## REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES SAFETY EVALUATION OF SEALED SOURCES (Corrected Copy)

140

PAGE 1 OF 4 NO: NR476S147S DATE: AUG 6 1992 DEVICE TYPE: NEN Americium-241 Low Energy Photon Disc Source

MODEL: NER-478H

12

MANUFACTURER/DISTRIBUTOR:

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

MANUFACTURER/DISTRIBUTOR:

ISOTOPE: Americium-241 MAXIMUM ACTIVITY: 10 millicuries

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: X-Ray Fluorescence

CUSTOM DEVICE:

YES X NO

8403020199 840209 PDR FOIA HAMMITT84-74 PDR

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

NO: NR47651475

## DATE: AUG 6 1982

PAGE 2 OF 4

DEVICE TYPE: NEN Americium-241 Low Energy Photon Disc Source

## DESCRIPTION:

The source matrix consists of Americium-241 as a vitreous ceramic containing up to 50 weight percent Americium-241. The ceramic is deposited in the recess of a stainless steel insert/shield and fused to the insert to form a ceramic glaze. The shield is placed inside the capsule, the cap is press-fitted into the capsule, and T.I.G. welded to form a sealed source. The ceramic matrix has a melting point of  $\sim$ 800°C and a typical H<sub>2</sub>O immersion leach rate of 2 x 10<sup>-3</sup>% per 24 hours. The source capsule configuration is as follows:

0	Assembled size	0.31 "diameter x 0.20" high				
		(7.9 mm x 5.1 mm)				
0	Weight	0.7 grams				
0	"Window" thickness	9-11 mils (0.25 mm)				
0	Construction material	CRES 3/6 L stainless steel				

#### LABELING:

The capsule is permanently engraved with the companies unique serial number, Am-241, activity, the month and year and the dimensions of the source.

#### DIAGRAM:

See enclosure.

#### CONDITIONS OF NORMAL USE:

The NER-478 source capsule is designed for applications requiring the emission of low energy (<200 keV) gamma photons and X-rays. These sources are intended for use in such applications as fluorescence exciters in non-dispersive X-ray fluorescence analyzers of both the fixed station and portable types, gamma sources for thin section/low density thickness gauging systems and densitometers of transmission and backscatter type. The source should not be subjected to environmental conditions which exceed its ANSI N542-1977 Performance Classification C64545 or "Special Form" requirements per 10 CFR Part 71.4.

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

# NO: NR476S147S DATE: AUG 0 1582 PAGE 3 OF 4

DEVICE TYPE: NEN Americium-241 Low Energy Photon Disc Source

#### PROTOTYPE TESTING:

The Environmental Testing Report of the NER-478H <sup>241</sup>Am disc source has indicated qualification of the capsule designs pursuant to ANSI N542-1977 requirements for Performance Classification C64545. Additionally, the "Special Form" testing report of the NER-478H <sup>241</sup>Am source has indicated qualification of the capsule design pursuant to ANSI N542-1977, Appendix E, satisfying the requirements for "Special Form" material per 10 CFR Part 71.4.

### EXTERNAL RADIATION LEVELS:

The unshielded radiation levels from the source as measured by New England Nuclear with a thin window (1 mg/cm<sup>2</sup> mylar) survey meter are reported as:

D	istance	Levels		
5	cm	35 mr/hr/mci		
30	cm	0.16 mr/hr/mci		

#### 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

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

10: 1.R47651475 DATE: AUG 6 1982 PAGE 4 OF 4

DEVICE TYPE: NEN Americium-241 Low Energy Photon Disc Source

#### LIMITATIONS AND/OR OTHER CONDITIONS OF USE:

- This source shall be distributed only to specific licensees of the NRC or Agreement States.
- Handling, Storage, Use, Transfer and Disposal: To be determined by the licensing authority.
- This source shall not be subjected to environmental or other conditions of use which exceed the American National Standards Institute (ANSI NR542-1977) Classification of 77C64545.
- This source shall be used and/or stored in devices and/or shields which are labeled in accordance with the requirements of \$20.203, 10 CFR 20 or equivalent Agreement State regulations.

## SAFETY SUMMARY EVALUATION:

Based on the prototype tests, the claimed ANSI source classification and the stated quality assurance and control program to a carried out by the manufacturer, it is our conclusion that the Model NER-478H source is acceptable for licensing purposes. Furthermore, when used in properly designed holders by specific licensees who are required to train and equip their personnel to safety handle and mount the sources and guard against radiation exposure, it appears unlikely that persons would be exposed to radiation limits in excess of those specified in 10 CFR 20.

#### **REFERENCES:**

The following supporting documents for the Model NER-478H are hereby incorporated by reference and are made part of this registry document:

- New England Nuclear Corporation letter with attachments dated April 20, 1982.
- New England Nuclear Corporation Telegram dated May 13, 1982.

ISSUING	AGENCY: U.S.	Nuclear	Regulatory	Commission	^		
Date:	AUG	1305		Reviewer:	Joseph	1 Mi Lorown	p.
Date:	AUG	6 1982		Concurrence:	12 Sand	fing-	0
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#### NO: NR476S147S

DATE: May 20, 1982

PAGE: 2 OF:

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**DIAGRAM:** 

