

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES  
SAFETY EVALUATION OF DEVICE

NO.: NR452D101S

DATE: September 03, 1980

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DEVICE TYPE: Pipe Monitor

MODEL: Merrick Scale NCPM

MANUFACTURER/DISTRIBUTOR: Merrick-Scale Manufacturing - Dist.  
180-190 Autumn Street  
Passaic, NJ 07055

MANUFACTURER/DISTRIBUTOR: New England Nuclear Corp. - Mfr.  
601 Treble Cove Road  
North Billerica, MA 01862

SEALED SOURCE MODEL DESIGNATION: New England Nuclear  
NER-570 (ANSI C54434)

ISOTOPE: Cesium-137

MAXIMUM ACTIVITY: 200 millicuries

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: Beta Gauges

CUSTOM DEVICE: ☐ YES ☒ NO

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DESCRIPTION:

The source housing (Model NCPM) consists of a stainless steel tube (source holder), 1.9 inches minimum of lead shielding, and a 1/16 inch thick steel casing. The casing is welded to a 1/4 inch steel plate. The source holder locates the source in the center of the shield and a 0.16 inch diameter collimator allows the emission of the useful beam. The shutter has four positions, "off", "on", and two calibrate positions. The source housing is designed to use a 200 mCi Cs-137 source manufactured by New England Nuclear Corporation.

CONDITIONS OF NORMAL USE:

The Model NCPM is designed for use as a nuclear coal pipe monitor to determine the amount of coal present inside a feed pipe. The source housing should not be subjected to environmental conditions which exceed its ANSI N538-1978 performance classification (see NBS Handbook No. 129).

PROTOTYPE TESTING:

A single prototype of the Model NCPM was tested by New England Nuclear Corp. The test data shows that the source housing qualifies for an ANSI N538-1978 performance classification:

1. ANSI-64-545-564-R2 with 50 mCi
2. ANSI-64-435-454-R2 with 200 mCi

The prototype source housing was subjected to a high temperature test and drop test to simulate a fire and a subsequent detachment of the source housing from its frame support. The outer container was damaged by the test, however, the source containment remained intact.

EXTERNAL RADIATION LEVELS:

Radiation measurements of the source housing when loaded with 200 mCi of Cs-137 are as follows:

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EXTERNAL RADIATION LEVELS (CONT'D):

SOURCE HOUSING #2 w/200 mCi Cs-137 SOURCE			
Shutter Position	Isodistance Contour	Dose Rate (7 mg/cm <sup>2</sup> )	Dose Rate (300 mg/cm <sup>2</sup> )
ON	5 cm	45 mr/hr	45 mr/hr
	30 cm	30 mr/hr	30 mr/hr
	100 cm	less than 0.2 mr/hr	less than 0.2 mr/hr
OFF	5 cm	45 mr/hr	45 mr/hr
	30 cm	4.3 mr/hr	4.3 mr/hr
	100 cm	0.61 mr/hr	0.61 mr/hr

QUALITY ASSURANCE AND CONTROL:

Prior to shipment each unit is subjected to and passes an acceptable series of tests and inspections conducted by NEN. (Merrick-Scale Manufacturing Co. letter dated November 1, 1979 and New England Nuclear Corp., letter dated October 25, 1979 and NEN dwg. 313-316, Rev. D.).

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- A. Model NCPM source holder may be distributed only to specifically licensed individuals.
- B. Installation, relocation, repair, testing and servicing involving the radioactive material, its containment and shielding shall be performed by John Potter Associates or other persons specifically licensed by NRC or an Agreement State.

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LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE (CONT'D):

- C. The device shall be tested for radioactive leakage at installation, at source replacement and at intervals not to exceed six (6) months by John Potter Associates or by persons specifically licensed by the NRC or an Agreement State or according to procedures authorized by the NRC or an Agreement State.
- D. The Model NCPM source holder shall be removed from service only by John Potter Associates or other persons specifically licensed by NRC or Agreement States and shall be transferred only to persons specifically licensed to receive it.

REFERENCES:

This Certificate of Registration of the NCPM source holder is based on information submitted by Merrick-Scale Manufacturing Co., in their letters dated May 16, 1979, August 16, 1979, September 4, 1979, November 1, 1979, November 16, 1979 and enclosures thereto, and information submitted by New England Nuclear Corporation in their letters dated September 28, 1979 and October 25, 1979 and enclosures thereto and telephone call to NEN on October 17, 1979. (See also License #29-14814-01 issued to John Potter Associates.)

DATES AND SIGNATURES:

Date September 3, 1980

Reviewed By \_\_\_\_\_

Date September 3, 1980

Concurrence \_\_\_\_\_

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission