

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NR-198-D-101-E

DATE: FEB 26 1985

PAGE 1 OF 1

DEVICE TYPE: Smoke Detector

MODEL: 82 Series

MANUFACTURER/DISTRIBUTOR:

Cable Electric Products, Inc.
234 Daboll Street
Providence, RI 02940
(401) 781-5400

SEALED SOURCE MODEL DESIGNATION:

NRD, Inc. Model A001
ION Chambers - Nemote Co. (Model N15-09)
Tokyo, Japan

ISOTOPE: Americium-241

MAXIMUM ACTIVITY: 0.9 (+ 0.09) microcuries/unit

LEAK TEST FREQUENCY: Not required

PRINCIPAL USE: (P) Ion Generator, Smoke Detectors

CUSTOM DEVICE: ☐ YES ☒ NO

ISSUING AGENCY:

U. S. Nuclear Regulatory Commission

DATE: February 26, 1985

REVIEWER:

Sterling W. Bell

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NR-271-D-101-E

DATE: FEB 26 1985

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DEVICE TYPE: Smoke Detector

MODEL: 305 -series

(Model series sold under various brand names which may have different plastic housings.)

MANUFACTURER/DISTRIBUTOR:

G. S. Edwards
Main Street
Pittsfield, Maine 04967
(207) 487-3104

SEALED SOURCE MODEL DESIGNATION: Amersham Corporation Models AMM-1001 and AMM

NRD Model A-001

EAD Model AMX-1100

ISOTOPE: Americium-241

MAXIMUM ACTIVITY: $0.5 \pm .05$ $\mu\text{Ci/unit}$

LEAK TEST FREQUENCY: Not required

PRINCIPAL USE: (P) Ion Generators, Smoke Detectors

CUSTOM DEVICE: ☐ YES ☒ NO

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

DATE: February 26, 1985

Reviewer:

Sterling W. Bell
Sterling W. Bell

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: TX²⁹³D101S

DATE: November 21, 1984

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DEVICE TYPE: Neutron Backscatter Level Detector

MODEL: LD2220

MANUFACTURER/DISTRIBUTOR: Fisher Controls
Highway 380 East
P. O. Box 900
McKinney, Texas 75069

SEALED SOURCE MODEL DESIGNATION: Gammatron Inc. Model AN-HP

ISOTOPE: Am-241

MAXIMUM ACTIVITY: 200 mCi.

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: General Neutron Source Applications

CUSTOM DEVICE: _____ YES _____ X NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: TX~~293~~ D101S

DATE: November 21, 1984

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DEVICE TYPE: Neutron Backscatter Level Detector

DESCRIPTION: The Model LD2220 neutron backscatter level detector is composed of a helium-3 neutron detector mounted beside a source holder containing an Am-241 neutron source of 200 millicuries. This assembly is mounted on a five foot long aluminum tube. A Ludlum Measurements Inc. Model 12 rate meter is mounted at the other end of the tube.

LABELING: A label containing the standard "Caution - Radioactive Material" and radiation trefoil is attached to the source-detector assembly. This label also contains the source serial number, radionuclide activity and date of measurement with a "Notify Civil Authorities" on the outside edge of the label. Another label with the company name and serial number of the device is also attached.

DIAGRAM:

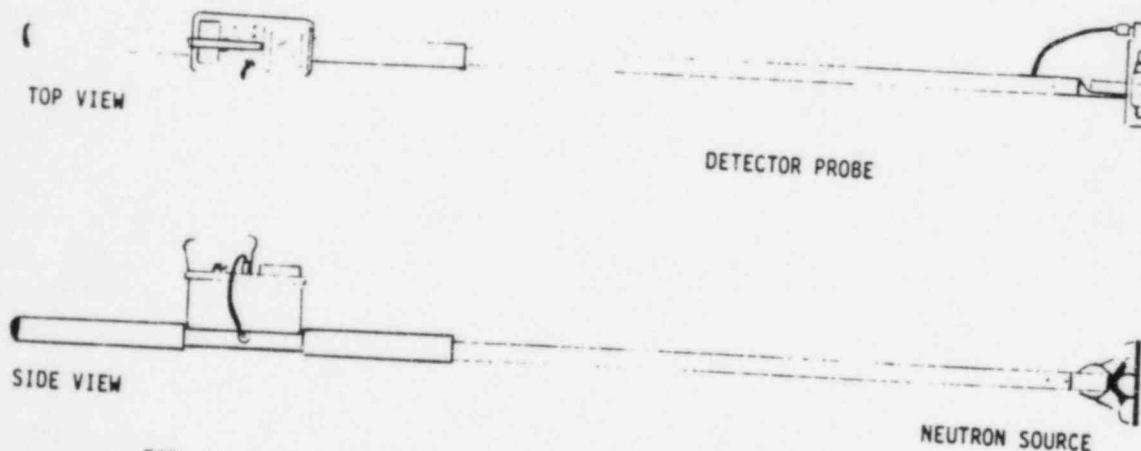


FIG. 1 - Model LD2220 Neutron Backscatter Level Detector

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DEVICE TYPE: Neutron Backscatter Level Detector

CONDITIONS OF NORMAL USE: The Model LD2220 is intended for use in determining liquid levels inside chemical process equipment. The device is portable and must be used in environments compatible with man. The source-detector assembly is manipulated at the handle end of the device, four and one-half feet from the source-detector assembly. This device will normally be operated using only a 100 millicurie Am(Be) source. However, 200 millicurie sources may be used. This may occur if vessel walls are thick, thick insulation is present around the vessel or materials inside the vessel are low in hydrogen content.

In general, the device will be removed from storage, taken into the plant, and used by trained operating personnel who have been instructed in the safe use and proper handling of the device by the Radiation Safety Officer. The actual period of use expected is 10 minutes to one hour per week. After use, the device is returned to storage.

If severe conditions occur (explosion or fire), the device will likely be destroyed. However, the Am(Be) sources should remain intact since these sources are designed to perform under a pressure of 25,000 pounds per square inch and a temperature of 600 centigrade for one hour.

PROTOTYPE TESTING: Several prototypes were tested. Device construction causes the operator to maintain a safe distance from the source in order to operate the device.

EXTERNAL RADIATION LEVELS: Radiation levels at one foot from the source holder with a 200 millicurie source are 1.28 millirem/hr. of gamma radiation and 8.57 millirem/hr. of neutrons. Each 200 millicurie source is expected to produce 5.74×10^5 neutrons per second.

QUALITY ASSURANCE AND CONTROL: The device is completely assembled and tested before the sealed source(s) is installed. Each sealed source is certified as to specific activity and neutron output. Each device is then tested for proper operation before release.

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NO: TX²⁹³D101S

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DEVICE TYPE: Neutron Backscatter Level Detector

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

1. These devices may be distributed to specifically licensed users only.
2. Leak testing of the sealed source is required at six month intervals.
3. Repair and maintenance will be provided. Any repair involving the source housing will be handled by N.S.S.I. in Houston, Texas.
4. Source exchanges, if necessary, will be performed by N.S.S.I. in Houston, Texas.
5. The device will be returned to N.S.S.I. for disposal.
6. Training to safely use this device is provided to the Radiation Safety Officer. The Radiation Safety Officer may then present a short orientation course to qualify technicians as users.

SAFETY ANALYSIS SUMMARY: This device can be operated safely by trained personnel. However, the possibility of misuse exists and only trained and competent personnel should be allowed to have access.

REFERENCES: Application dated November 5, 1984 with procedures, accompanying data and drawings.

DATE: November 21, 1984

REVIEWED BY: Boyd R. Hunter

DATE: December 4, 1984

REVIEWED BY: John E. Goull

ISSUING AGENCY: Texas Department of Health

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: TX333D115S

DATE: September 12, 1984

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DEVICE TYPE: Panoramic Radiographic Exposure Device

MODEL: 20V, 20VS

MANUFACTURER/DISTRIBUTOR: Gulf Nuclear, Inc.
202 Medical Center Blvd.
Webster, Texas 77598

SEALED SOURCE MODEL DESIGNATION: Gulf Nuclear Model RG-13

ISOTOPE: Iridium-192
Depleted
Uranium

MAXIMUM ACTIVITY: 100 Curies
Shielding, 13.6
kilograms

LEAK TEST FREQUENCY:

PRINCIPAL USE: Industrial Radiography

CUSTOM DEVICE: _____ YES _____ X _____ NO

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REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: TX333D115S

DATE: September 12, 1984

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DEVICE TYPE: Panoramic Radiographic Exposure Device

DESCRIPTION:

The Model 20V consists of a 30 pound depleted uranium shield mounted in epoxy around a zircaloy "S" tube and enclosed in a rectangular aluminum case with overall dimensions of about 6" x 5" x 10". The device is a crank out type of device which drives the source to and from the shielded position. The drive cable connector, exposure tube connector, and the crank assembly are made of stainless steel. The exposure tube is plastic with brass fittings and is 22 feet long. The Model 20VS is identical to the 20V, except that the 20VS is enclosed in a rectangular stainless steel case and is certified as a Type B transport container. The Model 20V and 20VS uses the manufacturer's Model RG-13 source and is compatible with either the NEEI RC-6C or NEEI U-110 source changer.

