REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NY 0502 D 110 G DATE: December 31, 1997

DEVICE TYPE: Static Eliminator

MODEL: Nuclecel Ionizer Model P-2063

DISTRIBUTOR: NRD Inc.
(formerly Nuclear Radiation Development, Inc.)
2937 Alt Boulevard
Grand Island, New York 14072

MANUFACTURER: NRD Inc.
(formerly Nuclear Radiation Development, Inc.)
2937 Alt Boulevard
Grand Island, New York 14072

SEALED SOURCE MODEL DESIGNATION: NRD Model P-001

ISOTOPE: MAXIMUM ACTIVITY:

Polonium - 210 31.5 millicuries (1.17 GBq)

LEAK TEST FREQUENCY: 13 months

PRINCIPAL USE: (O) Ion Generators, Static Eliminators

CUSTOM DEVICE: _____ YES _____X_____ NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NY 0502 D 110 G DATE: December 31, 1997

DEVICE TYPE: Static Eliminator

DESCRIPTION:

The P-2063 consists of a stainless steel cylindrical grid wrapped with a polonium foil source. The foil is secured around the cylinder with tape and covered by a stainless steel strap for protection from physical abuse. The cylinder is protected from crushing by aluminum plates at each end. Access to the interior of the cylinder is prevented by wire guards, fastened in place by tamper resistant screws. There is no access to the radioactive foil unless the assembly is intentionally tampered with or destroyed.

LABELING:

All devices are labeled in compliance with 10 CFR 32.51. (See diagram in Attachment 2.)

DIAGRAM:

See Attachments 1 through 5.

CONDITIONS OF NORMAL USE:

The purpose of the Model P-2063 is to neutralize static electrical charges in static sensitive operations. The device is normally placed in an atmospheric pressure air stream so that the airflow delivers ions generated by the device to the work area. Types of users include manufacturers of electronic devices, aircraft, cloth, plastic, paper, rocket engines, powders, etc.. Installation is simple and is done by the general licensee, in accordance with instructions provided by the manufacturer (See diagram in Attachment 3.)

The useful life of the Model P-2063 is 12 months. The devices are distributed by the manufacturer under a 12 month lease agreement.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

DEVICE TYPE: Static Eliminator

PROTOTYPE TESTING:

Prototype testing was performed by the manufacturer in accordance with ANSI N542 and ISO-2919. The respective classifications for the source-device combination are ANSI 77C22222 and ISO/C22222.

EXTERNAL RADIATION LEVELS:

Polonium-210 decays almost exclusively by alpha emission, although there is one very low abundance (0.0011%) 0.803 MeV gamma. External exposure rates are therefore minimal. The manufacturer has measured these using a calibrated sodium iodide detector/multichannel analyzer system, and found the exposure rate at 6 inches from the source to be less than 5 microroentgens per hour. (See radiation profiles, Attachments 4 and 5.)

QUALITY ASSURANCE AND CONTROL:

The manufacturer maintains a Quality Assurance program adequate for licensing purposes. Outgoing units are 100% inspected for defects in workmanship, functionality, and radioactive leakage.

LIMITATIONS AND/OR OTHER CONDITIONS OF USE:

- The Model P-2063 may be distributed to persons generally licensed pursuant to 12 NYCRR 38, Section 38.41, Table 3, Item (b), or equivalent provisions of the USNRC or an Agreement State.
- These devices are not intended for use in extreme environments.
- Units should be returned to the manufacturer for leak testing at intervals not to exceed 13 months. This will be accomplished under the terms of a 12-month lease agreement between the manufacturer and the general licensee.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

DEVICE TYPE: Static Eliminator

LIMITATIONS AND/OR OTHER CONDITIONS OF USE:

- This registration sheet and the information contained in the references shall not be changed without written consent of the New York State Department of Labor.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information submitted and test data cited below, we conclude that NRD, Inc. has submitted sufficient information to provide reasonable assurance that:

- The device can be safely operated by persons having no training in radiological protection.
- Under ordinary conditions of handling, storage, and use of the device, the radioactive material contained in the device will not be released or inadvertently removed from the device, and it is unlikely that any person will receive in 1 year a dose in excess of 10 percent of the annual limits specified in Section 20.1201(a), of 10 CFR 20.
- Under accident conditions associated with handling, storage and use of the device, it is unlikely that any person would receive an external radiation dose or dose commitment in excess of the dose to the appropriate organ as specified in the table below:

Part of Body	Dose (rem/Sv)
Whole body; head and trunk; active blood forming organs; gonads; or lens of eye	15 / 0.15
Hands and forearms; feet and ankles; localized areas of skin averaged over areas no larger than 1 square centimeter	200 / 2.0
Other organs	50 / 0.5

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NY 0502 D 110 G DATE: December 31, 1997

DEVICE TYPE: Static Eliminator

SAFETY ANALYSIS SUMMARY:

- Thousands of similar devices containing P-001 foils have been in use for decades with no reports of injury or significant radiological misadventure. We conclude that the Model P-2063 will perform at the same level of safety.

REFERENCES:

The following supporting documents are hereby incorporated by reference and made part of this registry document.

- NRD, Inc. Manufacturing and Testing Protocol for the Nuclecel Ionizer Model P-2063, dated October 15, 1995, revised June 11, 1997.
- NRD, Inc. letter dated June 11, 1997.

ISSUING AGENCY:

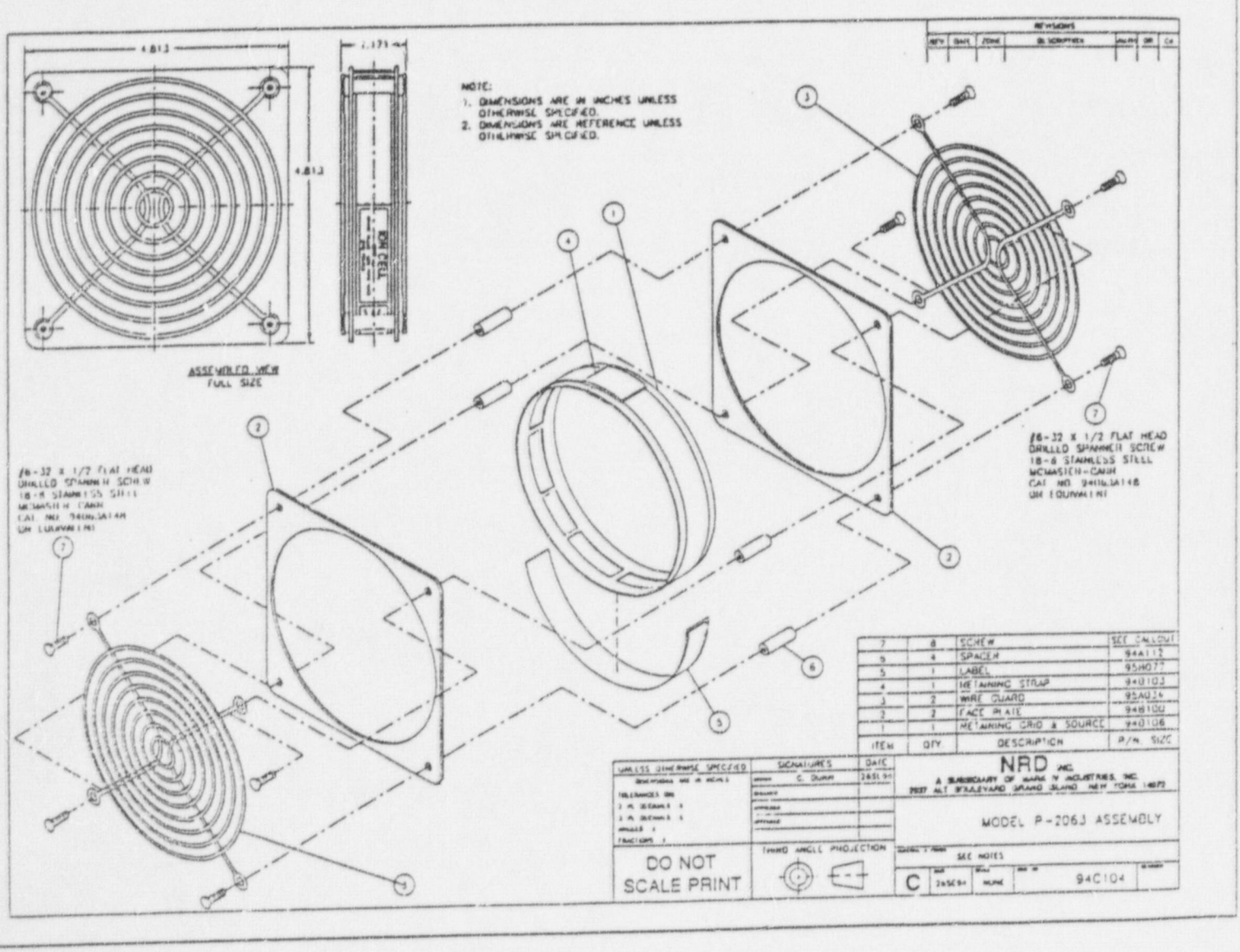
State of New York Department of Labor

Date: December 31, 1997 Reviewer: Clayton J. Bradt

Date: December 31, 1997 Concurrence: Desmond C. Gordon

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

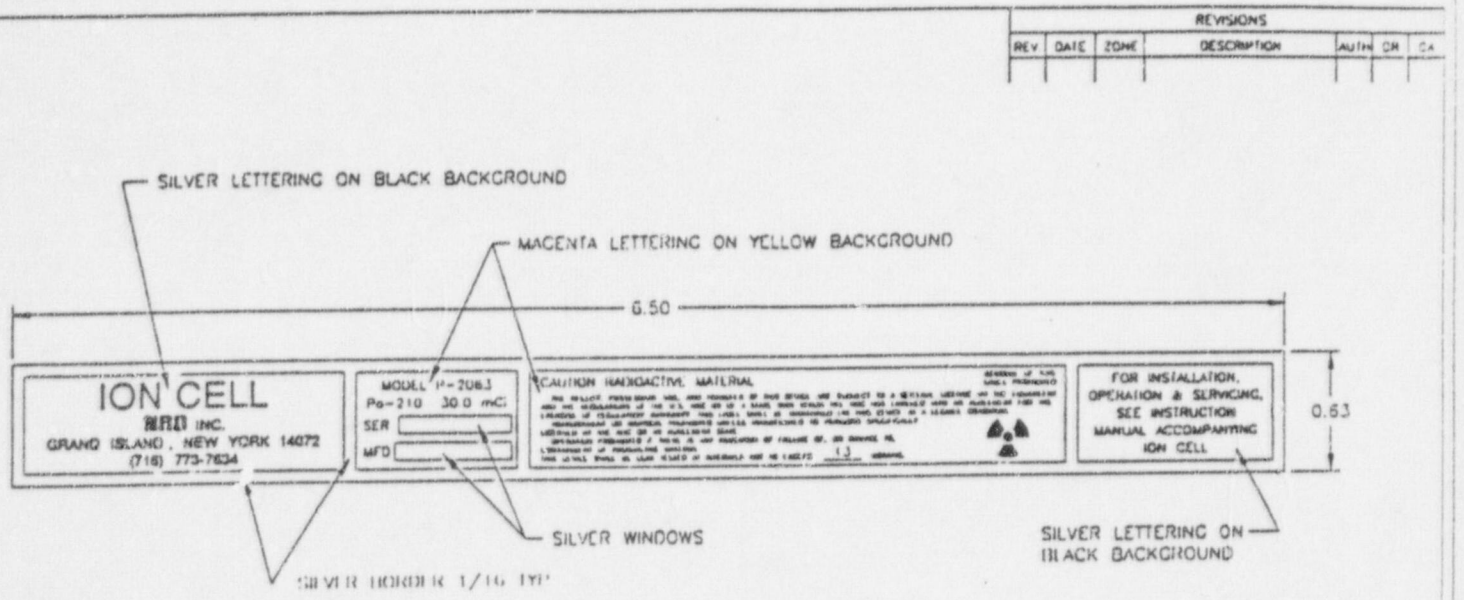
NO: NY 0502 D 110 G DATE: December 31, 1997 Attachment 1



NUCLECEL MODEL P-2063

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NY 0502 D 110 G **DATE:** December 31, 1997 **Attachment 2**



NOTES:
1. MATERIAL: 0.003 THICK MYLAR
   OR
   0.002 ALUMINUM BASE WITH 0.001 MYLAR OVERLAY
2. LABEL TO HAVE A PRESSURE SENSITIVE ADHESIVE BACKING.
3. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

	SIGNATURES	DATE
DRAWN	C. DUNN	16JN95
CHECKED		
APPROVED		
APPROVED		

THIRD ANGLE PROJECTION

DO NOT SCALE PRINT

NRD INC.
A SUBSIDIARY OF MARK IV INDUSTRIES, INC.
2937 ALT BOULEVARD GRAND ISLAND, NEW YORK 14072

LABEL
FOR MODEL P-2063

SEE NOTES

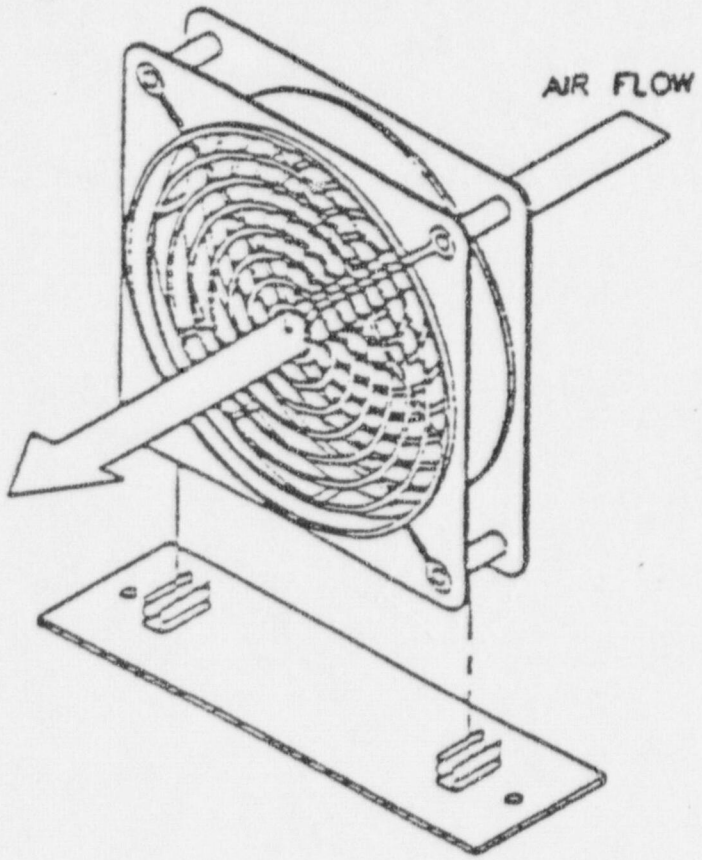
B | 16JN95 | NONE | 958077

LABEL

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NY 0502 D 110 G DATE: December 31, 1997 Attachment 3

