THE UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

UT Health Science Center: RSP09-Portable Radiation Survey Instrument Calibration and Use	
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PURPOSE

This procedure provides basic criteria concerning the recordkeeping and calibration of instruments used for radiation detection, measurements, and surveys.

PROCEDURE

All instruments used for measuring exposure rates or contamination are to be calibrated **at least once per year** unless the meter has been tagged as "Removed from Active Service." Calibrations are to be performed by individuals who meet the specified qualifications and using sources and procedures that assure compliance with federal and state regulations and license conditions.

- Rules concerning Meter use and calibration:
  - Meters are required to be available for use whenever any of the isotopes listed in Table 1 are present and/or in use in a lab and require their use.
  - Meter calibrated records shall be transferred to or maintained with the radiation safety officer.
  - The Instrument should have a calibration sticker, containing the calibration date and when the next calibration is due, affixed to the meter.
  - If a meter is not required to be calibrated, due to a lack of radioactive material, the meter may be tagged as "Removed from Active Service", this tag includes the RSO phone number, to allow the owner to request calibration.
  - Table 1 has been included on the next page of this sheet. Most common isotopes are included on the table to allow the user to determine if a meter is required and which probe is preferable or if there is a better option for detecting radiation in a spill or similar situation.

❖ If there are any questions regarding the use of Portable Radiation Survey Instruments on the UTHSC campus, please contact the RSO at 901-448-6114.

Table 1. Typical Instrument Response

Nuclide, E (Average), Abundance	Appropriate Survey Instrument	Response to Calibration Source	
		Efficiency	cpm/nCi
Very low-energy electron/beta emitters			
H-3, 6 keV, 100%	Portable instruments are not applicable; use liquid scintillation		
Fe-55, 6 keV, 60%			
Ni-63, 17 keV, 100%			
Low-energy beta emitters			
C-14, 50 keV, 100%	Can use a Thin-window GM, preferable for large quantities, otherwise use an LSC, except for Tc-99	0.04	80
S-35, 50 keV, 100%		Similar to above	
Ca-45, 70 keV, 100%		Similar to above	
P-33, 77 keV, 100%		Similar to above	
Tc-99, 101 keV, 100%	Thin-window GM	0.1	200
Medium-energy beta emitters			
Cl-36, 279 keV, 98%	Thin-window GM	0.20	400
High-energy beta emitters			
Sr/Y-90, 565 keV, 200%	Thin-window GM	0.25	500
P-32, 695 keV, 100%		Similar to above	
Low-energy photons			
I-125, 27-35keV, 147% I-129, 29-40keV, 78%	Thin-crystal NaI scintillator probe	0.20	400
Medium-energy photons			

Co-57, 122 keV, 86%	Gamma scintillator, 1x1 or better 2x2	0.1 or 0.2 for 2x2	
136 keV, 11%		0.1 or 0.2 for 2x2	
Cr-51, 320 keV, 10%		Similar to above	