LABELING:

The device bears the manufacturer's name, model, number, serial number, radiation symbol, isotope, number of curies, date, "CAUTION RADIOACTIVE MATERIAL", and specifies the device contains 30 pounds of uranium. Source data is contained on a removable label which is provided with each new source.

EXTERNAL RADIATION LEVELS:

The highest radiation level about the device at a distance of six inches from the surface was measured to be 32 millirem per hour for a 100 curie source.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

The manufacturer provides an instruction manual of operation for the device and states that all repairs of the device are to be performed by the manufacturer.

DATE: September 12, 1984

REVIEWED BY: Raymond K. Hunter

DATE: 12 Sept, 1984

REVIEWED BY: Joseph G. Blumstein

ISSUING AGENCY: Texas Department of Health

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: TN-391-D-101-G

DATE: March 1, 1985

PAGE: 1 of 5

DEVICE TYPE: Fill Level Gauge

MODEL: Model 150

MANUFACTURER/DISTRIBUTOR:

Industrial Services and Supply Co., Inc.
2322 Carrollwood Lane
Cordova, TN 38018

MANUFACTURER/DISTRIBUTOR:

SEALED SOURCE MODEL DESIGNATE: Amersham Model A.MC.25

ISOTOPE: Americium-241

MAXIMUM ACTIVITY: 50 millicuries

LEAK TEST FREQUENCY: 6 month intervals

PRINCIPAL USE: Gamma Gauge

CUSTOM SOURCE: ☐ YES ☒ NO

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE**

NO.: TN-391-D-101-G

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DEVICE TYPE: Fill Level Gauge

DESCRIPTION:

The gauge is comprised of the shielded beam source and an analyzer target mounted in an inverted "U" shaped housing. The beam source is mounted in one leg with the beam aimed at the opposite leg. In the opposing leg an analyzer is mounted to receive the incident beam. The unit is designed so that the analyzer target intercepts the entire beam diameter emitted from the source, thus providing shielding in the direction of the beam.

The radiation-source-holder consists of a lead tube of 2 mm wall thickness which immediately surrounds the source capsule. This tube is open on one end which confines the dispersion of the beam and directs it. The opposite end of the tube is closed with a lead cap plug that provides shielding in the opposite direction of the beam and serves as the locking device that holds the source capsule securely in the holder. Surrounding the lead tube is a brass block that serves as the main structure support for the source and the lead shield.

The exit end of the source holder is bolted to a vertical brass plate of 2 mm thickness which serves as the bracket for mounting to the 2 mm thick stainless steel instrument housing.

A 1 mm thick stainless steel shutter covers the exit hole of the source holder in the "off" or "safe" condition. The shutter mechanism is designed as a fail-safe device. It is spring loaded in the closed position and opened by means of a solenoid. The shutter is only open when power is applied to the gauge. When the electrical power is removed, the shutter is automatically closed. On the back side of the instrument housing there is a viewing window that exposes a flag which is connected to the shutter. By this means, the position of the shutter is verified.

The radiation-source-holder is housed within the inspection head. The inspection head comprises a 2 mm thick stainless steel housing which surrounds the radiation-source-holder. Access to the radiation-source-holder is controlled by fasteners that require tools for removal. Access is accomplished by removing three acorn-type cap nuts from the removable cover of the inspection head. Inside the inspection head the radiation-source-holder is held in place by another set of fasteners.

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE**

NO.: TN-391-D-101-G

DATE: March 1, 1985

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DEVICE TYPE: Fill Level Gauge

LABELING:

- A. Each device shall be provided with a label containing information as follows:
- (1) The receipt, possession, use, and transfer of this device, model number 150, serial number _____, are subject to a general license or the equivalent and the regulations of the U. S. Nuclear Regulatory Commission or a State with which the N.R.C. has entered into an agreement for the exercise of regulatory authority. (The model and serial number may be omitted from this statement provided they are elsewhere specified in labeling affixed to the device.)
 - (2) Abandonment or disposal prohibited unless transferred to persons specifically licensed by the U. S. Nuclear Regulatory Commission or an Agreement State.
 - (3) Operation prohibited if there is indication of failure of, or damage to, radioactive material contained or ON-OFF mechanism or indicator.
 - (4) Device shall be tested for leakage of radioactive material and for proper functioning of the ON-OFF mechanism at the time of installation, replacement of the radioactive material, and thereafter at no longer than 6 month intervals.
 - (5) Installation, dismantling, relocation, maintenance, or tests shall be performed by persons specifically licensed by the U. S. Nuclear Regulatory Commission or an Agreement State.
- B. Each device shall be provided with a label containing the radiation symbol in conventional colors, magenta or purple on yellow background, the words "CAUTION (or DANGER) - RADIOACTIVE MATERIAL", the identity and quantity of radioactive material and its date of measurement, and the name of the distributor of the device.
- C. Each label required by items (A) and (B) of above shall contain a statement "Removal of this label is prohibited".

PROTOTYPE TESTING:

Gauge - ANSI N538-1979 classification 33-985-985-R-3
Source Capsule - ANSI N5.10-1968 classification C64444

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE**

NO.: TN-391-D-101-G

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DEVICE TYPE: Fill Level Gauge

EXTERNAL RADIATION LEVELS:

With the exception of within the useful beam, the exposure rate around the inspection head is less than 0.075 inrem/hour measured at a 10 cm radius from the surface of the inspection head. At 100 cm radius from the surface of the inspection head the exposure rate is less than 0.05 inrem/hour.

The useful beam is shielded completely by the opposite arm of the inspection head.

QUALITY ASSURANCE AND CONTROL:

The device without radioactive source is manufactured by Krones, Inc., of Franklin, WI.

Industrial Services and Supply Company, Inc., will be responsible for:

- Determining if the device has been manufactured properly;
- Loading of the source at the licensee's facility;
- Performing tests for removable contamination;
- Verifying proper operation of the shutter;
- Verifying proper operation of the device as a whole; and
- Performing an initial radiation survey of the device.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- o A copy of the Checkmat 150 "Operations and Maintenance Manual," must be supplied by Industrial Services and Supply Company, Inc., prior to use. (Manual will include: copy of General License, copy of pertinent state regulations, etc.)
- o Loading of the Checkmat 150 with the radioactive source must be performed by Industrial Services and Supply Company, Inc.
- o This device shall be received, acquired, owned, possessed, used, and transferred in accordance with the general license provisions of 1200-2-10-.10 of "State Regulations for Protection Against Radiation" or equivalent U. S. Nuclear Regulatory Commission or Agreement State regulations.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: TN-391-D-101-G

DATE: March 1, 1985

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DEVICE TYPE: Fill Level Gauge

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE: (Cont.)

- ° The device shall be leak tested at six month intervals using techniques capable of detecting .005 microcurie of removable contamination.

SAFETY ANALYSIS SUMMARY:

Based on our review of these facts and the information contained in the references cited below, we conclude the device design is acceptable for general licensing purposes. Furthermore, we conclude that the device is likely to retain containment of the radioactive contents under foreseeable conditions of use which might occur during uses specified in this certificate.

REFERENCES:

License application dated December 17, 1984, with attachments, (as amended January 14, 1985).

Letter dated February 4, 1985 with attachments.

Letter dated February 1, 1985 from Krones, Inc.

Krones Checkmat 150 Operation and Maintenance Manual

ISSUING AGENCY:

Tennessee Division of Radiological Health

DATE: 3/1/85

DATE: 3/1/85

REVIEWED BY: Roger J. Jones

CONCURRENCE: James L. Graves

RFF/bjs/DRH/Hold 7
Fill Level Gar/

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO: NR-470-S-101-S

DATE: SEP 27 1984

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SOURCE TYPE: Neutron Reference Source

MODEL: C2106-AB00, C2106-AC00

DISTRIBUTOR: U.S. Department of the Navy
Naval Electronics Systems Command
Washington, DC 20360

MANUFACTURER: Monsanto Company
Dayton Laboratories
1515 Nicholas Road
P.O. Box 8, Station B

ISOTOPE:

Americium-241: BE

MAXIMUM ACTIVITY:

2.5 curies (C2106-AB00)
0.06 curies (C2106-AC00)

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: (H) General Neutron Source applications

CUSTOM SOURCE: ☒ YES ☐ NO

U.S. DEPARTMENT OF THE NAVY

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REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO: NR-470-S-101-S

DATE: SEP 27 1984

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DESCRIPTION:

The custom sources are doubly encapsulated and fabricated using 304 stainless steel. Each capsule is sealed by arc welding. The source is designed to allow attachment of a cable assembly. This allows the source to be drawn through a tube that passes by counting equipment on Naval ships. The technicians can determine if the counting equipment and related circuitry is operating properly by using this method. The source is normally locked in the tube when not in use.

The source models C2106-AB00 and C2106-AC00 are similar in construction, the only difference being that the AB00 has 2.5 curies, the AC00 source has 0.06 curies and is assembled using Monsanto's new welding methodology.

LABELING:

The outer capsule is electro-etched with the radiation trefoil symbol, the words, "Caution Radioactive Material", the isotope and activity date, assay and unique serial number.

DIAGRAM:

See Attachment I

CONDITION OF NORMAL USE:

The source is used by trained personnel to stimulate counting equipment and to test the circuitry and operability of counting equipment aboard Naval ships. The source is normally protected from the severe environs associated with open sea travel.

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SAFETY EVALUATION OF SOURCE

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DATE:

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PROTOTYPE TESTING:

The Navy reports the sources are very similar in construction as the Monsanto Model 2720 series source. The Monsanto ANSI classification for this source is 68E64525. The Navy source does not have an ANSI classification. However, the Navy reported the source design was subjected to the following conditions.

- 0 Immersion in water
- 0 Immersion in air
- 0 Free dropped from a height of 30 feet
- 0 Impact tested during a 3 pound hammer from a height of 3 feet
- 0 Heat tested in 1475°F

EXTERNAL RADFRACTION LEVELS:

The Navy reports a total dose rate (gamma + neutron) for a 0.06 curies source of:

Centimeter	mrem/hr
5	≈ 79
30	≈ 2.2
100	≈ 0.2

QUALITY ASSURANCE AND CONTROL:

A quality assurance program is not required for custom sources. They are to be built to the unique engineering specification of the user. However, the source manufacturer was a QA program that has been previously deemed acceptable for licensing purposes by the Nuclear Regulatory Commission.

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SAFETY EVALUATION OF SOURCE

NO: NR-470-S-101-S

DATE:

SEP 27 1964

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LIMITATION AND/OR OTHER CONSIDERATIONS OF USE:

- 0 The sources shall be distributed only to the specific licensee referred to in this document (US Department of the Navy)
- 0 The source shall be leak tested at 6 month intervals using techniques capable of detecting 0.005 microcurie of removable contaminations.
- 0 Handling, storage, use, transfer, and disposal to be determine by the licensing authority.
- 0 This registration sheet and the information contained within the references shall not be changed or transferred without the written consent of the Nuclear Regulatory Commission.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information and test data cited below, that the source is equivalent to the neutron source previously deemed acceptable for licensing, we conclude that the source design in this document are acceptable for custom licensing purposes.

Furthermore, we conclude that the sources would be expected to maintain their containment integrity for normal conditions of uses as specified in this certificate.

REFERENCES:

The following supporting documents for the source design are hereby incorporated by reference and are made a part of this registry document.

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REFERENCE (Cont'd):

U.S. Department of the Navy letters
dated September 2, 1982, October 7, 1981
and June 14, 1984 with enclosures thereto

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: _____

Reviewer: _____

Date: _____

Concurrence: _____

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

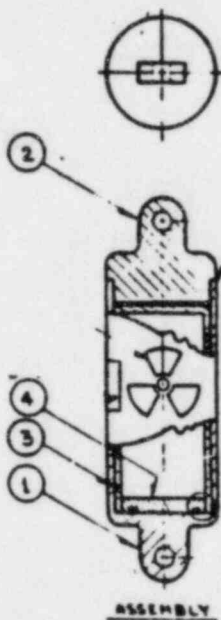
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ATTACHMENT 1

Generic Source Design SEP 27 1984

PC NO.	NAME
1	BODY
2	CAP
3	CONTAINER
4	PLUG



← Example of Label

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NO: NR-476-S-145-S

DATE: OCT 1 8 1982

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DEVICE TYPE: Beta Source

MODEL: NER-8180

MANUFACTURER/DISTRIBUTOR:

New England Nuclear Company
601 Treble Cove Road
North Billerica, MA 01862

MANUFACTURER/DISTRIBUTOR:

ISOTOPE: Krypton-85

MAXIMUM ACTIVITY: 1150 millicuries

LEAK TEST FREQUENCY: Not Required

PRINCIPAL USE: (E) Beta Gauging

CUSTOM DEVICE: ☐ YES ☒ NO

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DEVICE TYPE: Beta Source

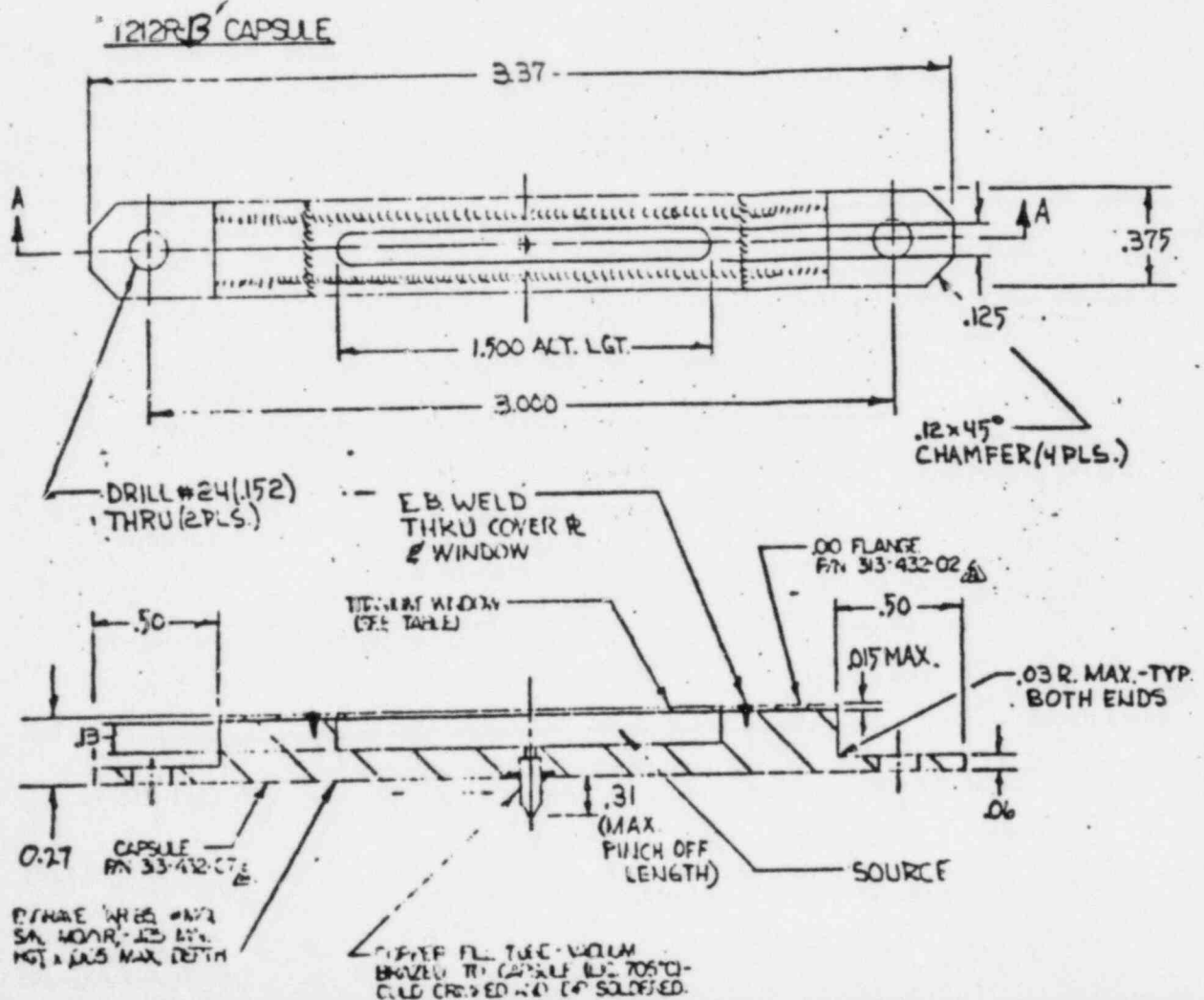
DESCRIPTION:

The source capsule is made of commercial pure titanium and is 3.4" long x 0.37" wide x 0.27" high and weighs approximately 20 grams. The active cavity for the Krypton-85 gas is 1 1/2" long by 1/8" wide with a volume of 0.45 cc. The front of the source is covered by a 2 mil. thick titanium window welded in place. The Krypton-85 gas is introduced into the source cavity via a copper fill tube which is vacuum brazed to the back of the source. When filled with gas, the fill tube is crimped shut and dip soldered to effect a seal (see diagram).