P-2063 NUCLECEL IONIZER

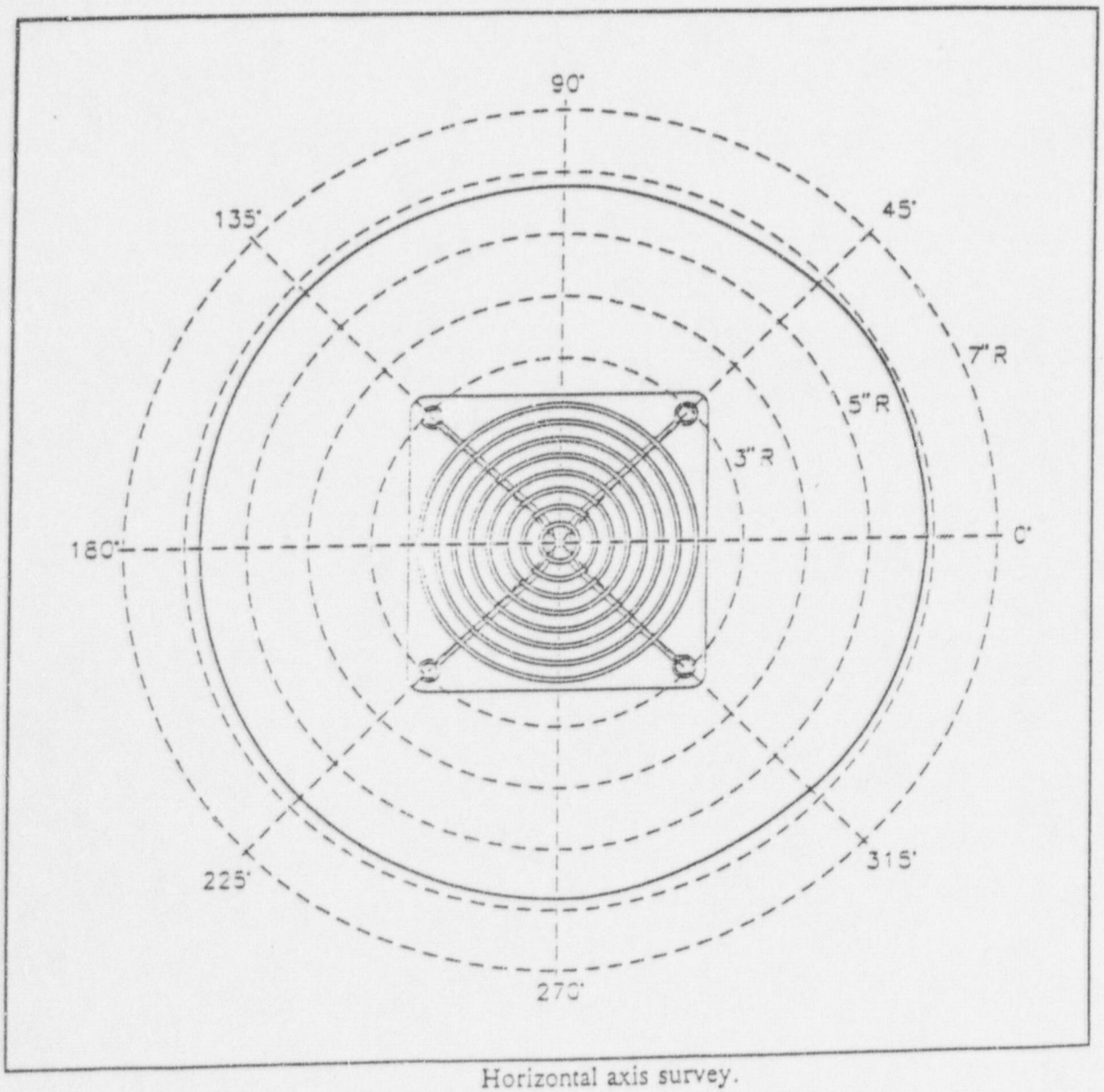


TYPICAL MOUNTING PLATE

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NY 0502 D 110 G DATE: December 31, 1997 Attachment 4

P-2036 Gamma Radiation Profile
Exposure Rate = 0.005 mR/hr

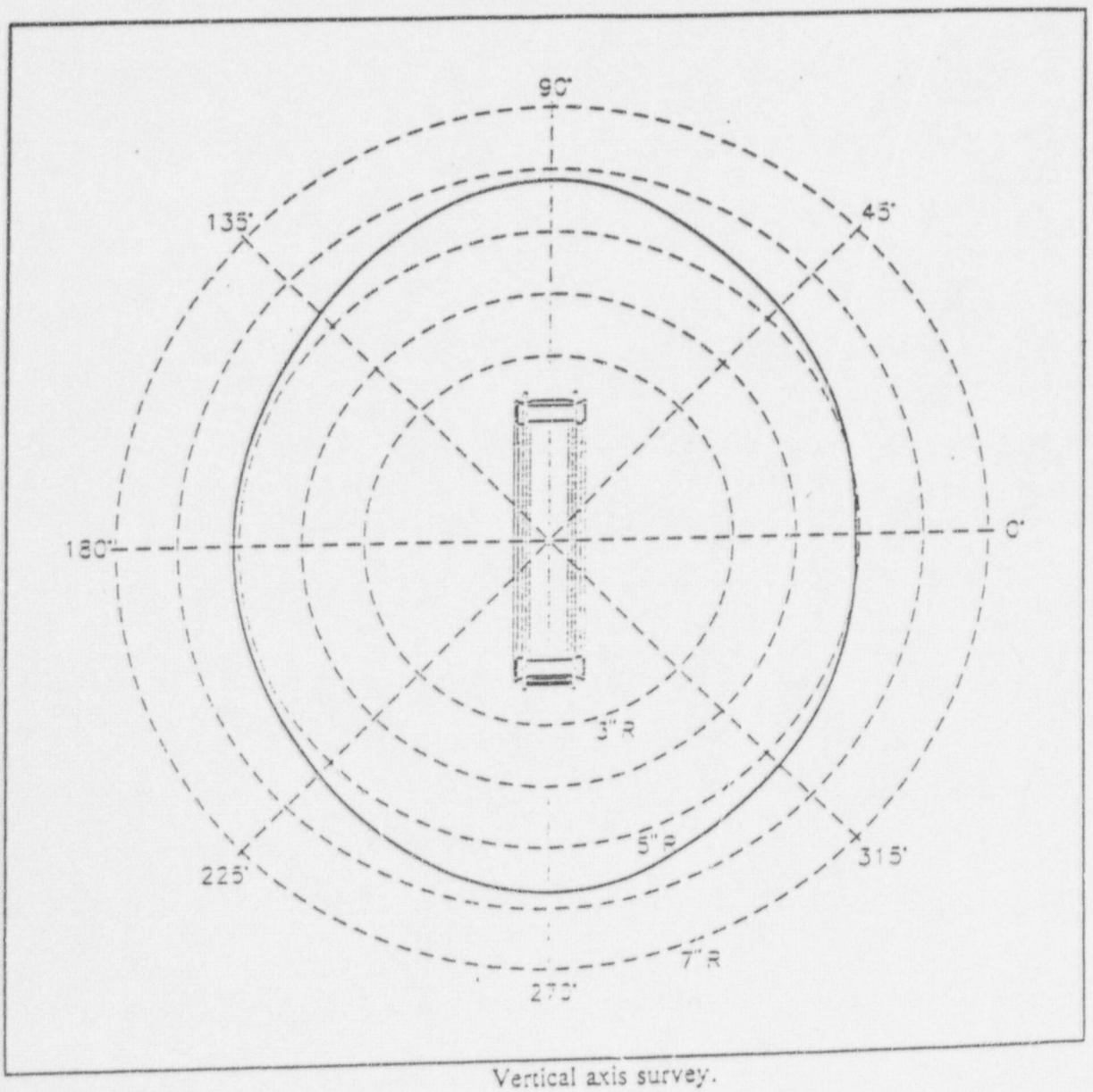


Horizontal axis survey.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NY 0502 D 110 G DATE: December 31, 1997 Attachment 5

