set the DE threshold, press and release the "**mode**" button and enter the DE mode according to Fig. 2. Press and hold the "**set**" button to see the preset DE threshold; the two digits (hundredths and thousandths of mSv) will be flashing, the set mode sign will appear and the filled in circular analogue scale will be indicated (Fig. 11).

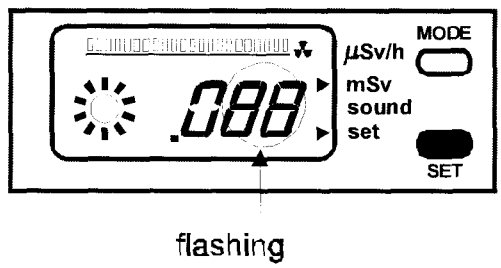


Fig. 11

Every pressing and releasing of the "**mode**" button will change the value by one.

Press and release the "**set**" button again to make flashing the first digit after the decimal point (tenths of mSv). Press and release the "**mode**" button to change this digit. The next pressing of the "**set**" button makes flashing the two digits (units and tens of mSv). After the next pressing of the "**set**" button the first two digits will be flashing (hundreds and thousands of mSv) and may be changed by pressing the "**mode**" button. Press the "**set**" button again to returns to the indication of flashing hundredths and thousandths of mSv. The device will automatically exit from this mode, if the buttons are left unused for approximately 1 minute, or the user may press and hold the "**set**" button to exit.

2.4.9 Digital adjustment of the electronic watch accuracy

Press and release the "**mode**" button and enter the Current Time mode according to Fig. 2. Press several times the "**set**" button to enter the year indication mode. Press and hold the "**set**" button to see two flashing digits and the set mode sign. Press and release the "**mode**" button to set the value that is equal to the weekly deviation (in seconds) of the watch readings from the accurate time. If the watch is fast this value is set with the minus sign. If the watch is slow this value is set without the minus sign. The minus sign is appeared / disappeared when the set value changes from 99 to 00. The device will automatically exit from this mode, if the buttons are left unused for approximately 1 minute, or the user may press and hold the "**set**" button to exit.

2.4.10 Indication of the partial and critical battery discharge

Measurement of the battery voltage is carried out after replacing the batteries and during operation of the device every minute at 00.00.

In the case of the partial battery discharge the LCD will display the message "**bAt**" every 10 seconds and the device will continue its operation.

It is necessary to replace the batteries!

In the case of the critical battery discharge the device discontinues measurements, does not respond to controls and indicates the DE value existing at that moment. In this state the device will save the DE value on the display for no less than 24 hours.

3 MAINTENANCE

Maintenance involves:
- battery replacement in proper time,
- keeping the device clean.

Maintenance is carried out by the user.

The verification of the device is performed by appropriate institutions that are allowed to make these procedures.

ATTENTION ! Insert new batteries before sending the device for verification.

3.1 Battery replacement

Take off the plastic cover at the back panel of the device. Remove old batteries. **After approximately 5 minutes** (this time is necessary for discharging the capacitors) put two new batteries observing the polarity indicated on a label at the back panel of the device, and close the cover. Immediately after inserting the batteries all segments will be displayed and the device will enter the DER indication mode.

ATTENTION! All necessary parameters are stored in the non-volatile memory of the device. Thus the following information is regained after the battery replacement:
- ***the accumulated DE value;***
- ***the DE accumulation time;***
- ***the DE threshold value;***
- ***the DER threshold value;***
- ***the value of the counter of readings and the whole history;***
- ***the date, month, year, hours, tens of minutes;***
- ***a coefficient of accuracy of the watch;***
- ***time of the alarmclock turning ON.***

After the battery replacement the user needs to set the accurate time only to return the device into the initial state. The batteries described in the clause 1.3 should be used. Otherwise the specifications of the device can not be guaranteed.

4 TROUBLESHOOTING

Problem	Cause	Solution
No indications on the LCD	Batteries discharge	Replace the batteries
	Batteries are inserted incorrectly	Insert the batteries in the proper way
	Bad contact between springs and batteries	Clean and tight spring contacts
The device does not respond to pressing a button, the LCD indicates incorrect symbols	Microprocessor error condition	Remove the batteries and insert them again in 5 minutes
The LCD indicates:		
"Er01"	Transducer failure	Send the device for repair
"Er02"	Detector failure	
"Er03"	Registration block failure	
"Er04"	Memory failure	

5 VERIFICATION TECHNIQUE

5.1 Introduction

This technique extends to the programmable dosimeters PM1203M, corresponds to the Methodical Instructions 1788 "Radiation-monitoring devices for measuring the exposure dose and exposure dose rate, absorption dose and absorption dose rate of photon radiation in air. Verification technique" and establishes the verification technique for dosimeters.

The verification should be carried out by local bodies of the metrological department of the State Standard Committee and by institutions authorized to carry out these works.

The verification of a dosimeter should be carried out when releasing for sale, when releasing from repair and during operation and storage with a time interval of 12 months.

5.2 Operations and measuring instruments

The operations that should be performed during the verification procedure and measuring instruments that should be used are listed in Table 5.

Table 5

Operations	Technique section #	Names of reference and auxiliary measuring instruments and major performances
External examination	5.7.1	-
Testing	5.7.2	-
Determination of metrological data	5.7.3	Dosimetric verification assembly according to Methodical Instructions 2050-90. The maximum certified error of the assembly should be not higher than ± 5% at 0.95 confidence level.
"	5.5	Barometer with the least division of 1kPa. Measurement range from 60 to 120 kPa.
"	5.5	Thermometer with the least division of 0.1° C. Measurement range from 10 to 30°C.
"	5.5	Hygrometer with measurement range from 30 to 90%.
"	5.5	Stopwatch with measurement range from 1 to 600 seconds.
"	5.5	Dosimeter DBG-06T. Intrinsic error is ±15% (Other dosimeters providing the required accuracy of measurements may be used).

5.3 Expertise requirements to officers carrying out the verification tests

Persons certified as State Verification Officers are allowed to carry out verification tests and/or to interpret the results obtained.

5.4 Safety requirements

The following safety requirements should be satisfied when verification tests are carried out by officers:

- works involving the use of radioactive sources should be carried out in conformity to requirements cited in "Major health rules for treating radioactive materials and other sources of ionizing radiation" and "Standards of radiation safety", as well as to instructions for the accident prevention that are in force in the site where verification tests are carried out;

The verification process should be considered as work under special conditions.

5.5 Verification conditions

The following conditions are required for carrying out verification tests:

temperature of the environment, ° C	20±5;
relative air humidity, %	up to 80
atmospheric pressure, kPa (750 ±50 mm Hg).	100±4;

5.6 Preparation for verification tests

Verification officers should study the Operating Manual of the dosimeter before the verification tests.

5.7 Verification procedure

5.7.1 During the external examination the dosimeter should be tested against the following requirements:

- the delivery kit of the tested dosimeter should be the same as described in the manual;
- the initial or last verification should be recorded in the manual;
- the dosimeter should be marked with clear inscriptions;
- pollution and mechanical damages that may influence the work of the dosimeter should be eliminated.

5.7.2 During testing it is necessary:

- to check the operation of the dosimeter as described in sections 2.3.1 of the manual;
- to set the threshold values as follows:
  1) DER threshold value equals to 1999.99 μSv/h;
  2) DE threshold value equals to 9999.999 mSv

5.7.3 The intrinsic relative errors of the DER and DE measurements should be established during the determination of metrological data.

5.7.4 To determine the intrinsic relative error δ of the DER measurements the following operations should be performed:

1) enter the DER mode using the "**mode**" button;

2) place the dosimeter on a dosimetric verification assembly with a ^{137}Cs gamma radiation source; the graduation direction should coincide with the direction of radiation flow and the longitudinal axis of radiation flow should pass through the geometric center of the detector;

3) calculate the average background value. For this purpose in no less than 150 s take 5 readings of H_{bi} at intervals of no less than 30 s and calculate the average background value using an equation:

$$\overline{\dot{H}_{\phi}} = \frac{\sum_{i=1}^{n} \dot{H}_{\phi}}{n},$$

where n is the number of measurements and equals to 5.

4) create DER H_{0j} = 3.0 μSv/h at a point of the geometric center of the detector and irradiate the device;

5) in no less than 120 s after the beginning of irradiation, take 5 readings of H_{ji} at intervals of no less than 30 s and calculate the average value H_j using an equation:

$$\overline{\dot{H}_{j}} = \frac{1}{n} \sum_{i=1}^{n} \overline{\dot{H}_{ji}},$$

where n is the number of measurements at each point and equals to 5.

6) repeat measurements for points where the dose rate value H_{oj} is equal to 30.0; 80.0; 300.0; 1600 μSv/h;

7) calculate for each point the relative error of measurements using an equation:

$$Q_j = \left| \frac{\left(\dot{\overline{H}}_j - \dot{\overline{H}}_\phi \right) - \dot{H}_{oj}}{\dot{H}_{oj}} \right| \times 100\ \%$$

8) calculate the confidential limits of the permissible intrinsic error of the DER measurement (in %) using an equation:

$$\delta = 1.1\sqrt{(Q_o)^2 + (Q_{j\,max})^2},$$

where Q_o-is an error of a standard dosimetric assembly (in %);
Q_{jmax}–is the maximum relative error of measurement (in %),

Compare δ with an acceptable value of δ_{acc} that is calculated using an equation: $\delta_{acc} = \pm(15 + A_1/ H + A_2 \cdot H)$ %,, where A_1 is a coefficient and equals to 1.5 μSv/h, A_2 is a coefficient and equals to 0.0025 $(\mu Sv/h)^{-1}$, H is the measured DER value in μSv/h. If $\delta > |15\ \%|$, the dosimeter is rejected. If $\delta < |15\ \%|$ the dosimeter is considered to be good.

