

## SECTION 5.10

### COMPENSATED GM DETECTOR CALIBRATION AND CHECK-OUT

#### 1.0 Purpose

To describe the procedures for calibration and operational check-out of energy compensated GM detectors.

#### 2.0 Responsibilities

- The site coordinator is responsible for assuring that this procedure is implemented.
- Survey team personnel are responsible for following this procedure.

#### 3.0 Procedure

##### 3.1 Equipment

- ✓ Portable ratemeter-scaler: Model PRS-1 (Rascal), Eberline Instrument Corporation; or equivalent.
- ✓ Energy compensated GM detector: Model HP-270, Eberline Instrument Corporation; or equivalent.
- ✓ Cable: CP1-BNC; or other connectors, as applicable.
- ✓ Record forms.
- ✓ Calibration source.
- ✓ Check source.

##### 3.2 Instrument/Detector Assembly and Electronic Set-Up

3.2.1 Attach the detector (shield closed) to a portable ratemeter-scaler.

3.2.2 Turn on, check batteries, and replace if necessary.

3.2.3 Adjust high voltage to 900 V and threshold to 5 (50 mV).

### 3.3 Operational Check-Out

- 3.3.1 Determine background for 5 minutes and calculate background count rate. Record the value on the Calibration Data Form (Figure B-4 or equivalent).
- 3.3.2 Cross-calibration can be performed; as for gamma scintillation detectors, see Section 5.3, items 3.2.8.1 to 3.2.8.6. Calibration for exposure rates at levels exceeding the capability of the PIC can be performed under the direction of staff health physicists and the ORISE Environmental Safety and Health office. Record information on the Cross Calibration Form (Figure B-3 or equivalent) or the Exposure Rate Calibration Data Form (Figure B-21 or equivalent).
- 3.3.3 Determine check source reproducibility by positioning a gamma check source (Co-60 or Cs-137) on the side of the detector and determine and record the count rate on the Calibration Form (Figure B-4 or equivalent). Repeat 10 times and calculate average and  $2\sigma$  and  $3\sigma$  deviation. Record check source range.

**NOTE:** Check source and form are to accompany the calibrated instrument to the field survey site.

- 3.3.4 Prepare an Instrument Operational Check-out Form (Figure B-1 or equivalent) entering the background and average check source counting rates on the first data line.

**NOTE:** This form accompanies the instrument to the survey site.

- 3.3.5 Daily instrument operational check-out is performed according to Section 5.1.