LABELING:

Each source is engraved with "KR-85," the millicuries, serial number and the month/year. In addition, each source is shipped with a final data package which includes "Certificate of Sealed Source Tests," "Radiation Safety and Instructions Sheet," and a technical data sheet reporting: (a) capsule content activity value in curies, (b) beta emission, (c) Krypton-85 gas enrichment used and, (d) capsule internal specific

DIAGRAM:



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DEVICE TYPE: Beta Source

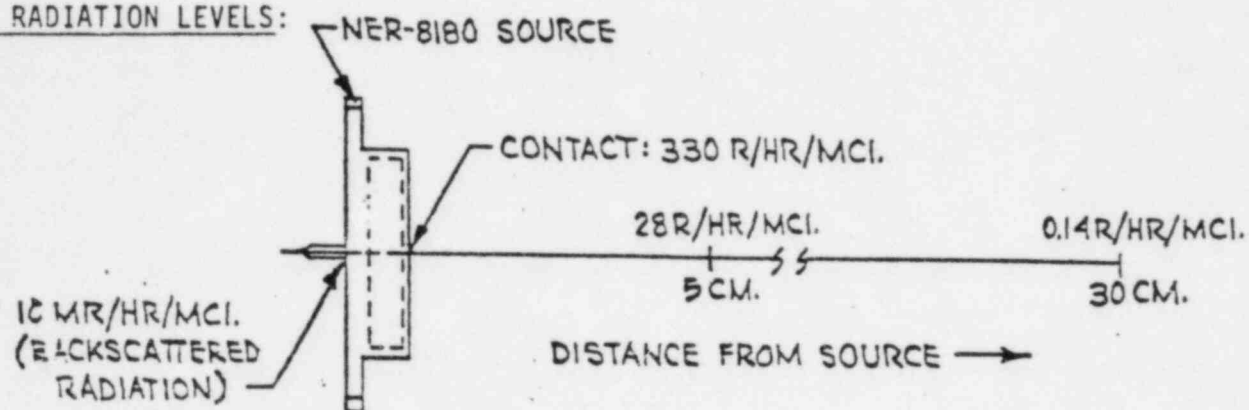
CONDITIONS OF NORMAL USE:

The Model NER-8180 Krypton-85 source is intended for use in industrial beta gauging applications wherein it will be secured in a shielded and shuttered holder bearing required identification and warning labels. It is not expected to be subjected to temperatures above 70°C or an external pressure greater than 30 psia.

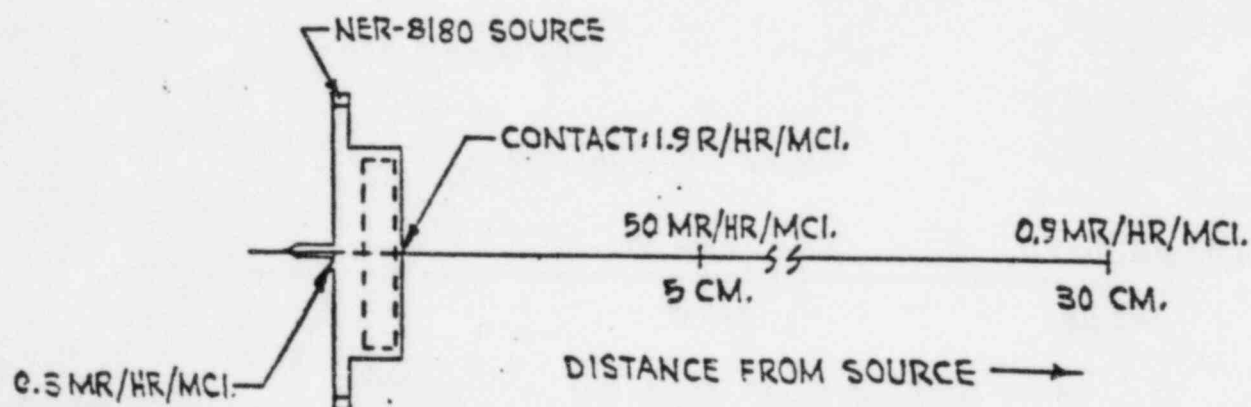
PROTOTYPE TESTING:

Two prototype sources were tested by New England Nuclear and the reported environmental testing results of the NER-8180 line source indicates qualification pursuant to ANSI N542-1977 requirements for performance classification 77C33322.

EXTERNAL RADIATION LEVELS:



BETA RADIATION SURVEY



GAMMA RADIATION SURVEY

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DEVICE TYPE: Beta Source

EXTERNAL RADIATION LEVELS (Cont'd):

NOTES

1. Beta radiation dose rates are measured with a survey meter thru an aluminized mylar window which is less than 7 mg/cm^2 thick.
2. Gamma radiation dose rates are measured with a survey meter thru a plastic window which is 500 mg/cm^2 thick and filters all the beta radiation.
3. The survey meter is calibrated to $\pm 15\%$ and the test sources contain $\sim 5 \text{ mCi}$ Kr-85.

QUALITY ASSURANCE AND CONTROL:

New England Nuclear has described an acceptable quality assurance program consisting of the following basic components:

- ° Design control
- ° Procurement control
- ° Process quality control including content activity measurement, contamination/leakage testing, physical dimensions, and visual inspection.
- ° Final acceptance and records

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- A. This source shall be distributed only to specific licensees of the NRC or Agreement States.
- B. Handling, storage, use, transfer, and disposal: To be determined by the licensing authority.
- C. This source shall not be subjected to environmental or other conditions of use which exceed the American National Standards Institute (ANSI N542-1977) Classification of 77C33322.
- D. This source shall be used and/or stored in devices and/or shields which are labeled in accordance with the requirements of Section 20.203, 10 CFR 20 or equivalent Agreement State regulations.

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DEVICE TYPE: Beta Source

SAFETY SUMMARY EVALUATION:

Based on the prototype tests, the claimed ANSI source classification and the stated quality assurance and control program to be carried out by the manufacturer, it is our conclusion that the Model NER-1880 source is acceptable for licensing purposes. Furthermore, when used in properly designed shielded and shuttered holders by specific licensees who are required to train and equip their personnel to safely handle and mount the sources and guard against the high beta radiation exposure, it appears unlikely that persons would be exposed to limits in excess of those specified in 10 CFR 20.

REFERENCES:

The following supporting documents for the Model NER-8180 beta radiation line source are hereby incorporated by reference and are made a part of this registry document:

- ° New England Nuclear Corporation letters with attachments dated November 13, 1981 and October 5, 1982.
- ° Supersede NRC registry document dated January 29, 1982.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

OCT 18 1982

Date: _____

OCT 18 1982

Date: _____

Reviewer: _____

Concurrence: _____

Joseph M. Brown, Jr.
Nathan Basain

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SOURCE TYPE: Beta Gas Source

MODEL: NER-588

MANUFACTURER/DISTRIBUTOR:

New England Nuclear
A DuPont Company
331 Trouble Road
North Billerica, MA 01862

ISOTOPE:

Maximum Activity:

Krypton-85

2500 millicuries

LEAK TEST FREQUENCY: Not Required

PRINCIPAL USE: (E) Beta Gauges

CUSTOM SOURCE: _____ YES _____ ☒ X _____ NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
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SEP 24 1984

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SOURCE TYPE: Beta Gas Source

DESCRIPTION:

The New England Nuclear Model NER-588 is a krypton-85 source used in industrial beta gauging applications. The krypton gas is introduced into the capsule by way of a copper filled tube. This is crimped and soldered sealed. The capsule has dimensions of 3" X .75" width X 0.77" height and has a 2 mil titanium window. The capsule is then affixed to a back cover with two drive back screws. This forms the Model NER-588 source.

LABELING:

The source back plate is engraved with the isotope and activity. Space limitation prevents any further labeling. Each source is shipped with a data package which contains other pertinent information.

DIAGRAM:

See Attachment 1.

CONDITIONS OF NORMAL USE:

The NER-588 source is employed as a krypton-85 beta gauging source for use in gauging devices that measure the thickness of thin films of paper, plastic or metal.

PROTOTYPE TESTING:

The manufacturer reported that the source has been tested and achieved an ANSI N542 classification of 77C33322.

EXTERNAL RADIATION LEVELS:

The manufacturer reports the following dose rates at various positions and distances:

In Front of Source

5 cm	28050 mR/hr/mCi
30 cm	141 mR/hr/mCi
100 cm	70.125 mR/hr/mCi

In Back of Source

5 cm	.412 mR/hr/mCi
30 cm	.0114 mR/hr/mCi
100 cm	.00103 mR/hr/mCi

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO: NR-476-S-150-S

DATE: SEP 24 1984

PAGE 3 OF 4

SOURCE TYPE: Beta Gas Source

QUALITY ASSURANCE AND CONTROL:

The manufacturers quality assurance program provides package verification and test verification for the following critical tests:

- Content activity measurement by beta emission comparison to a reference source.
- Contamination/leakage testing.
- Physical dimensions as specified in the assembly.
- Visual defects resulting from damage to source capsule during assembly.

Quality assurance shall also provide final item acceptance of each NER-588 source and record deposition and acceptance logs, product data package and source certificate.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- The New England Nuclear Model NER-588 source shall be distributed only to persons specifically licensed by the NRC or an Agreement State.
- Handling, storage, use, transfer, and disposal: to be determined by the licensing authority.
- These sources shall not be subjected to environmental or other conditions of use which exceed ANSI N542 Classification 77C33322.
- This registration sheet and the information contained within the references shall not be changed or transferred without the written consent of the NRC.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO: NR-476-S-150-S

DATE:

SEP 24 1984

PAGE 4 OF 4

SOURCE TYPE: Beta Gas Source

SAFETY ANALYSIS SUMMARY:

Based on our review of the information and test data cited below, the claimed ANSI classification, we conclude that the Model NER-588 source design is acceptable for licensing purposes. Furthermore, we conclude that this source shall be expected to maintain its containment integrity for normal conditions of use and accidental conditions which might occur during uses specified in this certificate.