5.7.5 To determine the intrinsic relative error of the DE measurements the following operations should be performed:

1) set the maximum values of the DER and DE thresholds and enter the DE mode, resetting the accumulated DE value;

2) place the dosimeter on a dosimetric verification assembly with a ^{137}Cs gamma radiation source; the graduation direction should coincide with the direction of radiation flow and the longitudinal axis of radiation flow should pass through the geometric center of the detector;

3) read the initial DE value H_{ij} ;

4) create DER H_{0j} = 80.0 μSv/h at a point of the geometric center of the detector and irradiate the device during the time period of 1 hour;

5) read the final DE value H_{ej} after the end of irradiation;

6) calculate the intrinsic relative error of measurement G_j using an equation:

$$G_j = \left| \frac{(H_{kj} - H_{Hj}) - \dot{H}_{oj} \cdot T}{\dot{H}_{oj} \cdot T} \right| \times 100\ \%;$$

7) repeat measurements as described in clauses 3-6 for points where the calculated DER value H_{oj} is equal to 800.0; 1600 μSv/h;

8) calculate the confidential limits of the permissible intrinsic error of DE measurement δ (in %) using an equation:

$$\delta = 1.1\sqrt{(G_o)^2 + (G_{j\,max})^2},$$

where G_o-is an error of a standard dosimetric assembly (in %);
Q_{jmax} –is the maximum relative error of measurement (in %),

Compare δ with an acceptable value of $\pm$ 20 %. If $\delta > |25\ \%|$, the dosimeter is rejected. If $\delta < |20\ \%|$, the dosimeter is considered to be good.

5.8 Presentation of the verification results

5.8.1 The results of verification are entered in the record (a recommended record form is presented in the Attachment B).

5.8.2 With good results of the initial verification, a signature and a verification mark of an officer, as well as a stamp of the institution, in which the verification was carried out and the date of verification are put in section 10 (Acceptance Certificate) of the operating manual.

6 STORAGE AND SHIPPING

6.1 Devices in package are to be stored at the air temperature from -15 °C to +50 °C and humidity up to 95 % at a temperature of 35 °C.

Devices without package are to be stored at the air temperature from 10 °C to +35 °C and humidity up to 80 % at a temperature of 25 °C.

The storage place should be free of dust, vapors of strong chemicals, aggressive gases and other substances that may cause corrosion.

6.2 Devices in package may be shipped by any kinds of closed transport.

When carried by see, devices in package should be placed in hermetic plastic bags with silicagel.

When carried by air, devices in package should be placed in hermetic compartments.

When shipping dosimeters, the environmental conditions should be within the following limits:

- air temperature from -50 °C to +50 °C,
- air relative humidity up to 100 % at temperature of 40 °C.

6.3 Devices in package should be arranged and fastened in the transport so that their stable position is ensured and shocks are avoided.

7 WARRANTY

7.1 The manufacturer guaranties that the device meets the requirements of Technical Conditions provided that the customer will observe the guidelines of its use, shipping and storage described in this manual

7.2 The warranty period of use is 18 months since the date of placing the device in service.

7.3 The warranty period of storage is 6 month since the date of acceptance of the device by the officer of the Quality Control Department of the manufacturer.

7.4 Warranty and after-warranty repair is carried out by the manufacturer or the institutions that have a permission of the manufacturer.

7.5 Warranty does not cover the devices:

- without the manual ;
- those subjected to the customer service;
- with mechanical damages,
- if the requirements of exploitation and storage were not satisfied,
- after expiration of the warranty period stated in p. 7.2.

7.5 The warranty period of use is prolonged for a period of warranty repair.

7.6 Warranty does not cover the batteries. The claims concerning the batteries quality are not accepted. The batteries replacement is not considered as the warranty repair.

8 PACKING CERTIFICATE

The programmable dosimeter PM1203M
type 14804920.006-2001
serial number _____

is packed by JV "POLIMASTER" Ltd.
in accordance with requirements described in design specifications 412118.006.

Packing date _____ 200 ___.

The device is packed by

_____ _____
signature name

Stamp place

9 CERTIFICATE OF PLACING IN SERVICE

The programmable dosimeter PM1203M
type 14804920.006-2001
serial number _____

is placed in service _____
date

"____" _____ _____
signature and name of authorized person

10 ACCEPTANCE CERTIFICATE

The programmable dosimeter PM1203M
type 14804920.006-2001
serial number _____

is manufactured to meet the requirements of the State Standards and the design specifications and is accepted for operation.

Head of Quality Control Department

_____ _____
signature name

" " _____ _____

stamp place

The initial verification was carried out and the device may be used as measuring instrument.

State verification officer

_____ _____
signature name

" " _____ _____

Place of a verification mark

11 WARRANTY CERTIFICATE

The programmable dosimeter PM1203M
type 14804920.006-2001
serial number _____

is manufactured "___" _____ _____.

Manufacturer JV "POLIMASTER" Ltd.

OFFICE
Telephone: (375 17) 217 70 80
Fax: (375 17) 217 70 81
E-mail: polimaster@polimaster.com
Address: 112 M. Bogdanovich str.,
Minsk, 220040, Republic of Belarus

Production Department
Telephone: (375 17) 263 72 00
Tel/Fax: (375 17) 263 81 88

51Staroborisovsky trakt, Minsk,
220141, Republic of Belarus

Date of sale "___" _____ _____

Seller _____
Signature

Seller stamp _____

The warranty (after warranty) repair was made

"___" _____ _____

The warranty period is prolonged till

"___" _____ _____

Manufacturer's officer

_____
signature

Manufacturer's stamp

12 CLAIMS

13 SPECIAL NOTES

Date of verification	Verification officer, Verification mark, Verification institution	Note

Appendix A

Dependence of the time of reading stabilization on the DER value

DER range, μSv/h	Time of reading stabilization (seconds) at a coefficient of variation		
	30 %	20 %	10 %
0.1 - 0.8	150-100	360-300	1000-600
0.8 – 8	100-10	300-30	600-60
8 – 20	10-3	30-5	60-15
>- 20	3	5	15
Note: within the range limits the time is in inverse dependence on the DER value			

Item No. 10
RADIATION SAFETY PROGRAM

1.0 Polimaster Technology Commitment

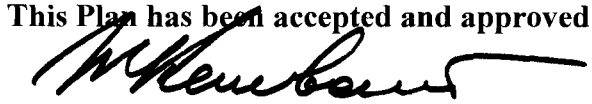
1.1 We, the management of Polimaster Technology, Inc., are committed to the program described herein for keeping individual and collective doses as low as is reasonably achievable (ALARA). As a result of our ALARA program, we hereby describe an administrative organization for radiation safety and have developed the necessary written policy, procedures, and instructions to foster the ALARA concept within our institution. The organization includes a Radiation Safety Committee (RSC) and a Radiation Safety Officer (RSO).

1.2 Polimaster Technology Inc. will perform a formal annual review of the radiation safety program, including ALARA considerations. This will include reviews of operating procedures and past dose records, inspections, etc., and consultations with the Radiation Safety staff.

1.3 Modifications to operating and maintenance procedures and to equipment and facilities will be made if they will reduce exposures unless the cost, in our judgment, is considered to be unjustified. We will be able to demonstrate, if necessary, that improvements have been sought, that modifications have been considered, and that they have been implemented when reasonable. If modifications have been recommended but not implemented, we will be prepared to describe the reasons for not implementing them.

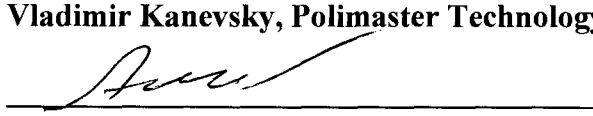
1.4 In addition to maintaining doses to individuals as far below the limits as is reasonably achievable, the sum of the doses received by all exposed individuals will also be maintained at the lowest practicable level. It would not be desirable, for example, to hold the highest doses to individuals to some fraction of the applicable limit if this involved exposing additional people and significantly increasing the sum of radiation doses received by all involved individuals.

This Plan has been accepted and approved by:



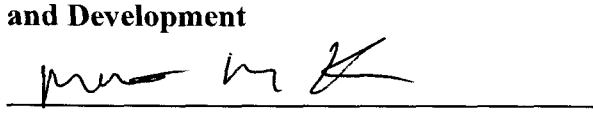
Date 04/16/07

Vladimir Kanevsky, Polimaster Technology, Inc. President



Date 04/16/07

Arif A. Mamedov, PhD, Polimaster Technology, Inc., Vice President for Research and Development



Date 04/16/2007

Matthew M. Kish, Polimaster Technology, Inc, Production Manager and Radiation Safety Officer

2.0 BACKGROUND

Polimaster Technology, Inc uses sealed radioactive sources for the purpose of calibration of our instruments. Each source, whether of exempt quantity or not, is addressed within this document. Since these sources pose unique safety, environmental and regulatory concerns, the purpose of this document is to outline and address those concerns.

3.0 PURPOSE

Polimaster Technology is seeking a radioactive material license, per 10CFR 30.33(a)(1). Instrument and/or Dosimetry Calibration Service Providers: Possession of sealed sources will be used for commercial calibration of radiation survey instruments and/or personnel dosimetry.

All operations involving radioactive material or radiation producing equipment are governed by the following regulations:

- Code of Federal Regulations 10 Parts 19, 20, 30 - 33 & 71 (USNRC)
- Code of Federal Regulations 49 Parts 170 to 178 (USDOT)
- Code of Federal Regulations 29 Part 1910.1096 (OSHA)

4.0 SCOPE

Polimaster Technology, Inc intends to manage the Radiation Safety Program in a manner that ensures the most beneficial and responsible use of radioactive material for the purposes set forth by the license granted by the U.S. Nuclear Regulatory Commission.
The Radiation Safety Program is designed and administered to ensure that all radioactive material is acquired, used, disposed, and accounted for according to all applicable local, state and federal law.

5.0 RESPONSIBILITIES

5.1 *Polimaster Technology, Inc. President is responsible for:*

5.1.1 Ensuring that an adequate Radiation Safety Program is developed, implemented and maintained. Appointing personnel and granting authority to implement policies and programs as needed. Adequately funding the Office of Safety and Environmental Management such that all policies and programs approved by the Radiation Safety Committee can be implemented.
This is accomplished through the delegation of responsibility through the Radiation Safety Committee, the Radiation Safety Officer, individual Authorized Users, and individuals under the supervision of Authorized Users.

5.2 *Polimaster Technology, Inc. Vice President of R&D is responsible for:*
5.2.1 Ensuring Polimaster Technology adopts and implements adequate administrative controls pertaining to the safe acquisition, use and disposition of isotopes and radiation producing equipment. Reviewing, approving, and supporting (where appropriate) the policies and programs recommended by the Radiation Safety Committee. Ensuring administrative support for maintaining the integrity of the policies and programs. Providing assistance and support the Radiation Safety Officer so as to ensure the enforcement of approved policies and programs.

5.3 *Radiation Safety Committee (RSC)*
The Radiation Safety Committee meets every other month and more frequently when necessary. Each member has the right to convene the entire committee. The Committee consists of at least two individuals knowledgeable in radiological issues. At least one member should have experience with radiation producing equipment.
The Radiation Safety Committee is responsible for:
5.3.1 Advising management on all radiological and regulatory issues.
5.3.2 Evaluating and approving or disapproving all applications for radiation producing equipment.
5.3.3 Evaluating the Radiation Safety Program on an annual basis, and forwarding findings to management.
5.3.4 Investigating all instances of unsafe conditions or practices.
5.3.5 Reviewing manufacturing inspection results, and producing corrective recommendations when appropriate.
5.3.6 Investigating all instances of regulatory non-compliance and producing corrective or remedial recommendations when appropriate.
5.3.7 Reviewing the Radiation Safety Officer's bi-monthly reports and forwarding reports (with any corrections, revisions, or recommendations) to the company management.
5.3.8 Evaluating significant radiological issues and developing recommendations.

5.4 *Radiation Safety Officer (RSO)* is responsible for:
5.4.1 Annual review of the written Radiation Safety Program and the implementation status. Anticipates expansion of new regulations and addresses programmatic impacts on respective projects and programs.
5.4.2 Administering Polimaster Technology, Inc. Radiation Safety Program and ensuring that the appropriate regulations are followed.
5.4.3 Radiation Monitoring Program
5.4.4 Personnel Exposure Records
5.4.5 Monthly/Quarterly Notification of Dosimeter Results
5.4.6 Semi-Annual Summary of Exposure Records
5.4.7 Radioactive Waste Management
5.4.8 Surveillance and Inspections

• Annual Inspections of All Radiation Producing Areas - Ensuring that all required semi-annual leak tests are performed and documented.
• Conducting inspections of all non-exempt radiation producing areas.
• Frequent Unannounced Surveys of Specific Radiation Producing Areas
• Audits of Manufacturing Procedures
• Ensuring that calibrations of all radiation meters are conducted and appropriately documented.
5.4.10 Developing, implementing and maintaining a central filing and record keeping system for all surveys, tests and procedures.
5.4.11 Semi-Annual Inventory of:
• Sealed Sources
• Radiation Producing Machines
5.4.12 Radiation Safety Training Program
• Assists in training personnel and others working with or coming into contact with radioactive substances in the course of their employment.
• Training Program Development
• Annual Evaluation and Revision
• Recordkeeping and Retention - Establishes adequate documentation guidelines and procedures to verify training and retains appropriate records.
5.4.13 Developing and coordinating safety programs relating to radioactive materials. Specifies reasonable and adequate safety policies based on RSC input, State and Federal regulations and official regulatory guides.

5.5 *Managers and Supervisors, and Authorized Users*
Authorized users include employees and supervisors who have been formally approved for the use of radiation producing equipment.
The Authorized User assumes ultimate responsibility for radiological safety and regulatory compliance for all areas, materials and individuals under their control or supervision. Failure to maintain adequate safety and regulatory policies, procedures and records will result in suspension of radiation use privileges.
Specific Authorized Users are responsible for:
5.5.1 Regularly inspecting their areas for contamination and maintaining appropriate records.
5.5.2 Ensuring that radioactive materials in their possession are properly secured against unauthorized removal when not in use.
5.5.3 Ensuring that the use of radiation by persons under their supervision is in accordance with NRC and RSC regulations.
5.5.4 Ensuring that all individuals under their supervision (when appropriate) wear personal monitoring devices if recommended by RSC / RSO.
5.5.5 Maintaining an accurate inventory of the identity, quantity and location of all radioactive materials and radiation producing machines in their possession.
5.5.6 Correcting violations which occur in areas or among individuals subject to the Authorized User's control.
Note: **Failure to correct violations or repeat violations may lead to suspension or revocation of radiation use privileges.**

5.5.7 Training all persons using radiation under his/her authorization to follow the safety procedures and regulations listed in this document and maintaining appropriate records.
5.5.8 Using only those isotopes (and quantities), sources and radiation producing equipment approved by the RSC.
5.5.9 Performing or causing to be performed routine contamination surveys and maintaining appropriate records.
5.5.10 Ensuring that all personnel are registered with the RSO prior to working with radiation.
5.5.11 Notifying the RSO when planning to use new space for radioactive work or when manufacturing space is no longer used for radioactive work.
5.5.12 Providing suitable radiation detection instruments. These detectors must be calibrated and must be in good working order.
5.5.13 Providing adequate shielding and other personal protective equipment.

6.0 RADIATION SAFETY, GENERAL CONSIDERATIONS

As radiation is not visible, a number of different but related approaches must be taken to ensure human health and protection of the environment. These approaches are described below, and in more detail in subsequent sections. These procedures apply to all individuals, departments, and locations at Polimaster Technology, Inc.

6.1 *Authorized Users - Conditions for Licensing and Registration*

Individuals wishing to be approved for the acquisition and use of non-exempt radioactive material must apply to the Radiation Safety Committee.
The applicant must directly supervise the project involving radioactivity, and is responsible for its safe conduct within the parameters set by the authorizing application, the requirements of this manual and regulations 10 CFR Parts 20, 30-33.
Any Authorized User found to be willfully or negligently violating company, NRC or State regulation governing the use of radioactivity may have his/her approval revoked or suspended. The RSO has the authority to immediately stop any operation posing an immediate threat to human health or the environment. The RSC has adopted the following guidelines for addressing problems that may arise in radiation areas:
• The RSO investigates and reports findings to the RSC.
• The RSC investigates further and forwards recommendations to management.
• The Management takes the action necessary to correct the problem and reports such action to the RSC.
6.1.1 Temporary Non-Use or Inactive Status of Authorized Users
A duly Authorized User may choose to temporarily transition into a "Non-Use or Inactive" status during anticipated periods when no radioactive material will be received, possessed, used, transported, or disposed (suggested minimum, 6 months). During "Non-Use or Inactive" status the following radiation safety requirements will be suspended:
Refresher Training

Dosimeter Receipt & Exchange
Inspection Questionnaire Responses
SurveyMeter Calibration
An Authorized User may change to "Non-Use or Inactive" status simply by notifying the Radiation Safety Officer (RSO).
Returning to "Active" status can be accomplished within 1-2 days by:
Notifying the RSO
Completing Refresher Training
Receiving Dosimeters, As Required
Receiving Survey Equipment
Authorized Users that do not receive, possess, use, transport, or dispose of radioactive material for periods exceeding 12 months will automatically be placed in temporary "Non-Use or Inactive" status.

6.2 *Engineering Controls - First Line of Defense and Recommended Course of Action*

Engineering controls include shielding, fume hoods, interlocks, etc. Do not perform any radiological task with inadequate or malfunctioning engineering controls. Even with proper shielding, any effective dose can be diminished by minimizing the time of exposure.

6.3 *Administrative Controls - Second Line of Defense and Recommended Course of Action*

Administrative controls include policies such as material security, the prohibition of eating, drinking or smoking in restricted areas, training and experience requirements, audits and periodic review.
6.3.1 Security of Radioactive Material
• All radioactive material **MUST** be secured from unauthorized use, removal and vandalism at all times.
• Unsecured radioactive materials must **NEVER** be stored or used in an unrestricted and un-posted area. Unsecured material **MUST** never be left unattended.
• Restrict radioactive material access from anyone not authorized to use those materials.
6.3.2 Caution Signs and Labels
Every location storing or handling radioactivity or radiation producing equipment will be posted with appropriate signage per 10 CFR Parts 19.11 & 20.1901-1905.
Radioactive Material Areas
• Each area will be posted with the "Notice to Workers"
• Each container of radioactive material will be clearly labeled with the conventional radiation symbol, the words "Caution Radioactive Material", the identity and activity of the isotope, and the date labeled.
• Each restricted area shall be labeled as such, including the words "Caution Radioactive Material: NO eating, drinking or smoking.

• All radiation work areas in restricted areas will be clearly defined. All work in these areas requires the use of personal protective equipment, dosimeters (when deemed appropriate by RSO), etc.
• All radioactive material storage areas (cabinets, etc.), must be labeled as such: "Caution Radioactive Materials".

Radiation Producing Machines
All radiation producing machines and areas must be secured against unauthorized use and properly posted. Contact the RSO for signs and labels.
6.3.1 Employee Notification
Each radiation area will be posted with a "Notice to Employees" bulletin as required by the RSO.
6.3.2 Eating and Drinking Policy
Eating, drinking and smoking are not allowed in restricted areas. Application of cosmetics is also not allowed in restricted areas. Evidence of eating, drinking, smoking, or cosmetics is not allowed in restricted areas. Failure to abide by this policy may result in suspension or termination of isotope privileges. Coffee cups, soda cans, food wrappers in a trash can, all constitute evidence of infraction. Gum chewing, using cough drops or placing one's pen in their mouth are examples of infraction.
6.3.3 Training and Education
All aspects of the Radiation Safety Program must be understood and diligently followed by all radiation workers. This education must include not only this manual, but the biological effect of radiation, general radiation principles, engineering controls, personal protective equipment, monitoring & surveillance, specific experimental procedures, record keeping, disposal methods, and general regulatory information. This education is accomplished by scheduled training sessions by the RSO, Basic Radiation Training DVD, and reading printed material. Training and instruction is an annual requirement for continued radiological work.

6.4 Radiation Monitoring Instruments
6.4.1 Radiation Monitoring Equipment Selection
The RSC or RSO, as appropriate, will review and approve radiation monitoring instrumentation to assure that it will be appropriate during licensed activities. The RSC may decide in its review of technology or appropriate instrument calibration that selection criteria or calibration practices require adjustment based on accepted health physics practices or standards. "We reserve the right to upgrade our survey instruments as necessary"

6.4.2 Equipment Calibration
Survey instruments used to determine compliance with regulatory requirements will be calibrated periodically by the instrument manufacturer or persons specifically authorized by NRC or an Agreement State. Survey instruments will

be calibrated at least annually (every 12 months), unless otherwise specified by regulation or license condition.

6.5 Radiation Area Surveillance

Regular surveys for radioactive contamination are an essential element of the Radiation Safety Program. Contamination can be present on (or in) instruments, on floors, bench tops, door knobs and ventilating systems. Such contamination must be located, identified, quantified and remedied. These procedures are necessary to limit both internal and external dose.

For the purpose of this section, the term "surveillance" means the observation of radiological conditions in restricted areas by the person who performs the routine radiation and contamination surveys. This surveillance is one of the more important aspects of any radiation safety program. Through organized, periodic and scheduled surveillance personnel acquire the detailed knowledge necessary to:

1) identify ways of preventing or minimizing occupational exposure; 2) select appropriate times for performing radiation safety measurements; and, 3) to adequately prepare for emergency conditions. The surveillance program should include the following:

• Regular inventory of radioactive material, including identity, location and disposition
• Frequent audits of radiation safety procedures
• Comparison of the amount of material in use with possession limits
• Discussion with personnel to ensure continued awareness of safety procedures and adequacy of training and instruction
• Evaluation of the adequacy of existing engineering controls
• Evaluation of spill or incident response equipment and materials
• Evaluation of procedural changes.

Monitoring and surveillance mean actual tests for the presence of radiation in an area, dosimetry and continually evaluating the operation of the Radiation Safety Program as a whole. These activities take the form of wipe tests, surveys, dosimetry devices, inspections, audits and periodic review. Monitoring and surveillance methods and schedules are detailed in subsection 6.5.1-6.5.3

6.5.1 Survey Schedules

Each Radiation Area must perform and record contamination surveys every 6 months when isotopes are in use. When isotopes are not in use for a period of six months or longer, surveys need not be performed. However, the statement "No isotopes in use (date)," must be entered in the survey log book. Although survey records must be retained by the Authorized User for three years, the RSC recommends permanent retention.

6.5.2 Survey Areas

Equipment Survey

Prior to the transfer of potentially contaminated equipment or instruments from a restricted to unrestricted areas, surface contamination surveys must be conducted, and records maintained. The Authorized User is responsible for performing, or causing such surveys to be performed, and maintaining accurate

records. Some examples include the transfer of a calibration fixture from the Radiation Area into a storage area.

Sealed Sources

Non-exempt sealed sources shall be wipe tested by the RSO. Sensitivity of the assays will be such that activities equal to 5 nanocuries can be detected. Activities greater than 5 nanocuries will result in the decontamination and repair of the source. A report of such contamination will be sent within 5 days to the RSC. The RSO shall develop and maintain a complete inventory of all nonexempt sealed sources.

- For non-exempt, beta or photon emitting sealed sources, six-month wipe (leak) tests are required.
- For non-exempt, alpha emitting sealed sources, 3 month wipe (leak) tests are required.

6.5.3 Survey methods, Procedures and Audits

The RSO will (periodically) perform random confirmatory contamination surveys during scheduled and unscheduled inspections.

In addition, wipe-test records must include the following information:

1) Contamination levels in DPM (requires instrument calibration),
2) Make and model number of the survey instrument,
3) Sample and background counts,
4) Signature and date.

Sealed sources shall be wipe tested in the following manner: Each source will be wiped over the source or the closest accessible surface, according to manufacturer instructions or guidance from RSO / RSC.

6.5.4 Special Monitoring Requirements/Bioassays

At present, bioassay is not a requirement of our license.

6.5.5 Work Site Surveys

Whenever a survey or wipe test indicates contamination levels greater than 50 DPM(above the blank) on surfaces or equipment, decontamination action shall be initiated. The original contamination and final resolution shall be entered in the survey logbook. Decontamination efforts shall be referred to the RSO.

Ingestion

The Radiation Safety Program addresses the issue of internal dose by including firm policy and procedural language designed to eliminate any opportunity for isotope ingestion.

Polimaster Technology, Inc. does not allow and will not tolerate the following behavior:

- Eating, drinking or smoking in a restricted area.
- Storing food or drink in restricted area(s).
- Applying cosmetics in restricted area(s).

Reallocated Equipment

Reallocated equipment must be decontaminated prior to removal from the restricted area.

6.6 *Personal Monitoring*

Polimaster Technology, Inc. has implemented a personal dosimeter program for staff and visitors to monitor and record occupational exposure to radiation from

licensed and unlicensed radiation sources for those likely to receive a dose in excess of 10 percent of the applicable level, as listed below, and individuals entering a high or very high radiation areas.

Occupational Dose Limits

Adults likely to receive, in 1 year from sources external to the body, a total effective dose equivalent of 0.05 Sv (5 rem); or the sum of the deep dose equivalent to any individual organ or tissue other than the lens of the eye of 0.5 Sv (50 rem); a lens dose equivalent of 0.15 Sv (15 rem); or a shallow dose equivalent of 0.5 Sv (50 rem) to the skin or to any extremity; and **Minors** likely to receive, in 1 year from sources external to the body, and a total effective dose equivalent of 5 mSv (0.5 rem); or the sum of the deep dose equivalent to any individual organ or tissue other than the lens of the eye of 0.05 Sv (5 rem); a lens dose equivalent of 15 mSv (1.5 rem); or a shallow dose equivalent of 0.05 Sv (5 rem) to the skin or to any extremity; and **Declared pregnant women** – The licensee or registrant shall ensure that the dose to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed 5 mSv (0.5 rem).

6.6.1 Identification of Personnel

Likely candidates for personal dosimetry include all individuals working with high energy beta, neutrons, and all gamma producing equipment.

Infrequent radiation users may be supplied with temporary (numerically coded) dosimiters. Only one person may be assigned a given temporary dosimiter per month.

6.6.2 Program Management

The personal dosimetry program is managed by the RSO. Annual Occupational Exposure Records are forwarded to the authorized user for distribution to the individual user. The RSO maintains all records of occupational exposure. The Radiation Safety Program Action Level for the individual exposure is 10 percent (%) of a quarterly applicable limit, as specified above. Action includes a standard investigation report by the RSO. Findings and recommendations will be forwarded to the Authorized User, the exposed individual and the RSC.

Individual exposure records are available from the RSO upon request. All exposure reports will be distributed to individual radiation workers annually, irrespective of recorded effective dose.

6.6.3 Distribution of Devices

Dosimeters are issued monthly or quarterly depending on user needs, and must be returned to the RSO at the end of each measurement period if exposure values are to be meaningful. The RSO collect dosimetry devices, upload data, and return the "reset" dosimeter to the end-user. Authorized Users must make every effort to have dosimeters available for collection on time. This generally means designating a central location where dosimeters are kept.

Dosimeters must be worn at all times when entering the Production Area. When not in use, dosimeters must be stored in an area away from all sources of radiation. Do not take dosimeters home, or out of the workplace.

In addition to quantifying effective occupational dose, dosimeters supply additional benefits:

• Alerting the RSO to equipment malfunction.
• Alerting the RSO to isotope mishandling or inadequate shielding.
• Providing an occupational exposure history for future employment requirements or health issues.
• Providing a convenient method for the RSO to monitor individuals with respect to training.

6.6.4 Disposition of Devices
All dosimeters will be reviewed and uploaded to a secure location with results reported directly to the RSO.

6.6.5 Occupational Dose Records and History
All program participants having prior workplace radiation exposure must assist the RSO in obtaining prior occupational exposure histories.

6.6.6 Access to Dose Records
Dose records will be available to individuals at any time. They will be provided annually to all program participants.

6.6.7 As Low As Reasonably Achievable (ALARA) Program
Polimaster Technology, Inc. requires that all persons working with licensed radioactive materials **must** use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles in order to achieve occupational doses (internal & external) that are ALARA.

6.7 *Maintenance and Renovation Activities in Radiation Areas*

6.7.1 Personnel Notification
Personnel must be notified prior to any maintenance or renovation activity in a restricted area.

6.7.2 Maintenance Personnel Notification
Maintenance personnel must be informed that the maintenance or renovation work will take place in a restricted area.