P-2036 Gamma Radiation Profile
Exposure Rate = 0.005 mR/hr



Vertical axis survey.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-807-G DATE: September 28, 1995

DEVICE TYPE: Density Gauge

MODEL: PLG-2

MANUFACTURER/DISTRIBUTOR: Nuclear Research Corporation
125 Titus Avenue
Warrington, PA 18976

SEALED SOURCE MODEL DESIGNATION: Nuclear-Chicago Model 850233
3M Model 4P6E

ISOTOPE: Cesium-137

MAXIMUM ACTIVITY: 2.5 curies (92.5 GBq)

LEAK TEST FREQUENCY: 6 Months

PRINCIPAL USE: (D) Gamma Gauge

CUSTOM DEVICE: _____ YES ___X___ NO

95MC0114 PP

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-807-G DATE: September 28, 1995

DEVICE TYPE: Density Gauge

DESCRIPTION:

The Model PLG-2 density gauge is the same as the PLG-1 except for several modifications to the source holder, and was also designed to measure density differences in cartridges. The holder was redesigned to incorporate improvements which were based on field experience with the PLG-1. The model PLG-2 is used exclusively in Army and contractor ordnance plants. The specimen to be measured moved by a screw-fed conveyor between the source holder and detector, and inadequate propellent or core in the specimen caused rejection.

The gap between the source holder and detector is adjustable up to 2.5" (6.4 cm). The gauge and conveyor are covered by a heavy plastic shield to prevent inadvertent placement of hands (or other foreign objects) into the primary beam and conveyor belt path, and to create a barrier so that radiation levels at the surface would be less than 5 mR/hr (0.5 mSv/hr).

The sealed source is installed in a threaded, cylindrical tungsten slug and is held in place within the slug by a threaded stainless steel encapsulated screw. The slug is then screwed into a steel jacketed lead sphere and held in place by a slug lock and by coating the threads with Glyptal (an alkyd) prior to insertion.

To exposed the source, the shutter is moved horizontally by means of air pressure. To shield the source, air pressure is removed and a return spring moves the shutter to the fully closed position. If air pressure is inadvertently lost, the return spring will automatically close the shutter.

In addition to a red "on" light indicator located on the top of the source holder, a red mechanical indicator rod is mounted on the end of the shutter. The rod is fully extended when the source is exposed and fully withdrawn into the source holder when the source is fully shielded.

DIAGRAM:

See attachment 1.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

DEVICE TYPE: Density Gauge

LABELING:

The manufacturer indicated the devices are labeled in accordance with Section 32.51, 10 CFR Part 32 requirements for devices generally licensed at the time of distribution.

CONDITIONS OF NORMAL USE:

These devices are intended for use in munitions plants where fires and explosions are possible. These devices would not typically be subjected to corrosive or excessively abrasive atmospheres.

PROTOTYPE TESTING:

These devices were manufactured and distributed under a specific license issued to the Industrial Nucleonics (Accuray) since 1969. Nuclear Research Corp. and the manufacturer did not supply prototype testing for these devices, but rather, relied on the design, construction, material selection and past historical use data of the model PLG-1 devices for assurance of the integrity of the device.

EXTERNAL RADIATION LEVELS:

When loaded with maximum activity, radiation levels on the surface of the source holder do not exceed 8.5 mR/hr (85 μSv/hr), and at 12" (30.5 cm) from the surface are less than 5 mR/hr (50 μSv/hr) with the source fully shielded. The plastic shield keeps personnel from placing their hands in the primary beam when the source is exposed.

QUALITY ASSURANCE AND CONTROL:

Nuclear Research Corporation did not supply quality assurance and control information for these devices. The devices were originally approved for distribution by Industial Nucleonics (Accuray) under an Atomic Energy Commission specific license. Nuclear Research Corporation assumed all responsibility for these devices in 1984.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

DEVICE TYPE: Density Gauge

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- The devices were distributed to persons generally licensed pursuant to Section 31.5, 10 CFR Part 31 of the Atomic Energy Commission regulations or equivalent regulations of an Agreement State.
- The devices are to be leak tested at intervals not to exceed 6 months using techniques capable of detecting 0.005 microcurie (185 Bq) of removable contamination.
- Handling, storage, use, transfer, and disposal: In accordance with Section 31.5, 10 CFR Part 31 or equivalent regulations of an Agreement State.
- This registration sheet and the information contained within the references shall not be changed without the written consent of the NRC.

SAFETY ANALYSIS SUMMARY:

As of the effective date of this document, the Model PLG-2 devices are not current products manufactured by the Nuclear Research Corporation. Nuclear Research Corp. has indicated that they will no longer provide services for these devices. In addition, Nuclear Research Corp. indicated that a number of these devices have been replaced by similar model PLG-3 or PLG-4 devices.

REFERENCES:

The following supporting documents for the Model PLG-2 are hereby incorporated by reference and are made a part of this registry document.

- Nuclear Research Corporation's letters dated September 27, 1995, September 12, 1995, August 2, 1991, July 31, 1991, and July 25, 1969, with enclosures thereto.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-807-G DATE: September 28, 1995

DEVICE TYPE: Density Gauge

ISSUING AGENCY:

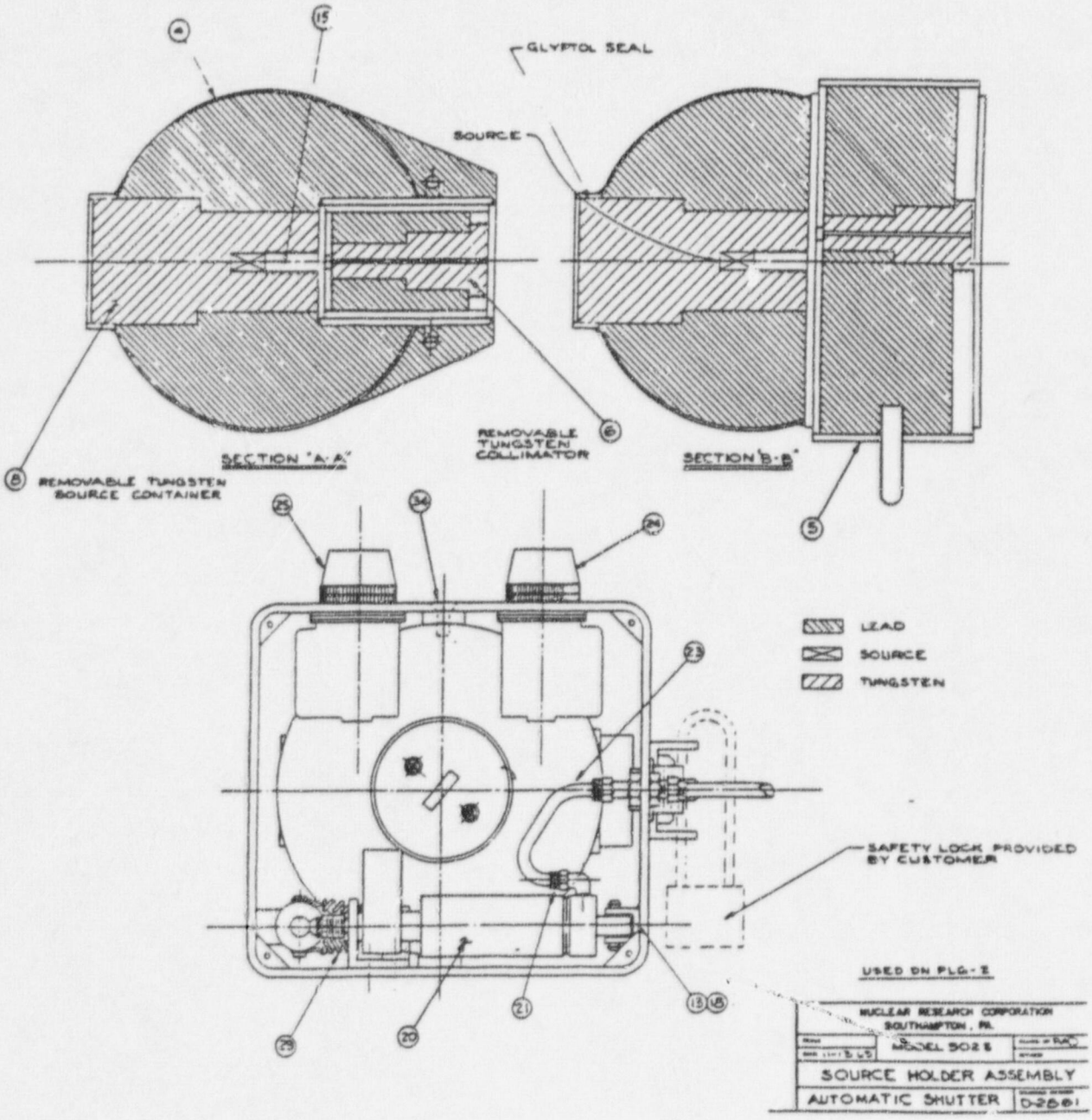
U.S. Nuclear Regulatory Commission

Date: September 28, 1995 Reviewer: Douglas A. Broaddus
Douglas A. Broaddus

Date: September 28, 1995 Concurrence:
Steven L. Baggett

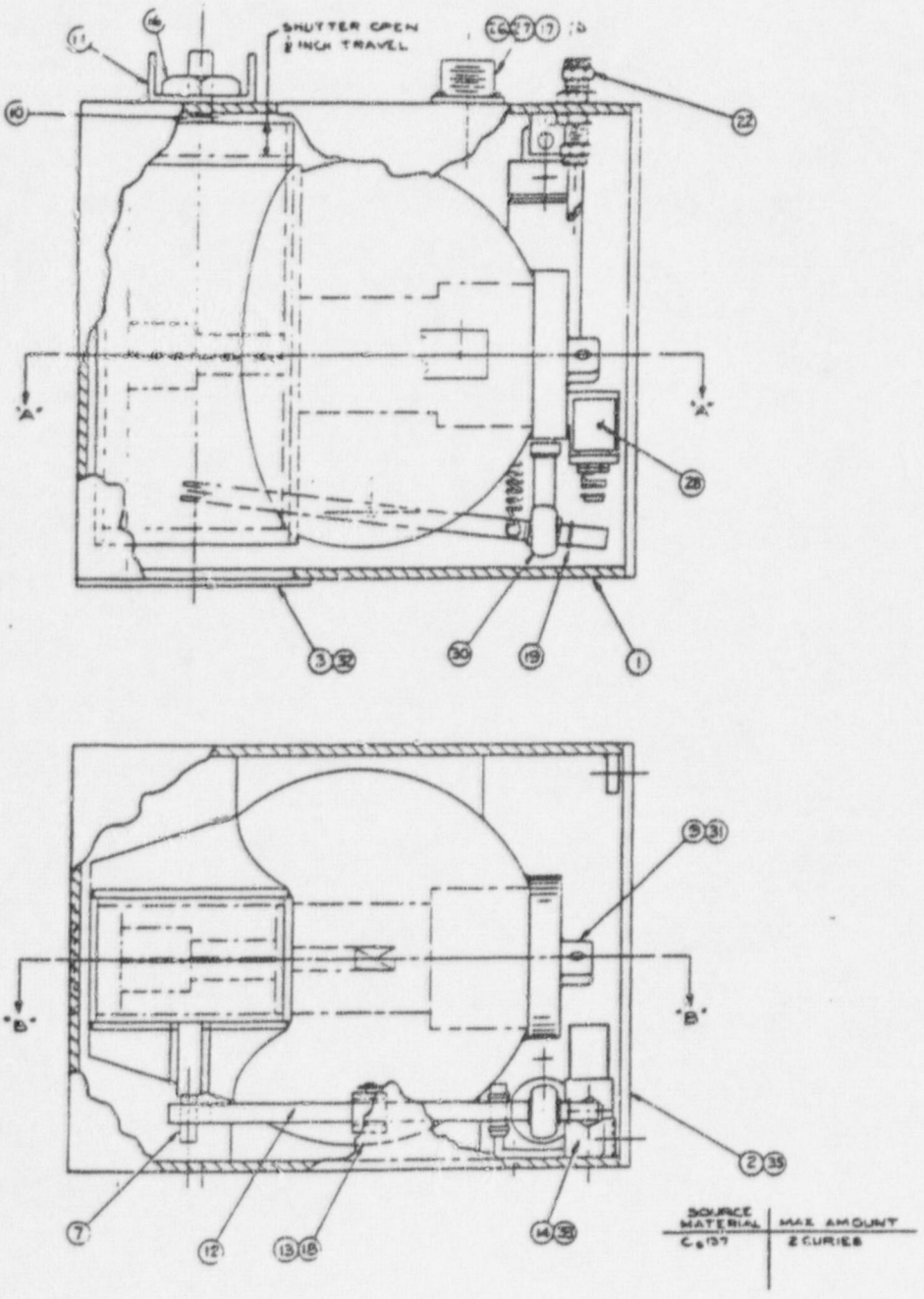
REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-807-G DATE: September 28, 1995 ATTACHMENT 1



REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-807-G DATE: September 28, 1995 ATTACHMENT 2



REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-803-S DATE: September 28, 1995

DEVICE TYPE: Source Holder

MODEL: S-4

MANUFACTURER/DISTRIBUTOR: Nuclear Research Corporation
125 Titus Avenue
Warrington, PA 18976

SEALED SOURCE MODEL DESIGNATION: Nuclear Research Corp. SC-9

ISOTOPE:

Cobalt-60

MAXIMUM ACTIVITY:

2.66 curies (98.4 GBq)

LEAK TEST FREQUENCY: 6 Months

PRINCIPAL USE: (D) Gamma Gauge

CUSTOM DEVICE: _____ YES ___X___ NO

~~GSH60135~~ 700

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

DEVICE TYPE: Source Holder

DESCRIPTION:

This source holder consists of a steel encased cylinder 12" (30.5 cm) in diameter and 14.4" (36.6 cm) in length. The rear 2.4" (6.1 cm) of the cylinder houses the shutter actuating mechanisms, therefore, only 12" of total length contributes to shielding. An earlier version of this source holder measured 9" (22.9 cm) x 12". The source holder is mounted into its respective device by means of a cylindrical clamping mechanism.

