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1. 1

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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 X 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 value. (c) Krypton-85 gas enrichment used and. (d) capsule internal specific pressure.



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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.



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<sup>2</sup> thick.
- 2. Gamma radiation dose rates are measured with a survey meter thru a plastic window which is 500 mg/cm<sup>2</sup> thick and filters all the beta radiation.
- 3. The survey meter is calibrated to + 15% and the test sources contain  $\sim$  5 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 quard 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

DCT 1 8 1982

Date: OCT 1 8 1982

Reviewer: Joseph M. Town p

Date: