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Ser OEM/ 000860
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From: Commanding Officer, Navy Environmental Health Center

Subj: NAVAL RADIOACTIVE MATERIALS PERMIT (NRMP) INFORMATION NOTICE
2006-02: PROCEDURE FOR USE OF RADIATION SOURCE KIT FOR AN/PDQ-1
RADIAC

Ref: (a) NAVENVIRHLTHCEN ltr 6470 Ser OEM/12091 of 28 Jun 01 (NRMP Information
Notice 2001-03)
(b) NAVENVIRHLTHCEN ltr 6470 Ser OEM/000318 of 19 Mar 03 (NRSC Bulletin
2003-01)

Encl: (1) User's Guide: Radiation Source Kit, Multifunction

1. Prior to October 2002, Title 10, Code of Federal Regulations, Part 35.51 (10 CFR 35.51) required medical use licensees to check each radiation survey instrument for proper operation with a dedicated check source each day of use by comparison to the apparent exposure rate determined at the time of calibration. To avoid having to ship a radioactive check source with each AN/PDQ-1 RADIAC survey instrument to the calibration facility, reference (a) provided NRMP permittees with procedures to determine the apparent exposure rate from a dedicated check source maintained at the permittee's facility, and attach the result to the AN/PDQ-1. In October 2002, the regulations in Part 35.51 were relocated to Part 35.61, and the specific requirement for the daily use of a check source was dropped; however, the Naval Radiation Safety Committee (OPNAV-N455) in reference (b) required that the procedures be continued by all NRMP permittees.

2. Within the past few months, the Space and Naval Warfare Systems Center (SPAWARSYSCEN) Charleston distributed to NRMP permittees, the new Radiation Source Kit, Multifunction Models MX-12132/S, MX-12133/S, MX-12134/S and MX-12135/S, each containing different combinations of sealed check sources. The Radiation Source Kit, Multifunction is designed to response check the IM-265/PDQ and IM-266/PDQ RADIAC meters, the DT-680/PDQ gamma/beta probe, and depending on the kit model, the DT-304/PDR beta probe and/or the DT-681/PDQ alpha probe. As a side note, for proper operation of the DT-304/PDR beta probe, the probe must first be connected with the DT-685/PDQ beta probe interface, which is then connected to the RADIAC meter. When the beta probe interface is properly connected to a RADIAC meter, the beta data automatically turns on, and data from the detector probe displays automatically.

3. In addition to complying with the User's Guide in enclosure (1) or following the alternate procedures as described in reference (a), NRMP permittees shall comply with the following additional procedures:

a. Upon return of each AN/PDQ-1 from the calibration facility, the apparent exposure rate using the Radiation Source Kit, Multifunction or a dedicated check source shall be determined. The

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apparent exposure rate, date determined, and the initials of the person who made the measurement shall be conspicuously posted on the instrument and/or detector probe(s) as applicable.

b. The procedure described above shall be used to check the instrument for proper operation each day of use as required by reference (b) by comparing the current apparent exposure rate to the apparent exposure rate recorded on the instrument. The source and detectors shall be placed at the same location used to determine the initial reading to limit any changes due to distance and backscatter. The difference between the daily reading and the initial reading shall not exceed twenty (20) percent. No records of the daily check are required to be maintained.

c. To ensure that there was no damage to the instrument during shipment from the calibration facility, the difference between the average of the last ten (10) apparent exposure rate determinations just prior to calibration and the rate determined upon return from calibration shall not exceed twenty (20) percent. If the difference exceeds twenty (20) percent, the instrument shall be returned to the calibration facility for recalibration.

4. Use of the Radiation Source Kit, Multifunction for conducting daily instrument response checks is authorized as an alternate to using a dedicated check source as described in reference (a). The daily check shall be conducted in accordance with the procedures described above. Incorporate enclosure (1) and the additional procedures in paragraph 3 above into your Standard Operating Procedures manual and ensure that appropriate personnel are trained on the procedure.

5. For additional information, please contact LCDR B. D. Pomije, MSC, USN, Radiation Health Team Leader, at DSN 377-0766 or (757) 953-0766, Fax (757) 953-0685, or e-mail at pomijeb@nehc.med.navy.mil.



B. D. POMIJE
By direction

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USER'S GUIDE

**RADIATION SOURCE KIT,
MULTIFUNCTION**

**Models: MX-12132/S
MX-12133/S
MX-12134/S
MX-12135/S**

SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures. These are precautions that personnel must understand and apply during operation.

WARNING

Under no circumstances should any person remove any source plate, except when approved in writing by NAVSEA 04LR. No service, maintenance or troubleshooting is authorized.

WARNING

Use caution when opening and closing aluminum covers over the electroplated sources. Do not touch surface of the electroplated sources with instruments or foreign objects.

GENERAL INFORMATION

1.0. INTRODUCTION. The information in this guideline is applicable to all Radiation Source Kit, Multifunction Models MX-12132/S, MX-12133/S, MX-12134/S and MX-12135/S. Failure to follow the methodology outlined herein may result in unsatisfactory source response check of the equipment.

1.1. PURPOSE. The Radiation Source Kit, Multifunction is designed to response check the IM-265/PDQ, IM-266/PDQ, DT-680/PDQ, and depending on the kit model, the DT-304/PDR beta probe and/or the DT-681/PDQ alpha probe. The Radiation Source Kit, Multifunction may also be used as a response check for the IM-231()/PD and other RADIAC instruments, if desired.

1.2. DESCRIPTION. The Radiation Source Kit, Multifunction is a hinged aluminum case containing up to three radioactive sources, depending on the model. The hinge is designed to allow the case to lay flat when opened. The radioactive sources are housed on aluminum plates. Depending on the model, kits will contain one or two source housing plates.

1.3. APPLICATION. The Radiation Source Kit, Multifunction as described in this guideline is intended for Radiological Affairs Support Program (RASP) end users only.

WARNING

Under no circumstances should any person remove any source plate, except those approved in writing by NAVSEA 04LR. No service, maintenance or troubleshooting is authorized.

The Cesium-137 radioactive source is housed in the bottom half of the kit in a tungsten alloy lined well. The source is sealed within the well. Embossed areas for the IM-265/PDQ, IM-266/PDQ and DT-680/PDQ are milled into the surface of the source housing plate to aid in facilitating proper alignment.

The Technicium-99 and/or the Thorium-230 radioactive sources (depending on model) are housed in the top half of the kit. These sources are individually covered with hinged aluminum covers. These covers are held closed by a magnetic strip mounted in the surface of the source housing plate. Embossed areas for the DT-681/PDQ alpha probe and the DT-304/PDR beta probe are milled into the surface of the source housing plate.

WARNING

Use caution when opening and closing aluminum covers over the electroplated sources. Do not touch surface of the electroplated sources with instruments or foreign objects.

1.4. KIT SPECIFICATIONS.

Physical Dimension: 12" x 5¼" x 10"
 Weight: MX-12132/S - 9 lbs 5 oz.
 MX-12133/S - 9 lbs 8 oz
 MX-12134/S - 8 lbs 12 oz
 MX-12135/S - 9 lbs 5 oz

The Radiation Source Kit, Multifunction Models MX-12132/S, MX-12133/S, MX-12134/S and MX-12135/S contain the following radioactive sources and approximate quantities:

MX-12132/S 300 kBq (8 uCi) Cesium-137 GAMMA source
 15 Bq (0.0004 uCi) Technicium-99 BETA source

MX-12133/S 300 kBq (8 uCi) Cesium-137 GAMMA source
 15 Bq (0.0004 uCi) Technicium-99 BETA source
 700 Bq (0.02 uCi) Thorium-230 ALPHA source

MX-12134/S 300 kBq (8 uCi) Cesium-137 GAMMA source

MX-12135/S 300 kBq (8 uCi) Cesium-137 GAMMA source
 700 Bq (0.02 uCi) Thorium-230 ALPHA source

Note: The Thorium-230 radioactive source in the MX-12133/S and MX-12135/S source kits is listed on and regulated by the Naval Radioactive Materials Permit No. 08-00024-T1NP. These source kits are required to be physically inventoried on an annual basis and the results reported to SPAWARSYSCEN Charleston by January 31 of each year in accordance with RADIAC Policies and Procedures Manual SE700-AA-MAN-100/RADIAC.

