

## APPENDIX G

### CALIBRATION OF RADIATION DETECTION INSTRUMENTS

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#### RADIATION SURVEY INSTRUMENTS

Radiation survey instruments must be calibrated at intervals not to exceed twelve months and after each maintenance or servicing of the instrument, except for battery changes. The calibration must be sensitive enough to insure the instrument detects radiation emitted from the radioactive material possessed and used by the licensee and must meet all survey requirements identified in the Rules and Regulation for Control of Sources of Ionizing Radiation, Paragraph RH-1300 and Paragraph RH-8402. The survey instrument must be calibrated on all required scale readings up to 1000 millirem per hour with a radiation source.

- A. Calibration of survey instruments shall be performed using radioactive material (electronic calibration is not acceptable):
1. The calibration source activity or dose rates at specified distances shall be traceable to a standard certified to within  $\pm 5$  percent accuracy to a primary radiation standard such as those maintained by the U.S. National Institute for Standards and Technology (NIST).
  2. The calibration source shall approximate a point source.
  3. For linear scale instruments, each scale of the instrument shall be calibrated on at least two points located at approximately 1/3 and 2/3 of full scale; for logarithmic scale instruments, each scale shall be calibrated at midrange for each decade and at two points on at least one decade; and for digital instruments at three points between 2 and 1000 millirem per hour.
  4. For dose rate instruments, the instrument shall be calibrated so that an accuracy within plus or minus 20 percent of the calibration source can be demonstrated at each point.
  5. The date of calibration shall be conspicuously noted on the instrument.
- B. Records of radiation survey instrument calibration shall be maintained on file for inspection purposes and shall be retained for at least 3 years following the date the record was created.
- C. Radiation survey instruments shall be checked for operability to verify the instrument is working properly. The Licensee shall check each radiation survey instrument with a dedicated check source before each use.

If any reading with the same geometry is not within 20 percent of the reading obtained immediately after calibration, the instrument should be recalibrated.

**RADIATION DETECTION INSTRUMENTS TO MEASURE DOSAGES OF UNSEALED  
RADIOACTIVE MATERIAL**

Equipment used to measure dosages must be calibrated in accordance with nationally recognized standards (e.g., ANSI) or the manufacturer's instructions. The measurement equipment may be a well ion chamber, a liquid scintillation counter, etc., as long as the instrument can be calibrated appropriately and is both accurate and reliable.

The Applicant must confirm on Form G-2 that the radiation detection instruments used to measure dosages of unsealed radioactive material will be calibrated in accordance with nationally recognized standards or the manufacturer's instructions.

## Appendix G

### Form G-1

#### CALIBRATION OF RADIATION SURVEY INSTRUMENTS

Please provide the requested information by checking the appropriate items or completing the information in the space provided. The completed Form G-1 is a commitment by the Applicant to perform the radiation survey instrument calibration as indicated.

#### **RADIATION SURVEY INSTRUMENTS WILL BE CALIBRATED AS INDICATED**

\_\_\_\_\_ 1. Survey instruments will be calibrated at intervals not to exceed twelve months and following each maintenance and repair activity, except battery change.

\_\_\_\_\_ 2. Calibration will be performed as follows:

- a. For linear scale instruments, each scale of the instrument shall be calibrated on at least two points located at approximately 1/3 and 2/3 of full scale
- b. For logarithmic scale instruments, each scale shall be calibrated at midrange for each decade and at two points on at least one decade
- c. For digital instruments at three points between 2 and 1000 millirem per hour.

3. Radiation survey instrument calibration will be performed by:

\_\_\_\_\_ a. SERVICE VENDOR OR INSTRUMENT MANUFACTURER

Name of Company\_\_\_\_\_

Address of Company\_\_\_\_\_

Arkansas Vendor Registration Number\_\_\_\_\_

Licensee Operating Procedure Number\_\_\_\_\_

\_\_\_\_\_ **b. CONSULTANT**

**Name of Company**\_\_\_\_\_

**Address of Company**\_\_\_\_\_

**Arkansas Vendor Registration Number**\_\_\_\_\_

**Licensee Operating Procedure Number**\_\_\_\_\_

\_\_\_\_\_ **c. LICENSEE (Applicant)**

**(1.) Calibration Source**

**Radioactive Material**\_\_\_\_\_

**Activity (millicuries)**\_\_\_\_\_

**Manufacturer's Name**\_\_\_\_\_

**Source Model Number**\_\_\_\_\_

**Traceability to Primary Standard**\_\_\_\_\_

**Accuracy**\_\_\_\_\_

**Title Of Individual Performing**

**Calibration**\_\_\_\_\_

**(2.) Calibration procedures, including radiation safety procedures are included in Item 22:**

**YES**\_\_\_\_\_ **Operating Procedure Number**\_\_\_\_\_

**NO** \_\_\_\_\_ **(Explain)**\_\_\_\_\_

**Appendix G**

**Form G-2**

**CALIBRATION OF RADIATION DETECTION INSTRUMENTS**  
**TO**  
**MEASURE UNSEALED RADIOACTIVE MATERIAL**

**This confirms that radiation detection instruments used to measure dosages of unsealed radioactive material will be calibrated in accordance with nationally recognized standards or the instrument’s manufacturer’s calibration instructions. The completed Form G-2 is a commitment by the Applicant to perform the radiation detection instrument calibration as indicated.**

**A copy of each calibration procedure is included in Item 22, Operating Procedures of the Application.**

**Operating Procedure Numbers:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**CONFIRMATION**

\_\_\_\_\_  
**(Printed Name)**

\_\_\_\_\_  
**(Signature)**

\_\_\_\_\_  
**(Title)**

\_\_\_\_\_  
**(Date)**