6.7.3 Janitorial Personnel Notification
Custodians will be instructed with respect to health and safety issues present in restricted areas.

6.7.4 Supervisor Notification
Supervisors will be notified of any maintenance or renovation work taking place in a restricted area.

6.7.5 Clean-up Procedures for Maintenance Activities
Authorized Users are responsible for ensuring that all areas subject to maintenance or renovation are decontaminated to background levels prior to the beginning of such work.

7.0 RADIOACTIVE MATERIAL AND SEALED SOURCE MANAGEMENT

7.1 *General*

These procedures apply to all individuals and departments that receive, possess, use, transport, or dispose of radioactive material.

7.2 *Exemptions*

Some sources of radioactive material are exempt from State and Federal regulation. Examples include self-luminous radium dials, samples taken directly from the environment, and certain defined quantities of sealed and unsealed sources.
Individuals working with exempt substances do not need to be approved by the Radiation Safety Committee (RSC). Exempt users must follow all of the proper health and safety guidelines outlined in this manual, and inventory & dispose (of) all radioactive material accordingly. Exempt quantity radioactive isotopes are included in an annual isotope inventory. Individuals using only exempt quantities of isotope may still be inspected by the Radiation Safety Officer.

7.3 Inventory

The RSO will inventory sealed sources semi-annually Authorized Users must maintain an up to date, accurate inventory of all sealed sources and radioactive material (including identity, activity, and disposition) at all times. Inventory is listed under "Responsibilities: Authorized Users".

7.4 Procurement Procedures for Radioactive Materials and Sealed Sources

7.4.1 Ordering Materials

Only those individuals authorized by the RSC may order radioactive materials. All purchase requisitions must be approved by the RSO. The Authorized User is responsible for ensuring that only those isotopes and quantities allowed to be in his/her possession are ordered. All requisitions must be sent directly to the RSO, irrespective of dollar cost on a Radioactive Material. The following information must be included with each requisition:

- Vendor
- Isotope
- Activity
- Chemical form & state
- User's total possession limit for that isotope
- User's remaining possession limit for that isotope
- Authorized User's signature

7.4.2 Receipt and Opening of Containers

Each incoming package of radioactive material must be logged in when received. The date, isotope, and activity shall be recorded as part of the inventory.
When receiving radioactive shipments, the following procedure must be carried out:

- Appropriate personal protective equipment must be worn.
- Dosimeter, if appropriate, must be worn.
- Measure the exposure rate from a distance of one meter, then at the package surface. If the exposure rate is higher than the values listed below, secure the package and notify the RSO.

Transport Index Exposure Rate mR/h
1 Meter Surface
White I Background <0.5
Yellow II 1 50
Yellow III 10 200

• Remove and open the packing slip. Check this information against the user request form. If the material is not exactly what was ordered, contact the RSO for return instructions. Otherwise,
• Open the outer package, following the vendor's instructions, if provided. Visually inspect the package for damage.
• Open the inner package and verify that the contents agree with the packing slip (isotope, activity, chemical form) and user request form.
• Log the received material in the laboratory's inventory.
• Survey the packing material. If contaminated, handle as radioactive waste. If not, dispose of packing material in normal trash (destroy any radiation symbols first).
• Secure the received material.

7.5 *Inventory*

7.5.1 Radiation Materials Management Areas (RMMA)
The RSO will quarterly tabulate RMMA's. RMMA's are designated as such by the RSO. RMMA's may not be returned to unregulated use without a decommissioning report completed by the RSO.
7.5.2 Sealed Sources
The RSO will inventory sealed sources semi-annually.

7.6 *Storage*

7.6.1 Radioactive Materials Storage and Signage Requirements
The RSO will determine signage requirements for all locations using or storing radiation or radiation producing equipment.
All rooms in which radioactive materials are used or stored shall be posted "Caution-Radioactive Material".
Radioactive material must be stored in such a manner that exposure to personnel is minimized. Suitable storage precautions shall prevent unauthorized removal or loss. In addition, precautions must be taken to prevent damage due fire, explosion, or flood. Radioactive material must be secured when not in use. All stored radioactive material must be adequately, durably and legibly labeled with respect to isotope, activity, date, and owner.

9.0 RADIOACTIVE WASTE MANAGEMENT

9.1 *Disposal Procedures for Radioactive Materials, Sealed Sources and Radiation Producing Equipment*

9.1.1 Factory Return
All factory returns shall be accomplished by the RSO, who will also retain appropriate documentation.
9.1.2 Waste Minimization
Disposing of radioactive waste is an expensive national problem. Accordingly, the RSC urges all authorized isotope users to make the waste minimization perspective a routine part of all experimental design, execution, and training.
9.1.3 Storage of Waste Products
Shielding

All solid waste must be stored in such a manner that the exposure at the waste container (or shield) is less than 0.5 mR/h. If these values cannot be achieved, additional shielding or an accelerated waste pick-up schedule is required.

10.0 TRAINING AND EDUCATION

The radiation instruction program consists of several complementary parts, geared toward different occupational needs and backgrounds. Included are this manual, topical RSO updates, an initial training series provided by the RSO, requirements for annual refreshers, training for ancillary personnel, and RSO meetings with individuals and working groups.
Required Training
Authorized Users: Initial instruction in radiation safety, which includes content from this manual along with annual refresher training is required and is provided by the RSO.
Ancillary Personnel: Annual instruction provided by the RSO.

10.1 *Initial Employee Training*

All individuals working with ionizing radiation must attend an initial training session with the RSO.

10.2 *Annual Employee Training*

All individuals working with ionizing radiation must complete annual refresher training.

10.3 *Training Schedule*

Initial employee training is scheduled at the beginning of employment. Special arrangements can be made by contacting the RSO. Annual training is accomplished by users reading refresher training material, which can be accessed from RSO.

10.4 *Training Contents*

Instruction content is outlined below by user category:
Radiation Workers
a. Introduction to radioactivity
b. Interaction of radiant energy with matter
c. Radiation type, units, and calculations
d. Biological effect of radiation
e. Radiation safety principles
f. Engineering controls, personal protective equipment
g. Dosimetry
h. Surveillance, monitoring, and records
i. Regulatory issues & security
j. Individual responsibility
k. RSO responsibility
l. Waste Disposal
m. S.O.P's

n. ALARA
o. Personal Protective Equipment
p. Emergencies

Ancillary Personnel
a. Radiation, general issues
b. Radiation, specific types and locations
c. Warning signs and notification
d. Procedures for working in restricted areas
e. Individual responsibility
f. RSO responsibility
g. Emergencies

Emergency Responders
a. Introduction to radioactivity
b. Radiation type and characteristics
c. Biological effects of radiation
d. Radiation safety principles
e. Type, quantity, and location of all Polimaster Technology sources
f. Fire in a restricted area
g. Dosimetry and decontamination
h. External dose, internal dose
i. Radiation incident preparedness

11.0 EMERGENCY RESPONSE ACTIVITIES

11.1 *Radiation Emergencies*

11.1.1 Notification to RSO

In the event of a major incident (11.1.2, below) Radiation worker should contact Fire, Police, and Rescue Services (911). In the event of a minor incident, contact the RSO directly.

11.1.2 Procedures

Major Incidents: Potential Health or Environmental Hazard

In the event of the spread (or suspected spread) of radioactive contamination over a significant portion of a room or larger area, or if the contamination is greater than one millicurie, then:

1. Vacate the area. Leave behind any contaminated (or suspected contaminated) clothing or other articles.
2. If safe to do so, turn off all ventilation systems and close all doors and windows.
3. Keep all people out of the area, except for trained incident response personnel.
4. Call the Police, Fire, and Rescue Services (911). After 911 has been contacted, notify the RSO.
5. Do not attempt decontamination except as directed by the Radiation Safety Officer. Be prepared to describe, locate, and produce needed spill clean-up materials.

Minor Incident: No immediate Health or Environmental Hazard
1. Determine the extent of contamination. If prepared and equipped, the individual should monitor, decontaminate the area, and monitor again. Non-essential individuals should be kept away.
2. If there is any uncertainty about the scope of the contamination, clean-up and disposal methods, monitoring, or record keeping, notify the RSO.
3. Record the incident in writing, and forward a copy to the RSO. This incident report will include the time, date, and location; the individuals, isotope and activities involved; initial and final survey results, and brief narrative describing the events.
Personnel Contamination
In the event that persons are contaminated as a result of a radiation incident, and DO NOT require any other sort of first aid then:
1. Personnel should be decontaminated as quickly as possible using the least drastic means necessary. Decontamination efforts should begin with mild methods (e.g. blotting, copious flushing with water) which should be continued as long as they are effective, and progress to harsher methods only as required. Medical supervision is required when harsh materials or methods are used. Extreme care should be taken to prevent the spread of contamination to any skin or body opening. All liquids generated and materials used during decontamination must be collected and handled as radioactive waste. Personnel performing the decontamination should take all necessary precautions to protect themselves.
2. Immediately notify the RSO and the Police, Fire, and Rescue Services (911). State "Needs radiation decontamination procedures".
In the event that persons are contaminated as a result of radiation incident, and DO require first aid, then:
1. Efforts to save life take precedence over decontamination issues.
2. Immediately notify emergency responders and the RSO. State "Needs emergency medical treatment and radiation decontamination".
Ingestion of Radioactivity
In the event an individual swallows radioactive material, then:
1. Immediately contact the Police, Fire, and Rescue Services (911) and the RSO.
Notifications
Actual or suspected exposures to radiation, including ingestion or inhalation of radioactive materials or contamination of persons or facilities must be reported immediately to the Radiation Safety Officer.

