

<b>Environmental Health &amp; Safety Policy Manual</b>		
Issue Date: 08/29/2009		Policy # EHS-100.02
<b>Radiation Survey Meter Policy and Operation Procedure</b>		

**1.0 PURPOSE:**

Radiation survey meters are used at LSUHSC to indicate any contamination of radioactive particles subsequent to radiation work. This policy identifies the different types of meters used for the appropriate nuclide and basic operating procedures for these meters.

**2.0 SCOPE:**

Radiation survey meters shall be used in every LSUHSC radiation-labeled laboratory to detect the presence of one or more of the following isotopes:

- Cr 51
- I 125
- P 32
- S 35

These meters are used to perform surveys of experiments in areas of possible radioactive contamination by trained lab employees and by the Radiation Safety Officer when receiving isotope shipments and while performing quarterly lab inspections.

**3.0 RESPONSIBILITIES:**

**3.1 Environmental Health and Safety Department Radiation Safety Officer shall:**

- Perform annual meter calibrations.
- Retain all survey meter inventories for a minimum of three years.
- Provide training on survey meter use during the initial Radiation Safety course.

**3.2 Principal Investigators (PI) shall:**

- Purchase appropriate survey meters for every lab that has the potential to use one of the radioactive isotopes listed in Section 2.0 above. Notify Radiation Safety for choice selection assistance.
- Inform the Radiation Safety Officer of any purchase or disposal of survey meters to ensure inventory control.
- Ensure only properly trained lab employees use survey machines.



**3.3 Lab Employees shall:**

- Notify the Radiation Safety Officer or PI if survey meter is not up to date with current calibration.
- Perform battery check on all survey meters before use.

**4.0 IMPLEMENTATION REQUIREMENTS:**

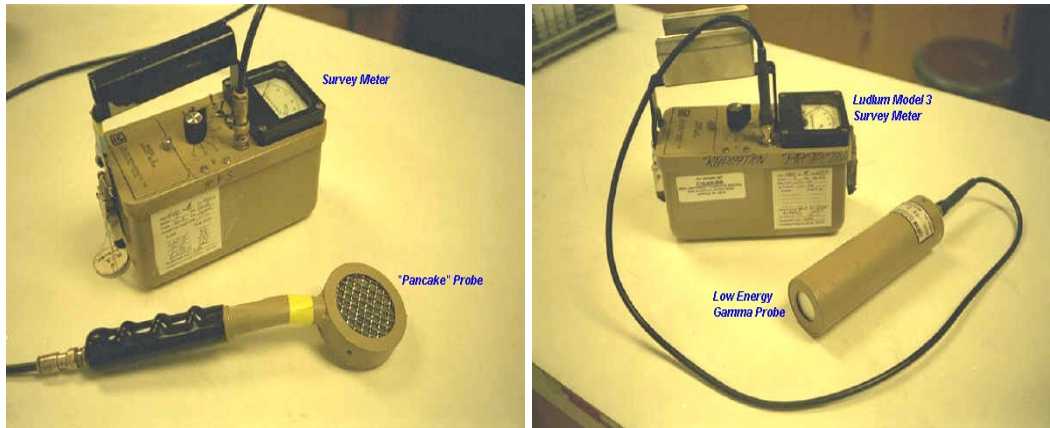
**4.1 Instrumentation**

Two sensor probes are to be used to detect different isotopes as shown in the table below:

<p style="text-align: center;"><b>Geiger Mueller (GM)</b></p> 	<p style="text-align: center;"><b>Scintillating (NaI)</b></p> 
<p>a) Generally used for detecting Beta Emitters.</p> <p>b) This model is also known as “Pancake” probe.</p> <p>c) Detects radiation via the ionization of a gas contained inside the probe.</p> <p>d) Capable of detecting alpha and gamma radiation but with very low efficiencies.</p> <p><b>Commonly used to detect:</b></p> <ul style="list-style-type: none"> <li>- C 14</li> <li>- P 32</li> <li>- S 35</li> </ul>	<p>a) Generally used for detecting Gamma Emitters.</p> <p>b) Detects radiation via the interaction of ionizing radiation with a scintillating crystal containing Sodium Iodine (NaI).</p> <p>c) Obtain a NaI probe when working with I-125.</p> <p><b>Commonly used to detect:</b></p> <ul style="list-style-type: none"> <li>- I 125</li> <li>- Cr 51</li> </ul>

## 4.2 Operation

Both Geiger Mueller (GM) and Scintillating (NaI) type probes can be used with the same meter. See images below.



### Steps:

- 1) Make sure meter calibration sticker is up to date. If not, notify the Radiation Safety Officer.
- 2) Ensure that the probe you are using is capable of detecting the radioisotope you are utilizing. If unsure, contact the Radiation Safety Officer.
- 3) Turn on meter and perform a battery check to make sure batteries are good (replace if necessary).
- 4) Make sure the sound switch is on.
- 5) Select the lowest scale available. Example scales on meters are generally (.1x) (1x) (10x) and (100x).
- 6) If a F/S (Fast/Slow) switch is available, move to Fast Mode. The Slow Mode is used for calibration purposes only.
- 7) Go into a contamination-free room or hall and measure the normal background counts per minutes (CPM) or millirem per hour (mR/hr) and record as background standard information.
- 8) Go to the desired area of concern and slowly take appropriate probe and scan the area about 1/2" from surface area and visually/audibly notice the response for any indications of contamination. Record this information.

- 9) Generally if the counts per minutes (CPM) are over three times background, the area should be cleaned of contamination and the survey should be performed again until the readings are below this standard. See helpful reading chart below.

**Survey Meter Readings**

0-150 cpm  
150-450 cpm  
  
>450 cpm

**Assessment of Measurements**

General background readings  
Suspect contamination  
(Generally 3x background)  
Contamination

- 10) Remember to turn off the survey meter once the work is completed.  
11) Contact the Radiation Safety Officer for further assistance.

**5.0 EMPLOYEE TRAINING AND EDUCATION:**

**5.1 Initial Training**

Survey meter operation is taught during initial Radiation Safety Course Training. Includes meter differences, operation and different scale readings.

**5.2 Training Elements**

See specific vendor survey meter operating manual.

**6.0 RECORDKEEPING:**

The Radiation Safety Officer shall keep all calibration, inspection and inventory records. Records shall be maintained for a minimum of three years.

**7.0. INSPECTIONS AND PROGRAM REVIEW:**

The Radiation Safety Officer shall inspect radiation survey meters during routine quarterly lab inspections to ensure proper functionality.