The table below contains details for the radioactive sources:

Isotope	Type	Quantity	Form	Backing	Half-Life
Cesium-137	Gamma emitter	~ 8 uCi	Sealed source	Tungsten Alloy	30.0 Years
Technicium-99	Beta emitter	~ 0.0004 uCi	Electroplated	Aluminum	2.11 x 10 ⁵ Years
Thorium-230	Alpha emitter	~ 0.02uCi	Electroplated	Aluminum	7.54 x 10 ⁴ Years

1.5. SECURITY. The kits are kept closed with two locking latches. Two keys are provided for each kit. Additionally, the kits contain two studs, one each on the top and bottom halves of the kit. These studs are designed to allow a cable or other locking mechanism to be attached and locked, if desired.

1.6 LABELS. The following labels are affixed to the source kit:

Aluminum plate with three bladed radiation symbol and labeled
"RADIOACTIVE", see Figure 1

Nomenclature, see Figure 1

"Caution Radioactive Material", see Figure 2

Kit Serial Number and Isotope Information, see Figure 2



Figure 1. Labels attached to the outside of the kit.

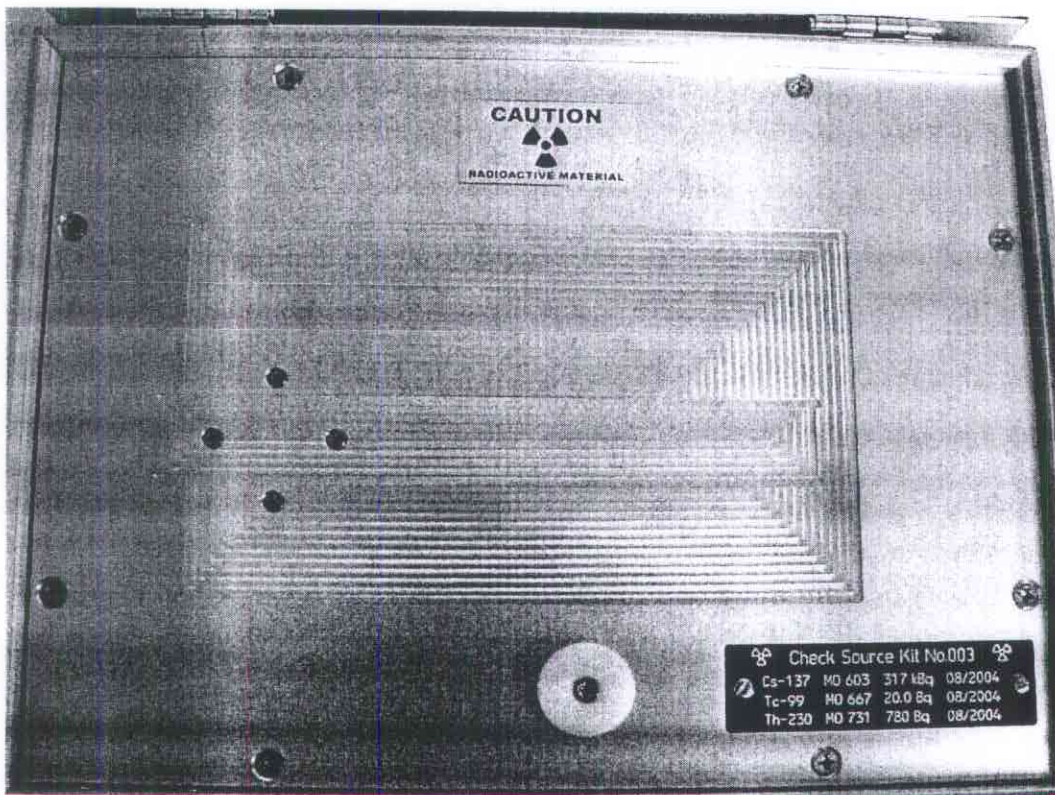


Figure 2. Labels attached to the inside of the kit.