REFERENCES:

The following supporting documents for the New England Nuclear Source Model NER-588 is hereby incorporated by reference and is made a part of this registry document.

- New England Nuclear Letter of application dated June 12, 1984.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

DATE: _____

REVIEWER: _____

DATE: _____

CONCURRENCE: _____

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

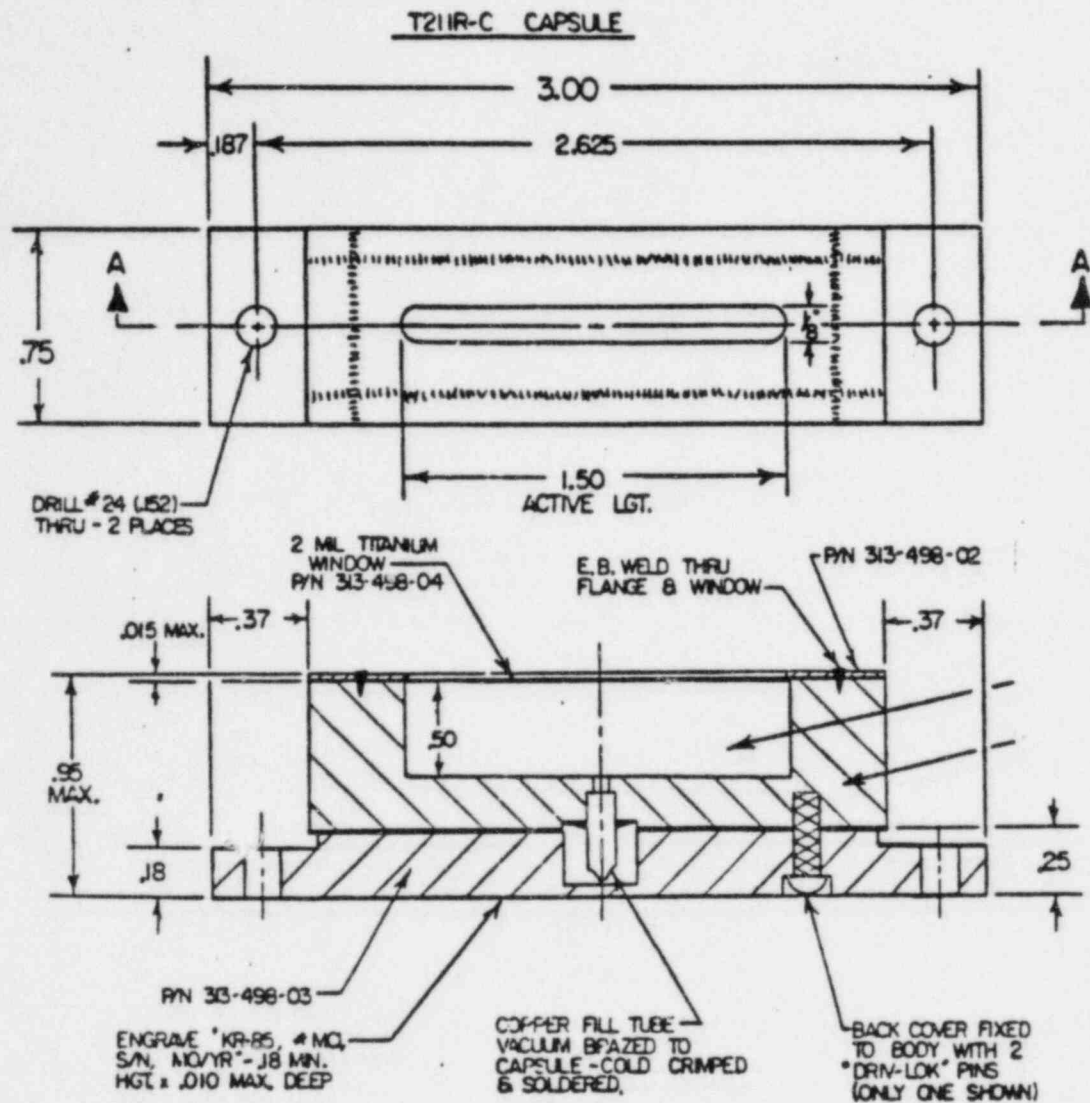
(ATTACHMENT 1)

NO:NR-476-S-150-S

DATE:

SEP 24 1984

PAGE OF



DIMINSIONS ARE IN INCHES

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO. NR-476-S-151-S

DATE: JAN 09 1985
....

PAGE 1 OF 5

SOURCE TYPE: Beta Ionization Ring Source

MODEL: NER-004R

MANUFACTURER/DISTRIBUTOR: NEN Products
331 Treble Cove Road
No. Billerica, MA 01862

ISOTOPE:

Nickel-63

MAXIMUM ACTIVITY:

15 millicuries

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: (N) Ionization Generators, Chromatography

CUSTOM SOURCE: _____ YES _____ ☒ NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO. NR-476-S-151-S

DATE:

July 1, 1964

PAGE 2 OF 5

SOURCE TYPE: Beta Ionization Ring Source

DESCRIPTION:

This source design is similar in methodology of construction to the Model NER-004. The only exception to this is that the NER-004R is electroplated on both the inner and external surface of the brass ring. That is to say the radioactive Nickel-63 is electroplated onto the entire surfaces of the brass cylindrical ring. The brass cylinder consists of 70% copper and 30% zinc. The cylinder has a length of 7.70 millimeters, a diameter of 7.0 millimeters, and a wall thickness of 0.15 millimeters. For more information on the Source Model NER-004 consult Registry Sheet NR-476-S-131-U.

LABELING:

The manufacturer reports that it is impractical to label the brass ring. Therefore, information as to the loading, the testing that was done on the source, and the handling procedures are provided as a separate attachment to the shipping papers.

DIAGRAM:

See Attachment 1.

CONDITIONS OF NORMAL USE:

The manufacturer reports that the ring source is intended for use in an air ionization source in a portable chemical agent monitor. The source is secured in the instrument probe assembly. The intended operational temperature range of the ring source is -55°C to 70°C. Also the source is to be used at ambient pressures and be exposed to air with varying degrees of humidity. Other applications of a research and development nature are acceptable provided the sources are not subjected to environmental conditions which exceed those listed in the following prototype testing section.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO. NR-476-S-151-S

DATE: JAN 22 1971

PAGE 3 OF 5

SOURCE TYPE: Beta Ionization Ring Source

PROTOTYPE TESTING:

The manufacturer reports that prototype ring sources were subjected to four environmental tests which meet or exceed the recommended operation and conditions of the source/instrument assembly.

- Methanol leech test--The source rings were individually placed in a 10 ml methanol solution for a period of 24 hours. The amounts of activity found in the solution by a liquid scintillation counting measurement were less than 5 microcuries.
- Water leech test--Source rings were then individually placed in a 10 ml water solution for a period of 24 hours. The amounts of activity found in the solutions by liquid scintillation counting measurements were less than 5 microcuries.
- Heat test--The source rings were placed in a Pyrex tube and heated to 250°C for 4 hours in air. The rings were removed from the oven and allowed to reach ambient temperature. The rings were viewed under 30X magnification and slight oxidization to the ring was observed. The smear test results of the rings each yielded less than 0.1 microcurie. Both pre and post heating conditions were tested.
- Cold test--The ring sources were individually placed in a dry ice bath for a period of 2 hours. The rings were removed from the bath and allowed to reach ambient temperature. The rings were viewed under 30X magnification and no damage to the rings was observed. The smear test results of the rings each yielded less than 0.5 microcurie after the test.

The above source testing criteria are very similar to the Model NER-004 which has been in use for several years with no reported problems.

EXTERNAL RADIATION LEVELS:

The following are measured dose rates submitted by the manufacturer for the ring source at various distances.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO. NR-476-S-151-S

DATE: JUN 03 1966

PAGE 4 OF 5

SOURCE TYPE: Beta Ionization Ring Source

On contact with the source surface--25 R/hr beta.

5 cm from source surface--10 R/hr beta.

30 cm from source surface--Background.

QUALITY ASSURANCE AND CONTROL:

The manufacturer has submitted an acceptable quality control program. This program consists of design controls, procurement controls, process quality controls, and final acceptance inspection and testing.

LIMITATIONS AND OTHER CONSIDERATIONS OF USE:

- The source shall be distributed only to persons specifically licensed by the NRC or an Agreement State.
- The source shall be leak tested at 6-month intervals using techniques capable of detecting 0.5 microcurie of removable contamination.
- Handling, storage, use, transfer and disposal: To be determined by the licensing authority.
- This registration sheet and the information contained within the references shall not be changed or transferred without the written consent of the NRC.
- Devices containing this source shall be properly evaluated by the NRC or an Agreement State prior to distribution in the commercial market.
- The source shall not be subjected to environmental or other conditions of use which exceed the prototype test criterion specified in this document.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO. NR-476-S-151-S

DATE: JAN 1985

PAGE 5 OF 5

SOURCE TYPE: Beta Ionization Ring Source

SAFETY ANALYSIS SUMMARY:

Based on our review of the information and test data cited below, that the testing done on this device is very similar to a previously deemed acceptable model, we can conclude that the Model NER-004R source design is acceptable for licensing purposes.

