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

NO: TX333S129S DATE: August 18, 1987 PAGE 1 OF 5

SEALED SOURCE TYPE: X-ray and gamma source

MODEL: GD-1X Series

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

ISOTOPE: Gadolinium-153 MAXIMUM ACTIVITY: 1.5 Curies

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: Other

CUSTOM SOURCE: _____ YES __x__ NO

CUSTOM USER:

A/15

SEALED SOURCE TYPE: X-ray and gamma source

DESCRIPTION:

The GD-1X Series contains the oxide of gadolinium-153 encapsulated in various metals. The "X" designator describes the metal encapsulation. The table below provides physical information on each type of source.

Designator	Encapsulation Material	Diameter (in.)	Length (in.)
T	titanium	0.225	0.885
	titanium	0.225	0.500
S	17-4PH stainless steel	0.185	0.310
S	17-4 stainless steel	0.225	0.885
A	T-2027-T4 aluminum	0.225	0.885
B	17-4 PH S.S. W/Be window	0.240	0.885

The gadolinium-153 oxide contains Eu-152 and Eu-154 as an impurity at 50-100 parts per million (0.5-1.0 mCi. Eu-152 and Eu-154/Ci. Gd-153).

LABELING: Each source is engraved with the model number, the isotope and the serial number.

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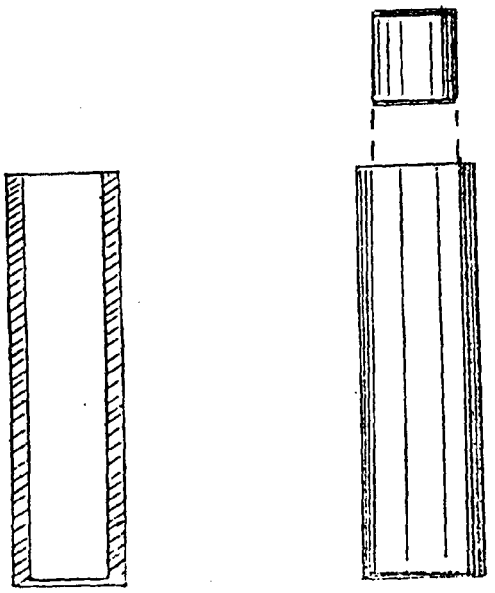
DIAGRAM:



The Model GD-1X Series

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CONDITIONS OF NORMAL USE:

This source is designed primarily for medical diagnostic research and medical diagnostic use, **but may also be used as an X-ray or gamma calibration source.** The source is installed into medical equipment to be used under laboratory conditions. Because the half life of Gd-153 is only about 240 days, the expected useful life of the source is 3 years.

PROTOTYPE TESTING:

This source was tested and found to meet *ANSI classification 77C32312* using all encapsulations.

EXTERNAL RADIATION LEVELS:

Exposure rates of 1 Ci of Gd-153 at a distance of 30 cm are 0.35 R/hr, for the pellet end and 0.30 R/hr for the weld end of an aluminum encapsulation. A stainless steel encapsulation will reduce exposure rates to 16 percent of these values.

QUALITY ASSURANCE AND CONTROL:

Each capsule is tested using the vacuum-ethylene glycol leak test method and is tested to meet prototype specifications.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

1. This sealed source shall be distributed to authorized users for the purpose of medical research and/or use. This includes Group VI licensees pursuant to 10CFR35. **This source may also be used as a calibration and check source for radiation detection instrument testing.**
2. This sealed source shall be leak tested at six month intervals.
3. Specifics of handling, storage, use, transfer and disposal should be determined by the licensing authority.

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SAFETY ANALYSIS SUMMARY:

Based upon the information submitted and the fact that this source will be used by persons trained in the medical professions, this sealed source can be used within acceptable limits.

REFERENCES:

This summary was prepared with the aid of Gulf Nuclear, Inc. letters dated April 5, 1979, March 25, 1980, April 23, 1980, July 25, 1983, October 15, 1985, November 14, 1985, and July 22, 1987 and all associated drawings, documents and procedures.

DATE: August 18, 1987 REVIEWED BY: Floyd K. Hamilton

DATE: August 18, 1987 REVIEWED BY: Joseph G. Klinger

ISSUING AGENCY: Texas Department of Health
Bureau of Radiation Control