OPERATION

2.0. SOURCE RESPONSE CHECK FOR IM-265/PDQ, IM-266/PDQ or DT-680/PDQ. Unlock and open the kit on a level surface in an area with low background radiation. If checking the IM-265/PDQ or IM-266/PDQ, place the instrument on the embossed area of the source housing plate with the detector centered over the source well (see Figure 3). If checking the DT-680/PDQ it should be oriented with the detector end over the source well (see Figure 4).

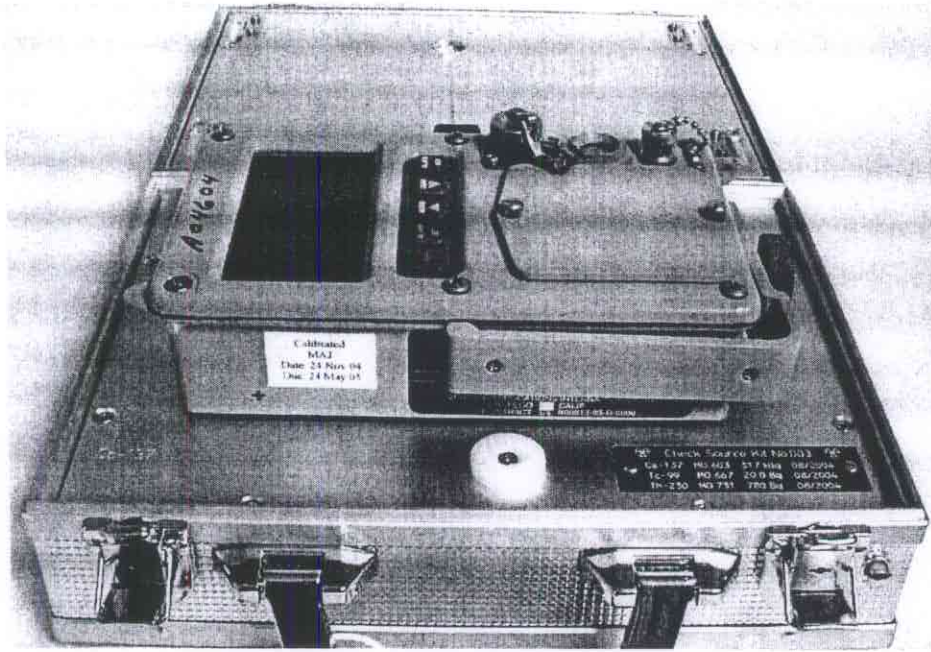


Figure 3. Configuration of IM-265/PDQ or IM-266/PDQ during source check.