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

REFERENCES:

The following supporting documents for the Model NER-004R are hereby incorporated by reference and are made a part of this registry document.

- NEN Products letter dated October 1, 1984, with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: _____

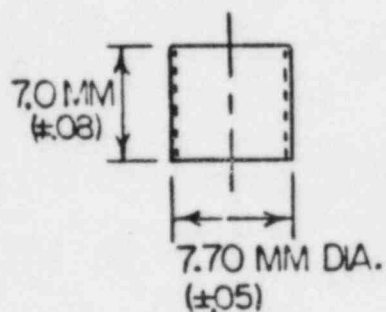
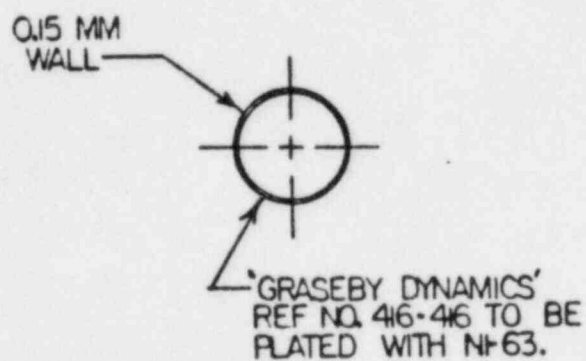
Date: JAN 1985

Reviewer: _____

Concurrence: Joseph M. Brown, Jr.

JAN 09 1984

ATTACHMENT 1



NER-004R NI-63 RING
SOURCE ASSEMBLY

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO. NR-476-S-152-S

DATE: JAN 11 1985

PAGE 1 OF 4

SOURCE TYPE: Photon Disc Source

MODEL: NER-474

MANUFACTURER/DISTRIBUTOR: NEN Products
331 Treble Cove Road
No. Billerica, MA 01862

ISOTOPE:

Barium-133

MAXIMUM ACTIVITY:

50 millicuries

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: (U) X-RAY FLUORESCENCE

CUSTOM SOURCE: _____ YES _____ X NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO. NR-476-S-152-S

DATE:

PAGE 2 OF 4

SOURCE TYPE: Photon Disc Source

JAN 11 1985

DESCRIPTION:

The source matrix consists of Barium-133 as a vitreous ceramic or as a barium chloride. The material is deposited in the recess of a 316 L stainless steel insert and fused to the insert to form a ceramic glaze. The barium chloride is uniformly deposited on glass fibers in the recess of the stainless steel insert and dried. The insert is placed inside the capsule, the cap is press fitted into the capsule and T.I.G welded to form the source. The source has a 7.9 mm diameter, a 5.1 mm length, and a window thickness of 0.25 mm.

LABELING:

The manufacturer reports the capsule is engraved with the following:

- Ba-133.
- S/N.
- The number of millicuries.
- The date, month/year.

DIAGRAM:

See Attachment 1.

CONDITIONS OF NORMAL USE:

According to the manufacturer, the NER-474 source capsule is designed for applications requiring the emission of gamma photons and X-rays. The sources are intended for use in such applications as fluorescence excitors in non-dispersive X-ray fluorescence analyzers of both the fixed station and portable types, gamma sources for thin section and low density thickness gauging systems and densitometers of transmission and backscatter type.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO. NR-476-S-152-S

DATE:

JAN 11 1985

PAGE 3 OF 4

SOURCE TYPE: Photon Disc Source

PROTOTYPE TESTING:

The manufacturer reports that the source uses the same capsule design as the previously approved Models NER-478C and NER-478H. Therefore, the manufacturer reports that the Model NER-474 source design would be expected to meet an ANSI N542-1977 performance classification of C64444.

Additionally, the manufacturer reports that the source was tested to the requirements of 10CFR71.77 and has achieved "Special Form" designation.

EXTERNAL RADIATION LEVELS:

See Attachment 2

QUALITY ASSURANCE AND CONTROL:

According to the manufacturer, capsule configuration control should be maintained by the product design section pursuant to the design control specifications. The design control section maintains control over procurement procedures, capsule component procedures, and incoming inspections on components. The product design section also provides final acceptance of each model source prior to distribution and documentation is sent with each sealed source certifying that it meets acceptable leak test criteria.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- The source shall be distributed only to persons specifically licensed by the NRC or an Agreement State.
- The source shall be leak tested at 6-month intervals using techniques capable of detecting 0.005 microcurie of removable contamination.
- Handling, storage, use, transfer, and disposal: To be determined by a licensing authority.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SOURCE

NO. NR-476-S-152-S

DATE:

~~300~~ 11 1985

PAGE 4 OF 4

SOURCE TYPE: Photon Disk Source

- The source shall not be subjected to environmental or other conditions of use which exceed ANSI classification of 77C64444.
- This registration sheet and the information contained within the references shall not be changed or transferred without the written consent of the NRC.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information and test data cited below, the claimed ANSI classification, we conclude that the Model NER-474 source design is acceptable for licensing purposes.

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

REFERENCES:

The following supporting documents for the Model NER-474 source design is hereby incorporated by reference and is made a part of this registration document.

- NEN products letter dated July 17, 1984, with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: _____

Date: _____

Reviewer: _____

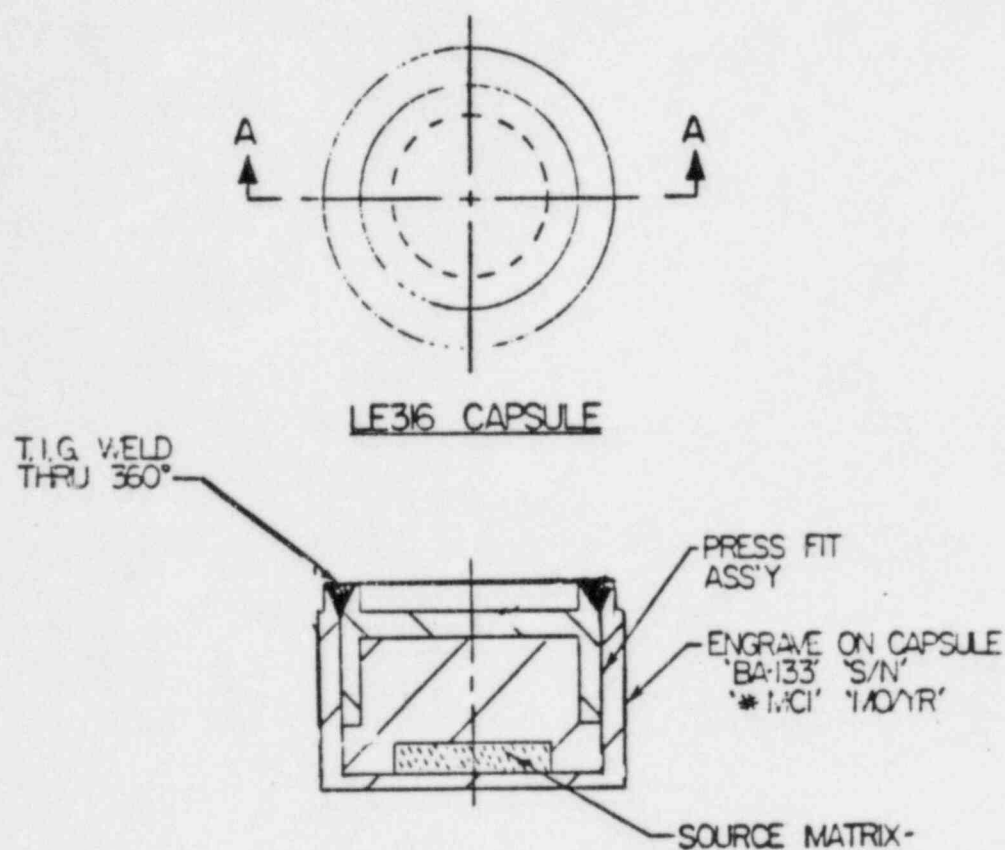
Concurrence: _____

Steven Bygget

Joseph M. Brown, Jr.