11.2 *Physical Hazard Emergencies*
11.2.1 Radioactive Material Damage under Natural Disasters
Fire
In the event of a fire in a restricted area, pull the fire alarm or call 911. Do not attempt to retrieve radioactive sources from storage or production use. Be prepared to describe the identity, activity, and location of all radioactive sources present in the area.
Floods

All radioactive material shall be stored in such a manner as to minimize any hazard due to floods.

11.3 *Notification Procedures*

In the event of an incident or emergency involving radiation, individuals are to notify the RSO. External emergency responders may be called in by either the RSO, the Shift Manager, or by a member of the senior staff.

11.3.1 Regulatory Notification

Depending on the scope of the problem, the RSO will make the required Agency notifications.

12.0 RECORDKEEPING

Accurate and up to date records are the only means available to demonstrate the safe acquisition, use and disposal of radioactive material. This information is the only way to determine things such as: the location and inspection status of sealed sources. Detailed records retention responsibilities are presented in the following subsections.

12.1 *Personnel and Equipment Monitoring Records*

- The RSO shall maintain records of detection instrument calibration results for three (3) years.
- The RSO shall maintain records of the results of surveys to determine the dose from external sources of radiation in the assessment of individual dose equivalents for as long as Polimaster Technology maintains its license.
- The RSO shall maintain records of the results of measurements and calculations used to determine individual intakes of radioactive material and used in the assessment of internal dose for as long as Polimaster Technology maintains its license.
- The RSO shall maintain records of the results of measurements and calculations used to evaluate the release of radioactive effluents to the environment for as long as Polimaster Technology, Inc. retains its license.
- The RSO shall maintain records of individual's prior occupational dose for as long as the Polimaster Technology, Inc. retains its license.
- Where applicable, the RSO shall maintain records of occupational whole body deep dose equivalent, eye dose equivalent, shallow dose equivalent, and the dose equivalent to the extremities for as long as Polimaster Technology, Inc. maintains its license.
- The RSO shall maintain records sufficient to demonstrate compliance with the dose limit for individual members of the public for as long as Polimaster Technology, Inc. maintains its license.

12.2 *Medical Monitoring Records*

The RSO will maintain all required medical monitoring records.

12.3 *Training Records*

12.3.1 All initial and annual radiation training materials will be maintained for five (5) years by the Radiation Safety Officer at a centralized location.

12.3.2 Records of reviews and updated annual training materials shall replace dated annual training materials as necessary by the Radiation Safety Officer.
12.3.3 Training attendance forms will be maintained for five (5) years by the Radiation Safety Officer.

12.4 *Procurement Records*
Authorized Users shall maintain accurate and current records indicating the identity, activity, location, and disposition of all radioactive materials in their possession. These records shall be available for inspection by the RSO, and summaries shall be sent to the RSO quarterly for the company-wide inventory.

12.5 *Disposal Records*
• The RSO shall maintain records of disposal of licensed or registered material for as long as Polimaster Technology, Inc. maintains its license.
• The RSO shall maintain records related to the decommissioning of the facility for as long as Polimaster Technology, Inc. retains its license.

12.6 *Transportation Records*
The RSO will maintain all required transportation records.

12.7 *Survey and Audit Records*
• The RSO shall maintain records of the provisions of the Radiation Safety Program for as long as Polimaster Technology, Inc. retains its license.
• The RSO shall maintain records of all audits and reviews of Radiation Safety Program content and implementation for three (3) years after the record is made.
• Authorized Users shall maintain all survey and wipe test records for a period of three (3) years.

12.8 *Program Review and Update*
The Radiation Safety Program will be reviewed annually. This review will examine written content, implementation, administrative control, records & documentation, ALARA issues, training requirements and waste management.

Item No. 11
WASTE MANAGEMENT

Item No 11: Waste Management

Polimaster Technology will be using only small quantities of Sealed Sources containing byproduct material. As described in 10CFR Part 20, Subpart K, we will return our sealed sources to the manufacturer for disposal.

5	**RADIOACTIVE MATERIAL** **Sealed Sources and Devices**		
	• Identify each radionuclide that will be used in each sealed source/device.	☑	☐
	• Identify the manufacturer or distributor and model number of each sealed source/device.	☑	☐
	• Confirm that each sealed source/device combination is listed and approved in the SSD registry for the purpose intended.	☑	☐
	• Confirm that the activity per source/maximum activity per device specified in the SSD registration certificate will not be exceeded.	☑	☐

Sealed Sources

Radioisotope	Manufacturer/ Model No.	Quantity	Yes	No
Cf-252, 10.7uCi A3024-1 capsule	CF230240010U	Not to exceed the maximum activity per source/device as specified in the Sealed Source and Device Registration Sheet	☑	☐
Cs-137, 3mCi A3015 capsule	CS730150003M	Not to exceed the maximum activity per source/device as specified in the Sealed Source and Device Registration Sheet	☑	☐
Am-241, 2.7uCi Type D-disk	GF-241-D	Not to exceed the maximum activity per source/device as specified in the Sealed Source and Device Registration Sheet	☑	☐

Source Material

☐ Depleted Uranium	N/A	Kilograms
☐ Uranium-238	N/A	Kilograms
☐ Thorium-232	N/A	Kilograms
☐ Other: Specify	N/A	Kilograms

Special Nuclear Material

Radioisotope	Manufacturer/ Model No.	Quantity	Yes	No

❒ Uranium-234 ❒ Uranium-235 ❒ Plutonium-238 ❒ Plutonium-239 ❒ Other: Specify	NONE USED	Not to exceed the maximum activity per source/device as specified in the Sealed Source and Device Registration Sheet	❒	❒

Unsealed or Uncontained Materials

Identify each individual isotope requested:

Radioisotope	Chemical or Physical Form				Total Activity Requested
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	NONE
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	NONE
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	NONE
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	NONE

OR

Identify your request for Type B or Type C quantities of material by filling out the table below:

Radioisotope	Yes	No
• Any radioisotope identified in 10 CFR 33.100, Schedule A, Column I — (Type B License of Broad Scope)	❒	☒
OR		
• Any radioisotope identified in 10 CFR 33.100, Schedule A, Column II — (Type C License of Broad Scope)	❒	☒

AND IF APPLICABLE

Identify *individual isotopes* identified in 10 CFR 33.100 Schedule A, Column I or II, that requested quantities exceeding amounts authorized in Column I or II.

Radioisotope	Chemical or Physical Form				Total Activity Requested
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	NONE
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	NONE
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	NONE
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	NONE

AND

Identify any uncontained source or special nuclear materials that should be included in the license:

Source Material		
❒ Depleted Uranium	NONE	Kilograms
❒ Uranium-238	NONE	Grams
❒ Thorium-232	NONE	Grams
❒ Other:	NONE	Grams
Special Nuclear Material Less than Critical Mass Quantities		
❒ Uranium-234	NONE	Grams
❒ Uranium-235	NONE	Grams
❒ Plutonium-238	NONE	Grams
❒ Plutonium-239	NONE	Grams

For those individuals who will provide commercial services on sealed sources/devices and will be required to *take possession of materials incident to providing services*:

Sealed Sources/Devices Possessed Incident to Providing Services				
Radioisotope	**Manufacturer/ Model No.**	**Quantity**	**Yes**	**No**
		Not to exceed the maximum activity per source/device as specified in the Sealed Source and Device Registration Sheet	❒	❒
		Not to exceed the maximum activity per source/device as specified in the Sealed Source and Device Registration Sheet	❒	❒

Source Material		
❒ Uranium-238	NONE	Kilograms
❒ Thorium-232	NONE	Grams
❒ Other:	NONE	Grams
❒ Depleted Uranium	NONE	Kilograms

Special Nuclear Material Less than Critical Mass Quantities		
☐ Uranium-234	None	Grams
☐ Uranium-235	None	Grams
☐ Plutonium-238	None	Grams
☐ Plutonium-239	None	Grams

For those individuals who will provide commercial services involving unsealed or uncontained material and will be required to take possession of these materials incident to providing services:

Unsealed or Uncontained Materials

Identify each individual isotope requested:

Radioisotope	Chemical or Physical Form				Total Activity Requested
	☐ Gas	☐ Liquid	☐ Solid	☐ Other: Specify	None
	☐ Gas	☐ Liquid	☐ Solid	☐ Other: Specify	None
	☐ Gas	☐ Liquid	☐ Solid	☐ Other: Specify	None
	☐ Gas	☐ Liquid	☐ Solid	☐ Other: Specify	None

OR

Identify your request for Type B or Type C quantities of materials by filling out the table below:

Radioisotope	Yes	No
• Any radioisotope identified in 10 CFR 33.100, Schedule A, Column I — (Type B License of Broad Scope)	☐	☒
OR		
• Any radioisotope identified in 10 CFR 33.100, Schedule A, Column II — (Type C License of Broad Scope)	☐	☒

AND IF APPLICABLE

Identify *individual isotopes* identified in 10 CFR 33.100 Schedule A, Column I or II, that requested quantities exceeding amounts authorized in Column I or II.

Radioisotope	Chemical or Physical Form				Total Activity Requested
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	None
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	None
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	None
	❒ Gas	❒ Liquid	❒ Solid	❒ Other: Specify	None

AND

Identify any uncontained source or special nuclear materials that should be included in the license:

Source Material		
❒ Depleted Uranium	0	Kilograms
❒ Uranium-238	0	Grams
❒ Thorium-232	0	Grams
❒ Other:	0	Grams
Special Nuclear Material		
❒ Uranium-234	0	Grams
❒ Uranium-235	0	Grams
❒ Plutonium-238	0	Grams
❒ Plutonium-239	0	Grams

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
5	**RADIOACTIVE MATERIAL** **Financial Assurance and Recordkeeping For Decommissioning** • Pursuant to 10 CFR 30.35(g), we shall maintain drawings and records important to decommissioning and transfer these records to a new licensee before licensed activities are transferred, or assign the records to the appropriate NRC Regional Office before the license is terminated. **OR** • If financial assurance is required, submit evidence.	☒	☐		☐

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
6	**PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED**				
	• Leak Test Analysis	☐	☒		
	• Environmental Sample Analysis	☐	☒		
	• Instrument/Dosimeter Calibration	☒	☐		
	• Instruction	☐	☒		
	Possession Incident to Performing the Following Services on Sealed Sources and Devices			☒	
	• Installation	☐	☐		☐
	• Radiation Surveys	☐	☐		☐
	• Removal	☐	☐		☐
	• Disposal	☐	☐		☐
	• Relocation	☐	☐		☐
	• Repair	☐	☐		☐
	• Source Exchange	☐	☐		☐
	• Routine Maintenance	☐	☐		☐
	• Non-routine Maintenance	☐	☐		☐
	• Source Retrieval	☐	☐		☐
	• Transportation	☐	☐		☐
	• Packaging	☐	☐		☐
	• Leak Test Sample Acquisition	☐	☐		☐
	• Customer Training	☐	☐		☐
	• Other Services not identified above, excluding activities involving critical mass quantities of special nuclear material: Specify.	☐	☐		☐

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
6	**PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED *(Cont'd.)***				
	Possession Incident to Performing Commercial Services Utilizing Unsealed or Uncontained Licensed Material:			☒	
	Nuclear Laundry	☐	☐		
	Waste Management Services:				
	• Commercial Incineration	☐	☐		
	• Commercial Compaction/Super Compaction	☐	☐		
	• Commercial Solidification/Vitrification	☐	☐		
	• Packaging, Repackaging, and Transportation of Radioactive Waste	☐	☐		
	• Decontamination	☐	☐		
	• Decommissioning	☐	☐		
	• Site Characterization	☐	☐		
	• Radiation protection or health physics training and instruction	☐	☐		
	• Other Services not identified above, excluding activities involving critical mass quantities of special nuclear material: Specify.				☐

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
7	**INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE** **Radiation Safety Officer** • The name of the proposed RSO: Matthew M. Kish **AND EITHER** • The specific training and experience of the RSO; **OR** • Alternative information demonstrating that the proposed RSO is qualified by training and experience, e.g., listed by name as an authorized user or the RSO on an NRC or Agreement State license that requires a radiation safety program of comparable size and scope.				☒ ☐

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
8	**TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS**				
	Authorized Users				
	• "Before using licensed material, authorized users will receive the training described in Appendix H of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."	☒	☐		
	OR				
	• A description of the training and experience for proposed authorized users.				☐
	Ancillary Personnel				
	• "Before using licensed materials, ancillary personnel will have successfully completed the classroom training portion of the training course described in Appendix H of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."	☒	☐		
	OR				
	• A description of the radiation safety training program, including topics covered, groups of workers, assessment of training, qualifications of instructors, and the method and frequency of training.				☐

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
9	**FACILITIES AND EQUIPMENT** **Permanent Facilities Specifically Identified on the License**				
	• Leak Test and Environmental Sample Analysis Providers: No response required for facilities. (Equipment is discussed in Item 10, Radiation Safety Program.)	No Response is Necessary for this Section			
	• Instrument Calibration: If only sealed sources are possessed in registered devices designed to emit a collimated beam for the purpose of instrument calibration, no response required. (Equipment is discussed in Item 10, Radiation Safety Program.)	No Response is Necessary for this Section			
	• Services that involve handling of sealed sources in a shielded container: No response required. (Equipment is discussed in Item 10, Radiation Safety Program.)	No Response is Necessary for this Section			
	• Services that involve handling of sealed sources outside a shielded container:	☒	☐		
	– Submit a drawing or sketch of the proposed permanent facility identifying areas where radioactive materials, including radioactive wastes, will be used or stored.				☒
	– Show in the drawings the relationship and distance between restricted areas and adjacent unrestricted areas.				☒
	– Specify in the drawings shielding materials (concrete, lead, etc.) and means for securing radioactive materials from unauthorized removal.				☒
	– Drawings, sketches, diagrams, etc. should indicate the scale or include dimensions on each drawing or sketch.				☒
	– Describe engineered safety systems, e.g., area monitors, interlocks, alarms, etc.				☒

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
9	**FACILITIES AND EQUIPMENT** ***(Cont'd.)***				
	Permanent Facilities Specifically Identified on the License Requesting the Use of Unsealed or Uncontained Material				
	• Leak Test and Environmental Sample Analysis Providers: No response required for facilities. (Equipment is discussed in Item 10, Radiation Safety Program.)	No Response is Necessary for this Section			
	• Other services that involve handling of unsealed radioactive material at permanent facilities or field stations identified on the license:	☐	☒		
	– Describe the permanent facilities and equipment to be made available at each location where unsealed radioactive material will be used or handled.			☒	☐
	– Include a description of the area(s) assigned for the receipt, storage, security, preparation, handling, waste storage and measurement of radioactive materials.			☒	☐
	– Submit a facility diagram showing the proximity of licensed materials to unrestricted areas.	☐	☒	☒	☐
	– Drawings, sketches, diagrams, etc. should indicate the scale, or include dimensions on each drawing or sketch.			☒	
	– Submit a diagram, sketch, or drawing, when applicable, that identifies areas where radioactive materials may become airborne. The diagram should contain descriptions of the ventilation systems, with pertinent airflow rates, filtration equipment, sample collection points, and monitoring systems.			☒	☐
	– Submit a diagram of radioactive waste handling equipment that includes incinerators, compactors, solidification equipment, hold-up tanks, sample collection points, etc.			☒	☐

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
9	**FACILITIES AND EQUIPMENT** ***(Cont'd.)***				
	Permanent Facilities Specifically Identified on the License Requesting the Use of Unsealed or Uncontained Material ***(Cont'd.)***				
	– Describe proposed laundry facilities, if applicable, used for contaminated protective equipment and clothing. Specify how the contaminated waste water from the laundry machines or sinks is disposed. Operating and emergency procedures should address decontamination of the laundry area and equipment.			☒	☐
	– Describe protective clothing (such as rubber gloves, coveralls, respirators, and face shields), auxiliary shielding, absorbent materials, secondary containers for waste water storage for decontamination purposes, plastic bags for storing contaminated items, etc., that will be available.			☒	☐
	– Identify specialized handling tools, facility interlocks designed to prevent operation of systems in the event that operation of the system could result in accidental exposure or release of material (e.g., HEPA filters, ventilation system, etc.) or equipment.			☒	☐
	Temporary Job Site Locations				
	• No facility description is required for use of materials at temporary job sites.	Need Not Be Submitted With Application			

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM** The applicant is required to establish and submit its radiation protection program. Each item listed below should be addressed in the corresponding sections of this guide.				
	• Development and implementation of an ALARA program.	☒	☐	☐	☒
	• Description of equipment and facilities adequate to protect personnel, the public and the environment.	☒	☐	☐	☒
	• Confirmation that licensed activities are conducted only by individuals qualified by training and experience.	☒	☐	☐	☒
	• Development and maintenance of written operating and emergency procedures.	☒	☐	☐	☒
	• Implementation of an audit program to ensure that, at least annually, the radiation safety program is reviewed.	☒	☐	☐	☒
	• Description of organization structure and individuals responsible for ensuring day-to-day oversight of the radiation safety program.	☒	☐	☐	☒
	• Establishment and management of a radiation safety and decommissioning records system.	☒	☐	☐	☒
	• Methods or procedures for preventing the release of contaminated material and equipment.	☒	☐	☐	☒
	• Methods or procedures for preventing personnel contamination. Radiation safety procedures and the authorized users responsibilities unique to each type of service operation requested in the application.	☒	☐	☐	☒
	• Radiation safety procedures.	☒	☐	☐	☒
	• Equipment, techniques, and corresponding radiation safety procedures associated with providing services involving either sealed sources or unsealed materials.	☒	☐	☐	☒
	Audit Program	Need Not Be Submitted With Application			

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM** ***(Cont'd.)***				
	Radiation Monitoring Instruments				
	• A description of the instrumentation described in Section 8.10.2 of NUREG-1556, Vol. 18, "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses," dated November 2000, that will be used to perform required surveys. "We will use instruments that meet the radiation monitoring instrument specifications published in Appendix J of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000.' We reserve the right to upgrade our survey instruments as necessary."	☒	☐		☒
	OR				
	• A description of the instrumentation described in Section 8.10.2 of NUREG-1556, Vol. 18, "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses," dated November 2000, that will be used to perform required surveys. "We will use instruments that meet the radiation monitoring instrument specifications published in Appendix J of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000. Additionally, we will implement the model survey meter calibration program published in Appendix J of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000. We reserve the right to upgrade our survey instruments as necessary."				☐

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM** ***(Cont'd.)***				
	Radiation Monitoring Instruments ***(Cont'd.)***				
	OR				
	• A description of alternative equipment and/or procedures for ensuring that appropriate radiation monitoring equipment will be used during licensed activities and that proper calibration and calibration frequency of survey equipment will be performed. The statement, "We reserve the right to upgrade our survey instruments as necessary," should be added to the response.				☒
	Material Receipt and Accountability				
	• "Ordering licensed material and package receipt and opening will follow the model procedures in Appendix K of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."	☒	☐		
	OR				
	• Submit a description of procedure(s) for ordering licensed material and package receipt and opening.				☒
	AND				
	• For unsealed licensed material, submit a description of procedure(s) for ensuring material accountability.				☐