The Nuclear Research Corp. Model SC-9 source (Co-60 pellet, singly encapsulated in stainless steel with silver solder seal) is mounted at the center of the cylinder. The shutter, consisting of a small cylinder 3.3" (8.4 cm) in diameter by 5.3" (13.5 cm) in length, is mounted so as to rotate about 1" (2.5 cm) off center of the main shielding cylinder. A 0.25" (0.64 cm) hole about 1" off center of the shutter cylinder and extending through the cylinder, acts as a beam port and collimator. Rotation of the shutter cylinder to the "off" position shields the source.

"On" and "off" lights are mounted on the source holder and are actuated by an internally mounted microswitch. The shutter is operated electrically, by a rotary solenoid, from a remote location.

DIAGRAM:

See attachments 1-5.

LABELING:

The device is labeled "DANGER - RADIATION - RADIOACTIVE MATERIALS - COBALT 60," plus source description and a stated "safe working distance," in the proper colors.

CONDITIONS OF NORMAL USE:

The source holder was intended to be able to be installed in a variety of devices in a variety of industrial applications.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

DEVICE TYPE: Source Holder

PROTOTYPE TESTING:

These devices were manufactured and distributed under an Atomic Energy Commission specific license by the Nuclear Research Corporation since 1963. The manufacturer did not supply prototype testing for these devices, but rather, relied on the design, construction, and material selection for assurance of the integrity of the device.

EXTERNAL RADIATION LEVELS:

The manufacturer provided a radiation profile of the source holder containing the maximum activity in the "off" position. This profile indicates a maximum radiation level of approximately 9 mR/hr (0.9 mSv) at 12" from the device.

QUALITY ASSURANCE AND CONTROL:

Nuclear Research Corporation did not supply quality assurance and control information for these devices. The devices were approved for distribution by Nuclear Research Corp under an Atomic Energy Commission specific license in 1963.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- The source holder is to be used only by persons specifically licensed by the NRC or an Agreement State.
- Handling, storage, use, transfer, and disposal: To be determined by the licensing authority.
- The source holder shall be leak tested at intervals not to exceed 6 months using techniques capable of detecting 0.005 microcurie (185 Bq) of removable contamination.
- This registration sheet and the information contained within the references shall not be changed without the written consent of the NRC.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-803-S DATE: September 28, 1995

DEVICE TYPE: Source Holder

SAFETY ANALYSIS SUMMARY:

Since the effective date of this document, the Model SC-4 source holders are not current products manufactured by the Nuclear Research Corporation. Nuclear Research Corp. has indicated that they will no longer provide service support for these devices.

REFERENCES:

The following supporting documents for the Model SC-4 are hereby incorporated by reference and are made a part of this registry document.

- Nuclear Research Corporation's letters dated September 27, 1995, September 12, 1995, August 2, 1991, July 31, 1991, and January 21, 1957, and December 17, 1956, with enclosures thereto.

ISSUING AGENCY:

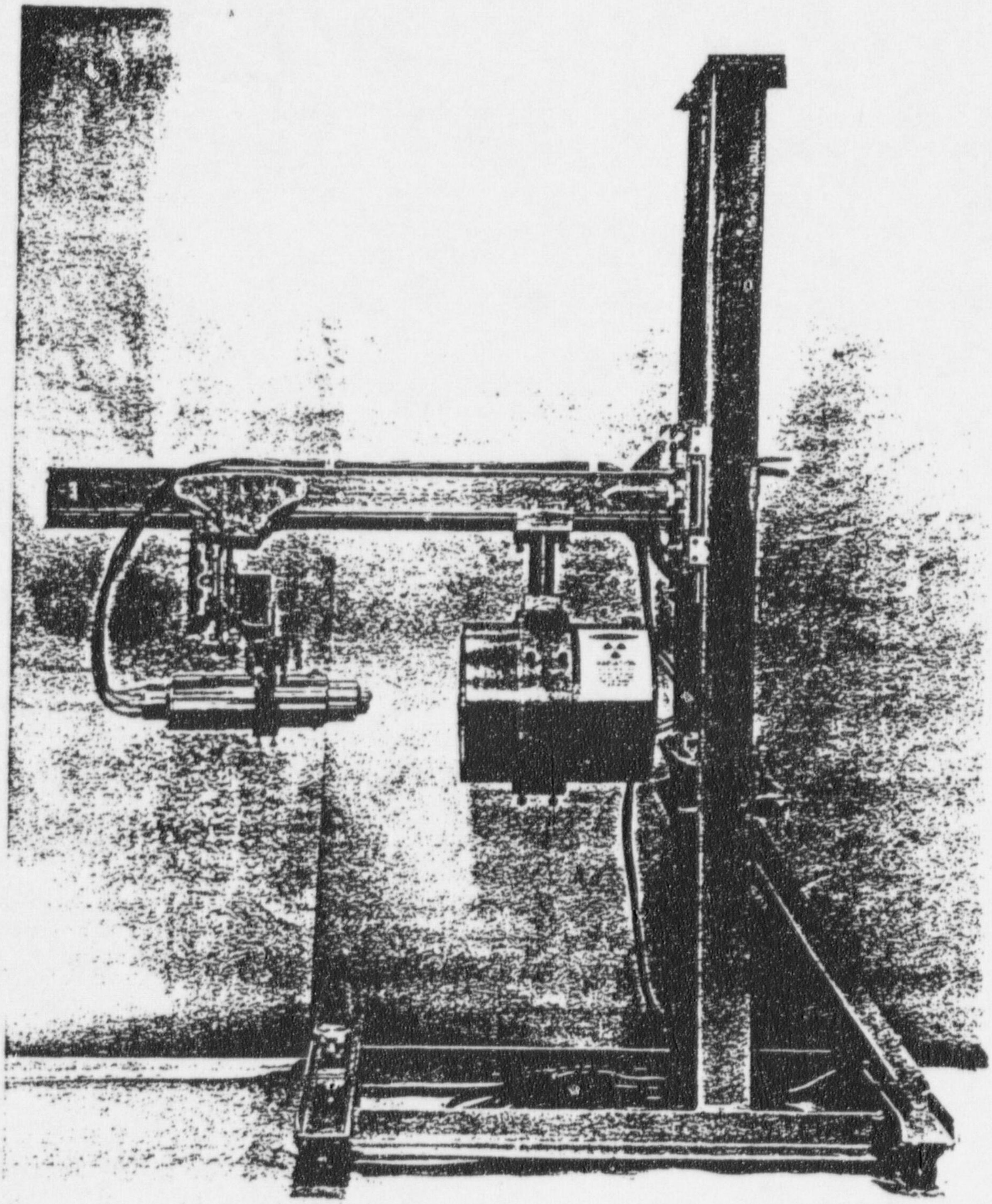
U.S. Nuclear Regulatory Commission

Date: September 28, 1995 Reviewer: Douglas A. Broaddus

Date: September 28, 1995 Concurrence: Steven L. Baggett

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

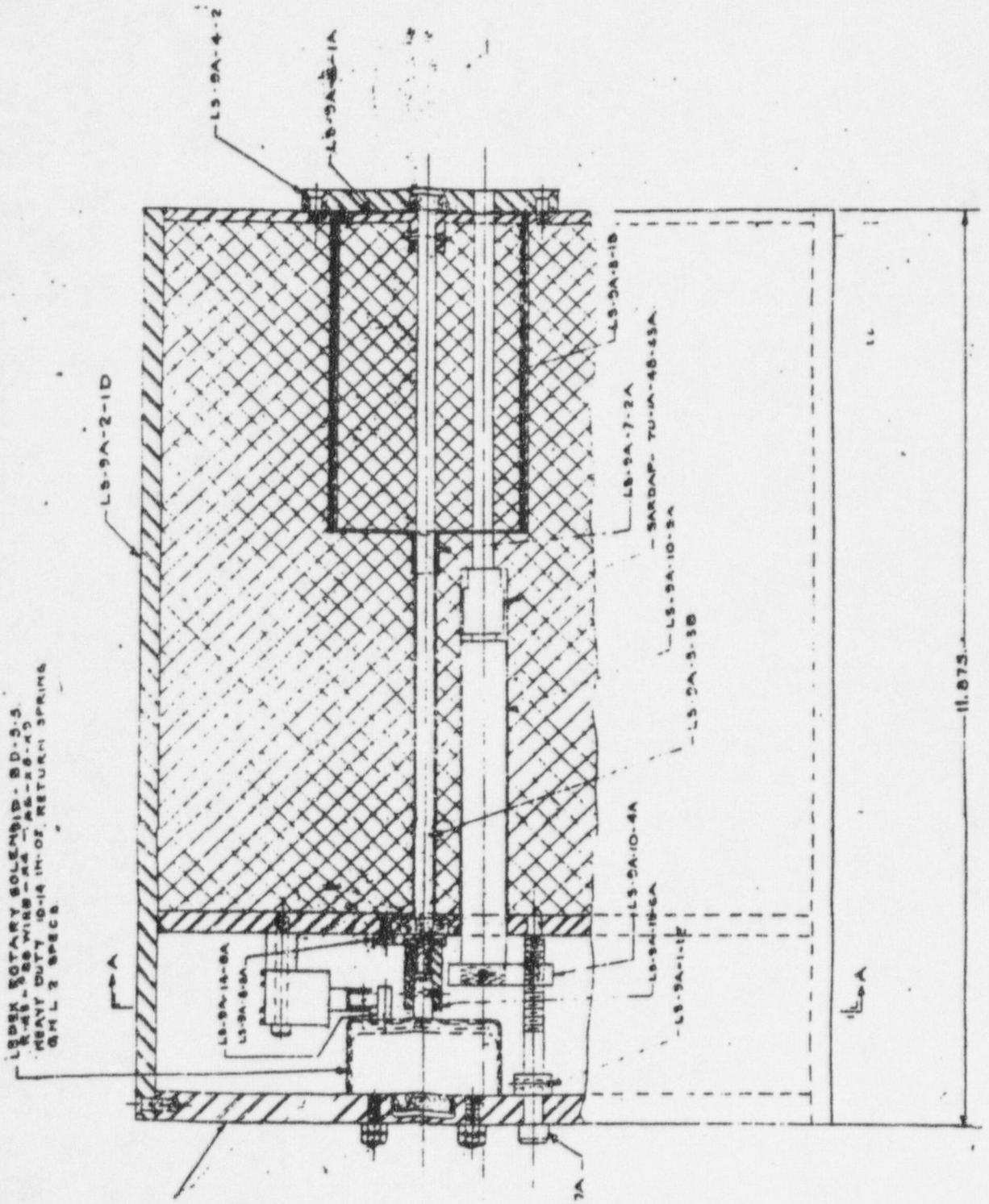
<u>NO.:</u> NR-504-D-803-S   <u>DATE:</u> September 28, 1995   <u>ATTACHMENT 1</u>



SOURCE HOLDER NO. 4S-13B , S-4 SOURCE HOLDER , EQUIPMENT NO. & MODEL TU-1E

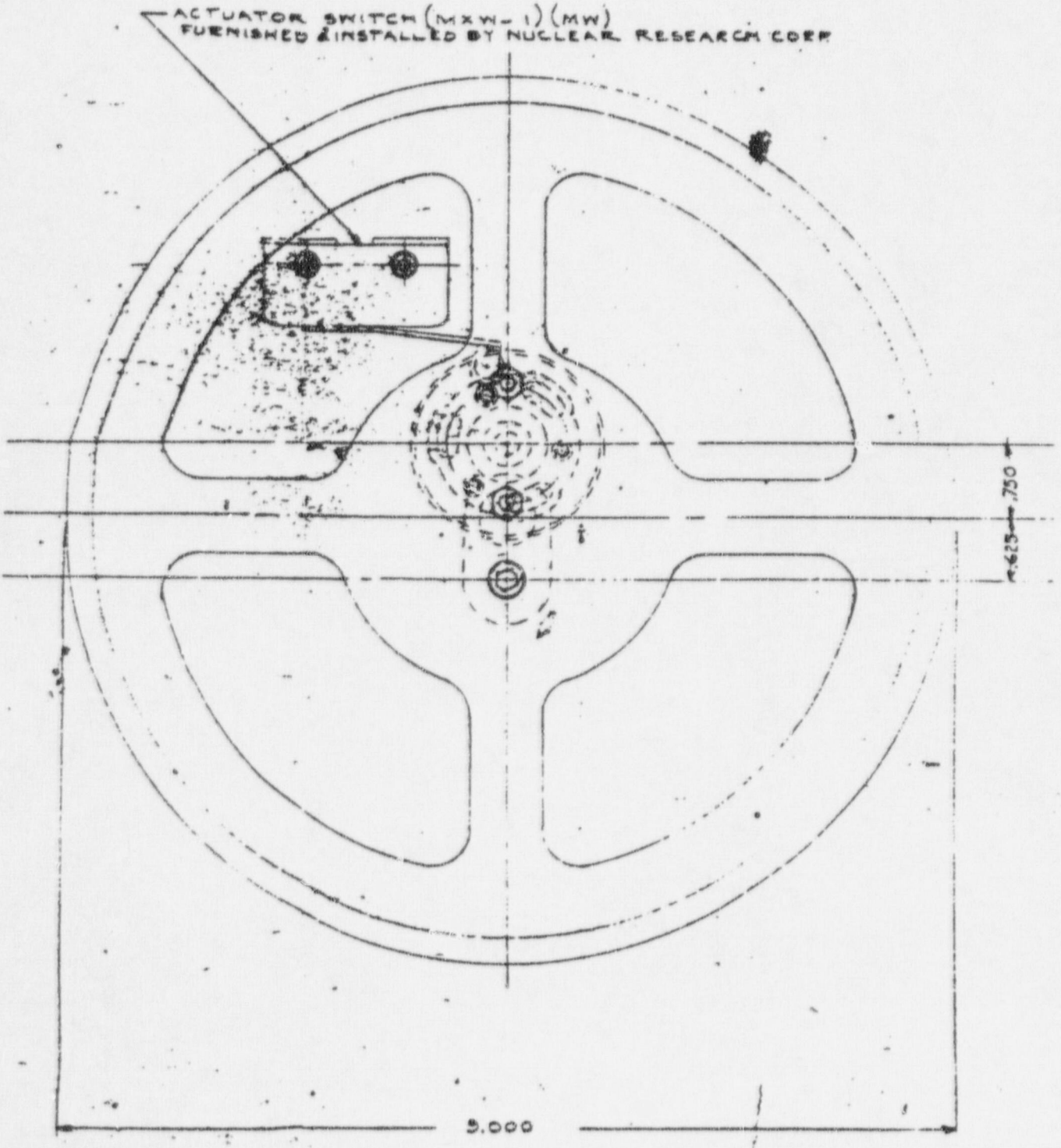
REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-803-S DATE: September 28, 1995 ATTACHMENT 2



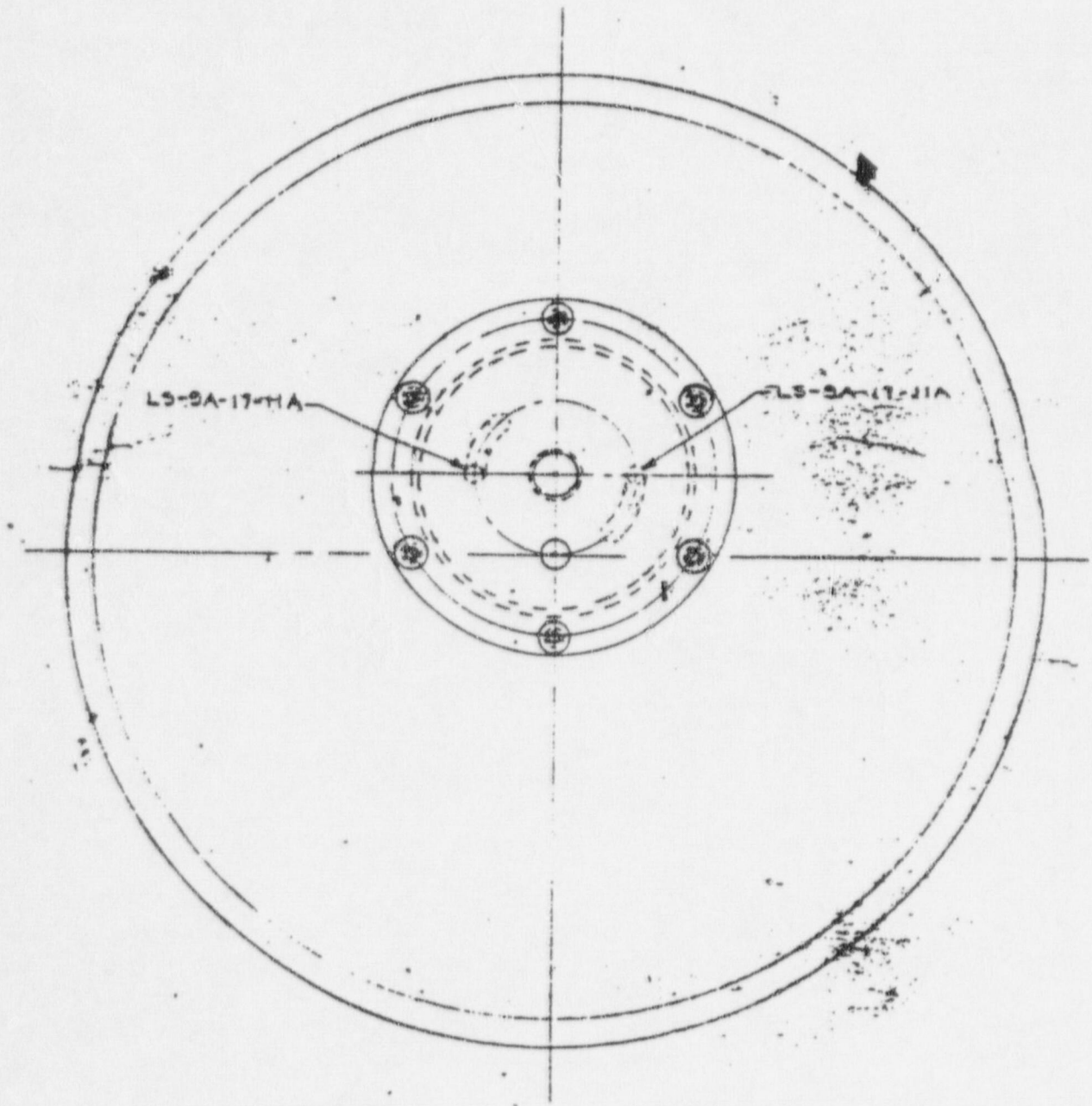
REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-803-S DATE: September 28, 1995 ATTACHMENT 3



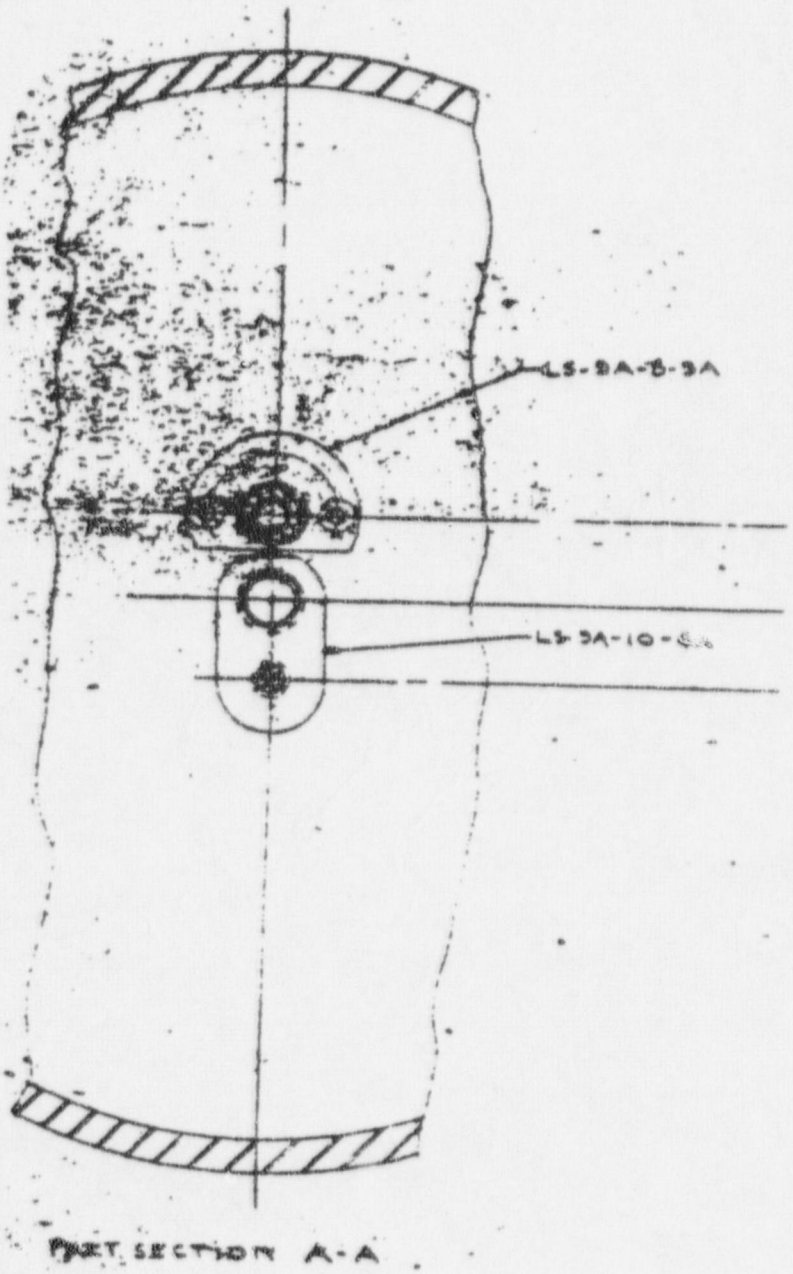
REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-803-S DATE: September 28, 1995 ATTACHMENT 4



REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-504-D-803-S DATE: September 28, 1995 ATTACHMENT 5



PART SECTION A-A