JAN 11 1985

ATTACHMENT 1



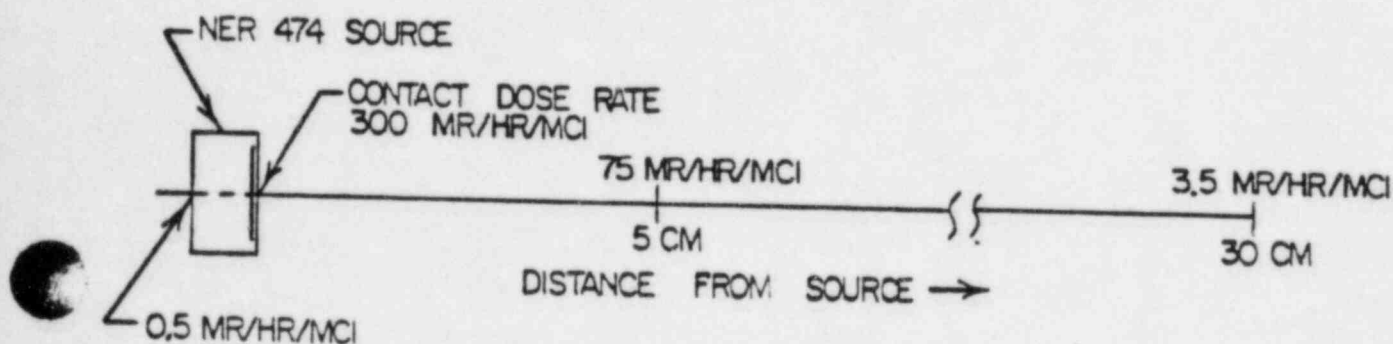
NER-474 BARIUM-133
SOURCE ASSEMBLY

JAN 11 1955

ATTACHMENT 2

The manufacturer reports the following dose rates:

Dose Rate Report



NOTES

1. The observed dose rates are measured with a survey meter thru an aluminized mylar window ($\sim 1 \text{ mg/cm}^2$ thick) and into a 6" long barrel. The meter is calibrated to $\pm 15\%$. The test source contains 4 mCi Ba-133.
2. The reported dose rates on contact, at 5 cm., and at 30 cm are calculated from the observed data correcting for distance and geometry of a planar source.
3. The reported dose rates are the maximum for the capsule design. Lower dose rates per millicurie are expected with higher loading due to self-absorption.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-525-D-101-S

DATE: APR 04 1985 PAGE 1 of 5

DEVICE TYPE: Bone Mineral Analyzer (Osteo-Analyzer)

MODEL: SPSHAXXX (XXX indicates the unit has been wired for 110 V AC or 220 V AC)

MANUFACTURER/DISTRIBUTOR: Osteon, Inc.
P.O. Box 430
649 California Avenue
Wahiawa, HI 96786

SEALED SOURCE MODEL DESIGNATION: AECL Source Model Number C-235, in a Model C-236 source holder

ISOTOPE:

Iodine-125

MAXIMUM ACTIVITY:

800 millicuries

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: (V) General Medical Use

CUSTOM DEVICE ☐ YES ☒ NO

#11

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-525-D-101-S

DATE: APR 04 1985 PAGE 2 of 5

DEVICE TYPE: Bone Mineral Analyzer (Osteo-Analyzer)

DESCRIPTION:

The Osteo-Analyzer is a three axis scanning bone densitometer, using an AECL Mo. C-235 I-125 source in a C-236 holder. The Osteo-Analyzer is fabricated entirely of machine aluminum and stainless steel, with ball bearings and stainless steel shafts used for major bearing surfaces.

The C-236 source holder is held in the lockable source compartment of the yolk, a welded aluminum piece that maintains proper orientation with the detector during all motion. The source is screwed to position in the source compartment, then locked in place with a locking cover to prevent loss or unauthorized removal of the source.

The shutter blocks the exit beam during all times that scanning is not being performed. The shutter is designed to close automatically upon loss of power to the scanner.

LABELING:

The C-236 source holder manufacturer by AECL is engraved with the manufacturer, isotope, source holder model, and source serial number.

The Osteo-Analyzer will have a warning label on the outside of the case. The source compartment will be marked with the standard warning symbol and the words "Caution-Radioactive Material." The beam direction will also be shown on the yolk. (See Attachment No. 1.)

DIAGRAM:

See attachments 2, 3, and 4.

CONDITIONS OF NORMAL USE:

The Osteo-Analyzer will be used by physicians or hospitals under a specific license issued by NRC or Agreement State for the device. The analyzer will be secured in the office or room used for the storage and use of the analyzer.

Under normal conditions, the user will not need to remove the cover to the analyzer, except to change sources. The sources are expected to last 60-90 days before replacement is necessary.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-525-D-101-S

DATE: APR 04 1985 PAGE 3 of 5

DEVICE TYPE: Bone Mineral Analyzer (Osteo-Analyzer)

PROTOTYPE TESTING:

The manufacturer did not test the device, rather, they relied on data submitted on each electronic part and its use to make a determination that the device would operate under the given conditions of use. Additionally, the sources were tested by the source manufacturer to the requirements of ANSI N542 and received the classification of 77C34334. The source holder is constructed of lead-lined stainless steel. This would further protect the source during normal and accidental conditions associated with the use of the device.

EXTERNAL RADIATION LEVELS:

The time period necessary for the patient to receive a dose of 10 mR is about 3 seconds at any one location, based on the calculated dose rate to the skin of 3.8 Rem/Sec. Since the beam is tightly collimated to 3 mm and is constantly moving, only a portion of the skin is exposed at any one time.

With the 800 mCi source, the scan speed is 4 mm/Sec, resulting in an exposure period to any portion of the skin of 0.75 Sec. Such an exposure period will result in an exposure to the skin of 2.85 mRem. Osteon reports that a dose rate of .001 mR/hr is obtained on any surface of the analyzer with the shutter closed, and reported 1 mR/hr at 3 cm from the device with the shutter open.

QUALITY ASSURANCE AND CONTROL:

The following items will be tested for proper operation on every unit:

- Operation of shutter mechanism, including fail-safe provision in case of power failure.
- Fit of source holder (C-236) to source compartment and fit of locking cover over source.
- Source-on indication or computer display when the source is actually on.

The checks shall be part of a final test/QC program developed for testing the Osteo-Analyzer results on the tests shall be documented for each unit.

Checks for removable contamination will be made on each unit before shipment to the user. The check will be capable of detecting 0.005 microcurie of removable contamination.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-525-D-101-S

DATE: APR 04 1985 PAGE 4 of 5

DEVICE TYPE: Bone Mineral Analyzer (Osteo-Analyzer)

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- The Osteo-Analyzer scanning bone densitometer shall be distributed only to persons specifically licensed by the NRC or an Agreement State.
- The device shall be leak tested at six (6) month intervals using techniques capable of detecting 0.005 microcurie of removable contamination.
- The device shall be installed and initially tested for proper operation of the source exposure mechanism, safety warning mechanism, safety warning components, labels, external radiation levels (source exposed, source shielded) and leak tested by Osteon, Inc., or other persons specifically licensed by the NRC or an Agreement State.
- Reviewer Note: Osteon recommends the user remove and install the source in the source holder only. However, the user may request authorization to install the source in the source holder.
- This registration sheet and the information contained within the references shall not be changed or transferred without the written consent of the NRC.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information and test data cited below, the device is equivalent to those previously deemed acceptable for licensing, we conclude that the Model SPSHAXXX Osteon bone mineral analyzer design is acceptable for licensing purposes.

Furthermore, we conclude that this device should be accepted to maintain its containment integrity for normal conditions of use and accidental conditions which might occur during uses specified in this certificate.

REFERENCES:

The following supporting documents for the bone mineral analyzer (Osteo-Analyzer) are hereby incorporated by reference and are made a part of this registry document:

- Osteon, Inc. letters dated on January 15, 1985, and February 20, 1985.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-525-D-101-S

DATE: APR 14 1985 PAGE 5 of 5

DEVICE TYPE: Bone Mineral Analyzer (Osteo-Analyzer)

ISSUING AGENCY:
U.S. Nuclear Regulatory Commission

DATE: APR 04 1985

REVIEWER: _____

DATE: APR 04 1985

CONCURRENCE: Joseph M. Brown, Jr.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICENO.: NR-525-D-101-SDATE: APR 04 1985CAUTION
RADIOACTIVE MATERIAL

This device may contain a maximum of 800 mCi of I-125. The maximum skin entrance dose rate in the primary beam path is less than 2.5 mR/second. THIS LABEL MUST NOT BE REMOVED.