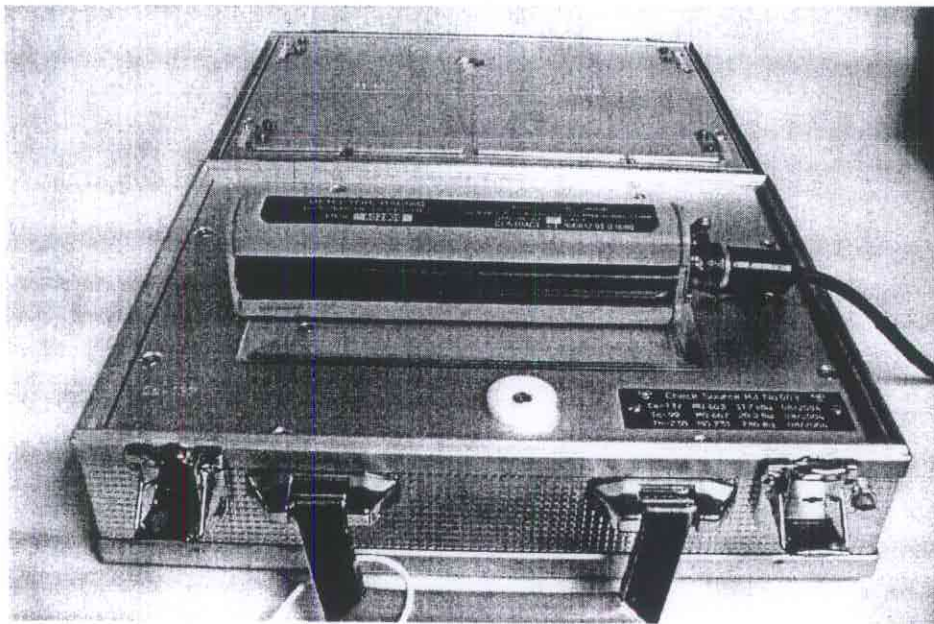


Figure 4. Configuration of DT-680/PDQ during source check.

2.1. SOURCE RESPONSE CHECK FOR DT-681/PDQ. Unlock and open the kit on a level surface in an area with low background radiation. Open the aluminum cover over the Thorium-230 radioactive source. Place the DT-681/PDQ alpha probe in the embossed area over the source (see Figure 5).

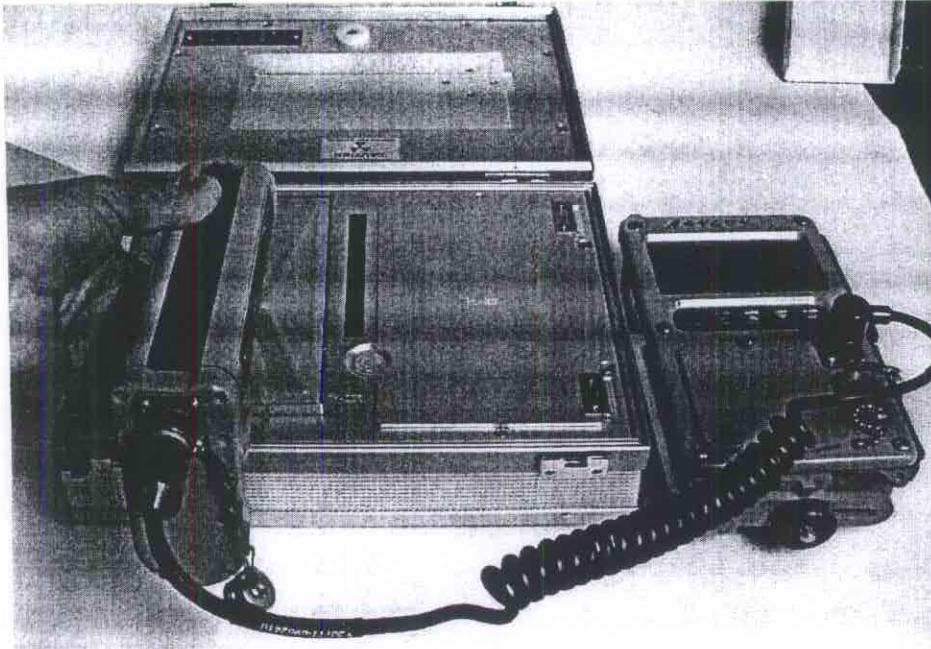


Figure 5. Configuration of DT-681/PDQ during source check.

2.2. SOURCE RESPONSE CHECK FOR DT-304/PDR. Unlock and open the kit on a level surface in an area with low background radiation. Open the aluminum cover over the Technetium-99 radioactive source. Place the DT-304/PDR beta probe in the embossed area over the source (see Figure 6).

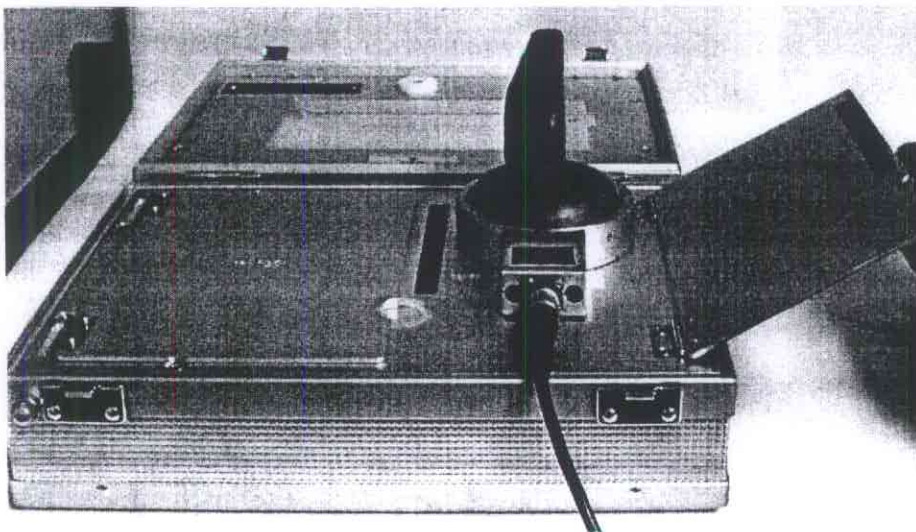


Figure 6. Configuration of DT-304/PD during source check.

2.3. SOURCE RESPONSE CHECK FOR IM-231()/PD. Unlock and open the kit on a level surface in an area with low background radiation. There is no embossed area on the source housing plate for the IM-231()/PD. The intersection of the cross hairs on the instrument indicates the location of the center of the detector tube. Using the cross hairs as a guide place the IM-231()/PD over the Cs-137 radioactive source as shown (see Figure 7).

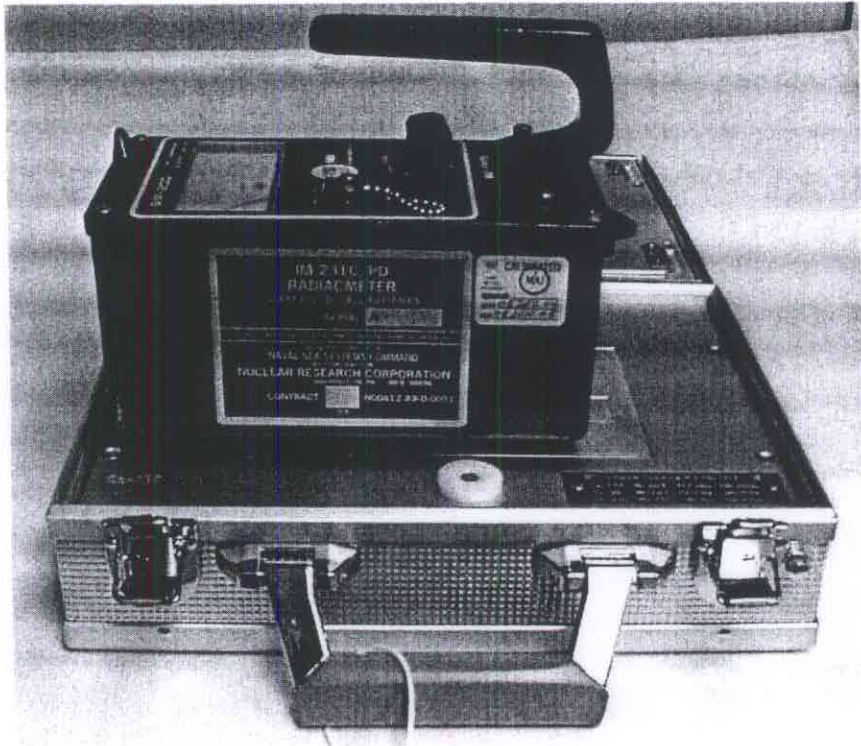


Figure 7. Configuration of IM-231()/PD during source check.