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM** ***(Cont'd.)***				
	Occupational Dosimetry				
	• "We will have a prospective evaluation and determine that unmonitored individuals are not likely to receive, in one year, a radiation dose in excess of 10% of the allowable limits in 10 CFR Part 20, or we will monitor individuals in accordance with the criteria in the section entitled 'Occupational Dose' in NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."	☒	☐		
	OR				
	• A description of an alternate method for demonstrating compliance with the referenced regulations.				☐
	AND/OR				
	• Provide a bioassay program when using unsealed radioactive materials. If an applicant elects to provide a bioassay program that is less conservative than recommended in Regulatory Guide 8.20, its rationale should be stated.				☐
	AND				
	• Bioassay programs must include what the applicant considers and acceptable interval or schedule for conducting bioassays, identify action levels or guidelines, and describe specific actions to be taken when action levels are exceeded. Because of the complex nature of bioassay and corresponding data analysis, it is acceptable for applicants to make reference to the procedures in NRC guidance documents.				☐

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM *(Cont'd.)***				
	Occupational Dosimetry *(Cont'd.)*				
	OR				
	• Contract with an outside group for bioassay services. Provide a commitment that each vendor is licensed or otherwise authorized by NRC or Agreement State to provide required bioassay services.				☐
	Public Dose	Need Not Be Submitted With Application			
	The applicant is not required to, and should not, submit a response to the public dose section during the licensing phase. This matter will be addressed during an inspection.				
	Operating and Emergency Procedures				
	• Procedure for obtaining an agreement with customers outlining the responsibilities of both the customer and service provider, when performing service operations at a customer's facility	☐	☐	☒	☒
	• Instructions for handling and using licensed materials.	☒	☐	☐	☒
	• Instructions for maintaining security during storage and transportation.	☒	☐	☐	☒
	• Instructions to keep licensed material under control and immediate surveillance during use.	☒	☐	☐	☒
	• Steps to take to keep radiation exposures ALARA.	☒	☐	☐	☒
	• Steps to maintain accountability during use.	☒	☐	☐	☒
	• Steps to control access to work sites.	☒	☐	☐	☒
	• Steps to take and whom to contact when an emergency occurs.	☒	☐	☐	☒
	• Instructions for using remote handling tools when handling sealed sources, except low-activity calibration sources.	☐	☐	☒	☐
	• Methods and occasions for conducting radiation surveys, including surveys for detecting contamination.	☒	☐	☐	☒

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM** ***(Cont'd.)***				
	Operating and Emergency Procedures ***(Cont'd.)***				
	• Procedures to minimize personnel exposure during routine use and in the event of an incident, including exposures from inhalation and ingestion of licensed unsealed materials.	☒	☐	☐	☒
	• Methods and occasions for locking and securing stored licensed materials.	☒	☐	☐	☒
	• Procedures for the implementation and adherence to good health physics practices while performing service operations:				
	– Minimization of distance to areas, to the extent practicable, where licensed materials are used and stored	☒	☐	☐	☒
	– Maximization of survey frequency, within reason, to enhance detection of contamination	☒	☐	☐	☒
	– Segregation of radioactive material in waste storage areas	☐	☐	☒	☐
	– Segregation of sealed sources and tracer materials to prevent cross-contamination	☐	☐	☒	☐
	– Separation of radioactive material from explosives	☐	☐	☒	☐
	– Separation of potentially contaminated areas from clean areas by barriers or other controls.	☐	☐	☒	☐
	• Personnel monitoring, including bioassays, and the use of personnel monitoring equipment.	☒	☐	☐	☒
	• Transportation of licensed materials to temporary job sites, packaging of licensed materials for transport in vehicles, placarding of vehicles when needed, and physically securing licensed materials in transport vehicles during transportation to prevent accidental loss, tampering, or unauthorized removal.	☐	☐	☒	☐
	• Procedures for picking up, receiving, and opening packages containing licensed materials, in accordance with 10 CFR 20.1906.	☒	☐	☐	☒
	• Instructions for maintaining records in accordance with the regulations and the license conditions.	☒	☐	☐	☒

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM** ***(Cont'd.)***				
	Operating and Emergency Procedures ***(Cont'd.)***				
	• Procedures for identifying and reporting to NRC defects and noncompliance as required by 10 CFR 21.21(a) of this chapter.	☒	☐	☐	☒
	• Procedures and actions to be taken if a sealed source is ruptured, including actions to prevent the spread of contamination and minimize inhalation and ingestion of licensed materials and actions to obtain suitable radiation survey instruments.	☒	☐	☐	☒
	• Instructions for the proper storage and disposal of radioactive waste.	☒	☐	☐	☒
	• Procedures to be followed in the event of uncontrolled release of radioactive unsealed licensed material to the environment, including notification of the RSO, NRC, and other Federal and state agencies.	☐	☐	☒	☐
	• Procedures for identifying and reporting to NRC defects and noncompliance. See Table 8.4, which describes the typical incident notifications required by NRC regulations.	☒	☐	☐	☒

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM** ***(Cont'd.)***				
	Surveys				
	• "We will survey our facility and maintain contamination levels in accordance with the survey frequencies and contamination levels published in NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."	☒	☐		
	OR				
	• Submit description of alternative method for demonstrating how to evaluate a radiological hazard.				☐
	Leak Tests				
	• "Leak tests, when required by the license, will be performed at intervals approved by NRC or an Agreement State and specified in the Sealed Source and Device Registration Sheet. Leak tests will be performed by an organization authorized by NRC or an Agreement State to provide leak testing services to other licensees or using a leak test kit supplied by an organization authorized by NRC or an Agreement State to provide leak test kits to other licensees and according to the kit supplier's instructions."	☒	☐	☐	
	OR				
	• "Leak testing will follow the model procedures in Appendix O of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."	☐	☐		

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM** ***(Cont'd.)***				
	Leak Tests ***(Cont'd.)***				
	OR				
	• "Leak testing procedures and analysis will be done by the applicant." Provide the information in supporting a request to perform leak testing. Appendix O of NUREG-1556, Vol. 18, "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses," dated November 2000, may serve as guidance.	❒	❒	☒	❒
	OR				
	• "We will provide commercial leak test kits as described in the model leak test kit description in Section 8.9.8 of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."	❒	❒	☒	
	AND				
	• "We will provide leak test kits as described in the model leak test kit description in Section 8.9.8 of NUREG-1556, Vol. 18." • Provided is a sample of the leak test kits that will be distributed commercially for each type of sealed source/device combination we plan to provide.	❒	❒	☒	❒

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM** ***(Cont'd.)***				
	Maintenance				
	• "We will implement and maintain procedures for conducting routine maintenance of our device according to each manufacturer's (or distributor's) written recommendations and instructions."	☒	☐		☒
	OR				
	• Alternative procedures are provided for NRC's review. • "We will have the device manufacturer (or distributor) or other person authorized by NRC or an Agreement State to perform non-routine maintenance on our devices."	☐	☐		☐
	OR				
	• Information requested in Appendix P of NUREG-1556, Vol. 18, "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses," dated November 2000, is provided to support requests to conduct non-routine maintenance procedures.				☐
	Minimization of Contamination	No Response is Necessary for this Section			
	• NRC will consider that the criteria for minimization of contamination has been met if the applicant's responses satisfy the criteria in the following sections: "Radioactive Material – Unsealed and/or Sealed Sources," "Facilities and Equipment," "Radiation Safety Program – Safe Use of Radioisotopes and Emergency Procedures," "Radiation Safety Program – Surveys," and "Radiation Safety Program – Waste Management."				

Item No.	Title and Criteria	Yes	No	N/A	Description Attached
10	**RADIATION SAFETY PROGRAM *(Cont'd.)***				
	Transportation No response is needed from applicants during the licensing phase.	No Response is Necessary for this Section			
	Waste Management				
	• "We will use the model waste procedures published in Appendix N of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."	☐	☐	☐	
	• If the applicant wishes to use only selected model procedures, provide a statement that: "We will use the (specify either: (1) Decay-In-Storage; or (2) Disposal of Liquids Into Sanitary Sewerage) model waste procedures that are published in Appendix N of NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000."	☒	☐	☐	
	OR				
	• Provided are procedures for waste collection, storage, and disposal by any of the authorized methods described in this section.				☒
	OR				
	• If access to a radioactive waste burial site is unavailable, the applicant should request authorization for extended interim storage of waste. Applicant should refer to NRC IN 90-09, "Extended Interim Storage of Low-Level Radioactive Waste by Fuel Cycle and Materials Licensees," dated February 1990, for guidance if extended storage is required.	☐	☐	☐	☐

This is to acknowledge the receipt of your letter/application dated

4/16/2007, and to inform you that the initial processing which includes an administrative review has been performed.

☑ NEW LICENSE APPLICATION (03037459)
There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

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A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 140434.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader

	:	(FOR LFMS USE)
	:	INFORMATION FROM LTS
BETWEEN:	:	----------
	:	
License Fee Management Branch, ARM	:	Program Code: 03221
and	:	Status Code: 3
Regional Licensing Sections	:	Fee Category: _____
	:	Exp. Date: 0
	:	Fee Comments: _____
	:	Decom Fin Assur Reqd: _
	::	::

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED
   Applicant/Licensee: POLIMASTER TECHNOLOGY, INC.
   Received Date: 20070424
   Docket No: 3037459
   Control No.: 140434
   License No.: 45-31243-01
   Action Type: New Licensee

2. FEE ATTACHED
   Amount: $1,700.00
   Check No.: 10032

3. COMMENTS

Signed M A. Serbin
Date 4/25/2007

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered /__/)

1. Fee Category and Amount: _____

2. Correct Fee Paid. Application may be processed for:
   Amendment _____
   Renewal _____
   License _____

3. OTHER _____
   _____

Signed _____
Date _____