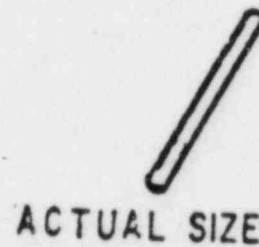
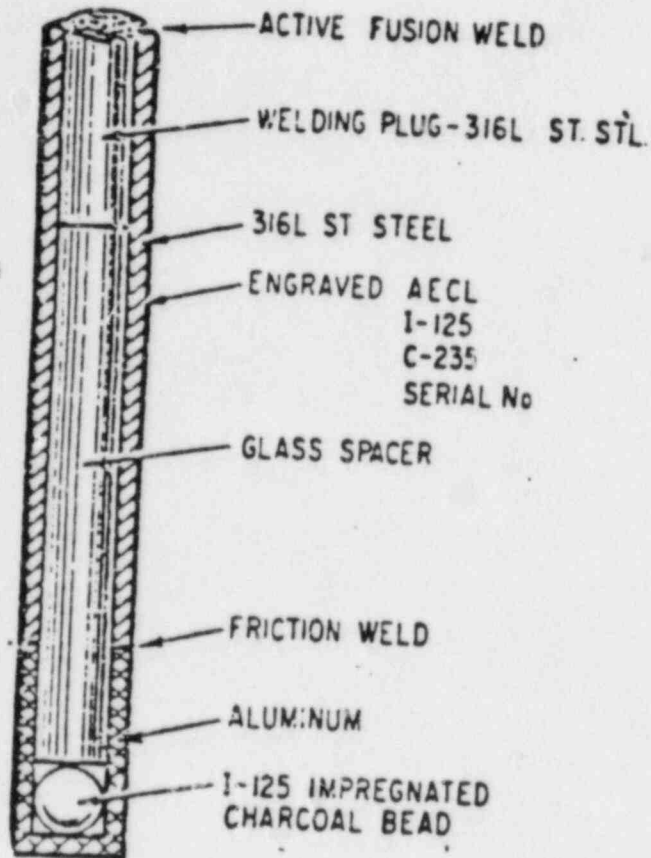
CAUTION: Federal law restricts this device for use by or on the order of a physician.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-525-D-101-S

DATE: APR 4 1985

ATTACHMENT #2



C-235

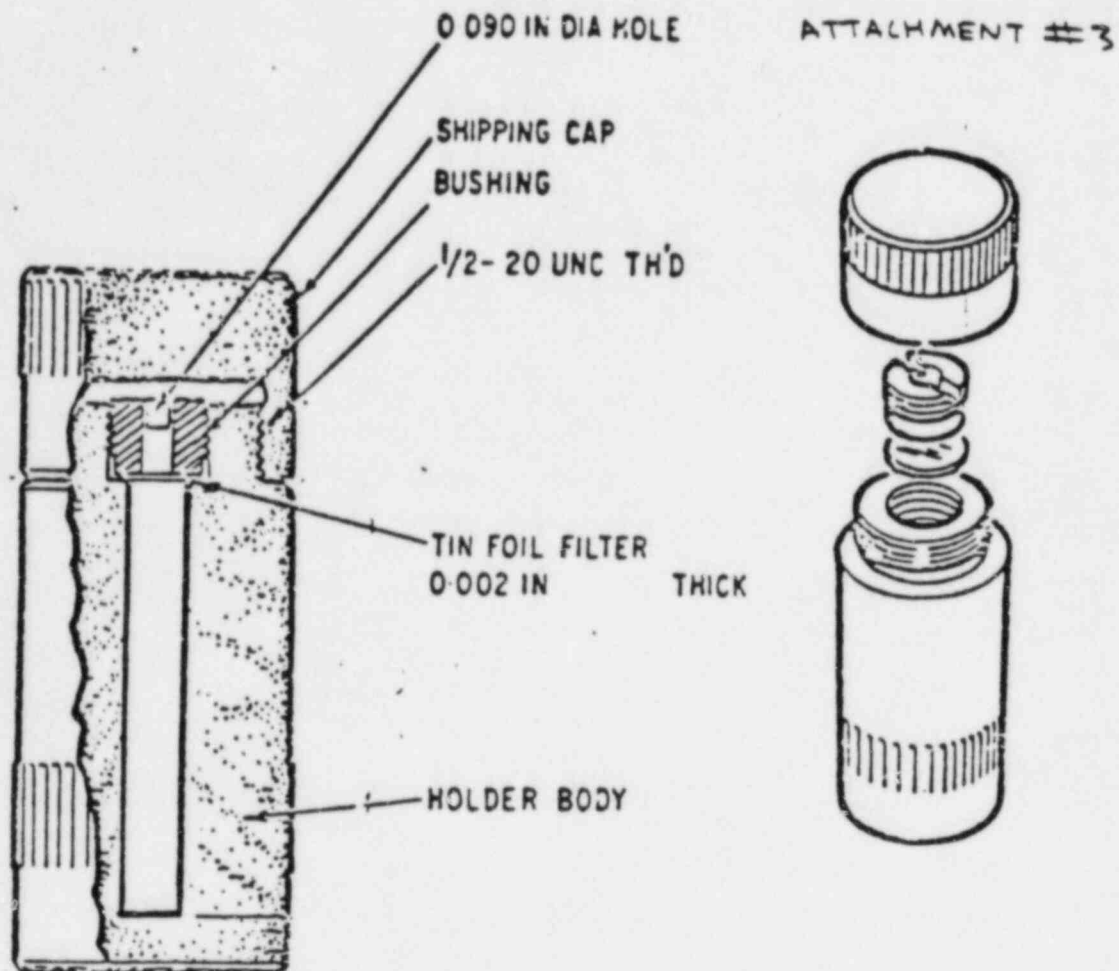
IODINE 125
CAPSULE ASSEMBLY

THIS ASSEMBLY CAN BE USED WITH CAPSULE HOLDER-C 236

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-525-D-101-S

DATE: APR 04 1985



SECTION SCALE 2:1

C-236

IODINE 125 CAPSULE HOLDER

THIS HOLDER WILL ACCOMMODATE CAPSULE ASSEMBLY-C235

4. ENGRAVED BOTTOM OF HOLDER - AECL

I-125

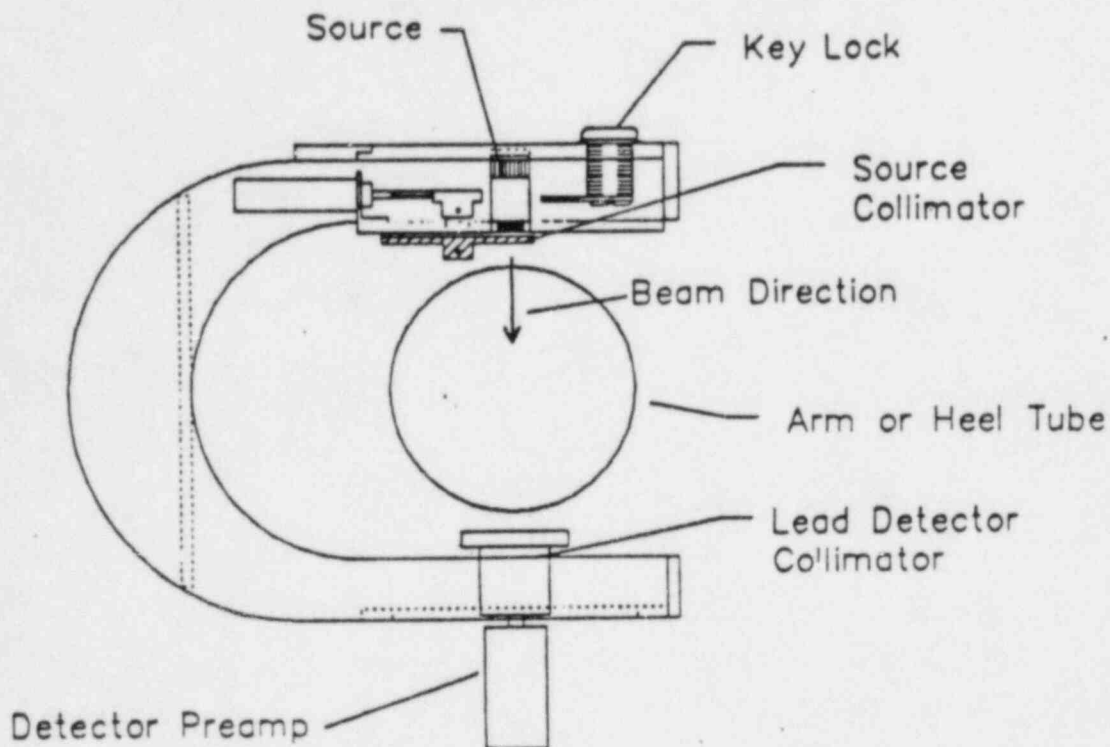
C-236

B SERIAL No

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-525-D-101-S

DATE: APR 04 1985

 **Osteon**
INCORPORATEDModel: SPSHAXXX

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(Amended in Entirety)

NO: NR-616-D-101-E

DATE:

JAN 23 1985 PAGE 1 OF 1

DEVICE TYPE: Ionization Smoke Detector

MODEL: EGD 4 and 5 Series

MANUFACTURER/DISTRIBUTOR:

Square D Company
Electrical Equipment
P.O Box 4000
Pinellas Park, FL 33565

MANUFACTURER/DISTRIBUTOR:

SEALED SOURCE MODEL DESIGNATION:

Foil sources, NRD Model A-001 or Amersham
Model AMM-1001H

ISOTOPE: Americium-241

MAXIMUM ACTIVITY: 1 microcurie

LEAK TEST FREQUENCY: Not required

PRINCIPAL USE: (P) Ion Generators, Smoke Detectors

CUSTOM DEVICE: ☐ YES ☒ NO

DEVICE TYPE: Ionization Smoke Detector

ISSUING AGENCY: U. S. Nuclear Regulatory Commission

Date:

1/23/85

Reviewer:

James W. Gattis

Date:

1/27/85

Concurrence:

[Signature]