Bicron/Thermo Scientific Micro Rem Meter Operation and Source Checks

Tank Farm Plant Operating Procedure

USQ # N/A-4

CHANGE HISTORY (≤ LAST 5 REV-MODS)

<table>
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<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
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<th>Summary of Changes</th>
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<tr>
<td>D-5</td>
<td>11/09/2016</td>
<td>RadCon Request</td>
<td>Modified step 5.2.4.2. and updated Records section.</td>
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<td>D-4</td>
<td>09/01/2016</td>
<td>PER</td>
<td>Updated Records section to current standard.</td>
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<td>D-3</td>
<td>06/23/2016</td>
<td>Inconsequential Change</td>
<td>Changed Record Section back to original at Radcon’s request.</td>
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<td>D-2</td>
<td>06/13/2016</td>
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<td>Changed Record Section to met Standard</td>
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<td>D-1</td>
<td>08/07/2015</td>
<td>Radcon Request</td>
<td>Added 4th bullet under 4.2, Add Note prior to Step 5.2.1. Add Step 5.2.4 with sub-steps. Struck Notes, Receipt Test and Special Instructions prior to Step 5.2.1. Reworded Records Section.</td>
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# Bicron/Thermo Scientific Micro Rem Meter Operation and Source Checks

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides specific information regarding the Bicron/Thermo Scientific Micro Rem Meter.

1.2 Scope

This procedure provides instruction for operating and performing operational and source checks of the Bicron/Thermo Scientific Micro Rem Meter.

2.0 INFORMATION

2.1 General Information

2.1.1 Specific information regarding theory of operation, calibration, maintenance and instrument specifications and limitations, including environmental and interfering radiation can be found in MA-562, Radiation Protection Instrument Manual (or equivalent).

2.1.2 The X0.1 and the X1000 ranges are not used to quantify dose rates because an effective source check method is not available for these ranges. These ranges may be used for scanning purposes or making relative (comparative) measurements. Measurements required in the X1000 range can be made using a Cutie Pie (CP) Eberline RO-3B rate meter, RO20, or other approved ion chamber dose rate meter.

2.1.3 An inspection of the instrument is required before each intermittent use of the Bicron/Thermo Scientific Micro Rem Meter.

2.1.4 An initial source check (receipt test) is performed when the instrument is first received from the calibration facility.

2.2 Terms and Definitions

GCS - Gamma Calibration Source.
3.0 **PRECAUTIONS AND LIMITATIONS**

3.1 **Radiation and Contamination Control**

3.1.1 The Micro Rem Meter is only used to quantify radiation levels in uniform radiation fields (i.e., at $\geq 30$ cm). Contact or small source radiation readings may only be used for trending or informational purposes. However, the Micro Rem Meter may be used to perform contact measurements of waste containers, as requested by Waste Services. These contact measurements may not be used for radiological control purposes.

3.2 **Equipment Safety**

3.2.1 This instrument is suitable for both indoor and outdoor use and is to be used within the temperature range of -4 °F to 122 °F and a maximum relative humidity of less than 95%.

4.0 **PREREQUISITES**

4.1 **Special Tools, Equipment, and Supplies**

The following supplies may be needed to perform this procedure:

- Gamma Calibration Source (GCS), also referred to as Micro Rem Meter check source assembly
- 9-volt alkaline batteries
- Other tools, equipment, and supplies as identified by Shift Manager/OE/FWS.

4.2 **Performance Documents**

The following documents may be needed to perform this procedure:

- A-6002-895, Daily Instrument Source Check Log
- BL-6006-213, Daily Source Check Label
- BT-6002-880, Instrument Service Tag
5.0 PROCEDURE

5.1 Operational Check

5.1.1 CONFIRM calibration of the instrument is current.

5.1.2 CONFIRM instrument source check is current (See Section 5.2).

5.1.3 INSPECT instrument for the following physical defects:
   • Broken meter glass
   • Loose knobs
   • Any other observable defects that would affect operation.

5.1.4 TURN the selector switch to “BAT” AND CONFIRM meter reading is within “BAT OK” check band.

5.1.5 IF battery check indicates below the “BAT OK” check band, REQUEST an Instrument Technician replace 9-Volt batteries.

5.1.5.1 PRIOR to use, PERFORM a daily source check per Section 5.2.

5.1.6 TURN selector switch to “HV OK” AND CONFIRM meter reading is within “HV OK” check band.

5.1.7 IF instrument fails “HV OK” check, TAG it with a complete Instrument Service Tag, (BT-6002-880) AND RETURN it to the calibration facility for servicing.
5.1 Operational Check (Cont.)

5.1.8 TURN selector switch to “X0.1,” AND
CONFIRM instrument responds to ambient background radiation.

5.1.9 IF instrument fails any of checks, TAG it with a complete Instrument Service Tag, (BT-6002-880) AND
RETURN it to the calibration facility for servicing.

5.1.10 IF the Instrument Service Tag was installed in error, PERFORM the following steps:

5.1.10.1 CONFIRM the instrument passes all required operational checks.

5.1.10.2 OBTAIN concurrence from the First Line Manager to place the instrument back into service.

5.1.10.3 REMOVE the blue tag.

5.1.10.4 PLACE the instrument back in service.
5.2 Source Check

Initial Source Check

NOTE - The initial source check is performed when the instrument is first received from the Calibration Laboratory.

5.2.1 PLACE Micro Rem Meter on check source assembly.

5.2.2 MOVE the source to the appropriate position for the X1, X10, X100 ranges of the instrument AND

ALLOW instrument’s reading to stabilize on each range.

5.2.3 OBSERVE the instrument’s response on each range.

5.2.4 EVALUATE initial source response as follows:

5.2.4.1 IF response is within +/- 20% of the mean or typical instrument response for that source (3-5 instruments), OR

IF response is within +/- 20% of source strength as determined for the source by a source calibration provider, proceed to 5.2.4.2a.

5.2.4.2 IF response is not within +/- 20% of the mean or typical instrument response for that source, OR

a. IF response is not within +/- 20% of source strength as determined for the source by a source calibration provider, PERFORM the following: IF reading is high out-of-range, CONTACT the Instrument FPOC for evaluation for continued use.

b. IF the reading is low out-of-range or Instrument FPOC determines not acceptable for continued use, THEN:

1. TAG the instrument with a completed instrument service tag (BT-6002-880) identifying the problem(s).

2. SEGREGATE the instrument to prevent inadvertent use.

3. NOTIFY RadCon management.
5.2 Source Check (Cont.)

5.2.5 MULTIPLY the instrument’s response by 0.8 and 1.2 to determine the acceptable range for that instrument AND RECORD the acceptable range on the Daily Instrument Source Check Log (A-6002-895).

5.2.6 COMPLETE the remainder of the Daily Instrument Source Check Log.

5.2.7 IF the response is acceptable, ATTACH AND COMPLETE a Daily Source Check label (BL-6006-213) to Bicron/Thermo Scientific Micro Rem Meter.

5.2.8 IF instrument fails the initial source check, TAG it with a completed Instrument Service Tag (BT-6002-880) AND RETURN instrument to calibration facility for service.

5.2.9 IF the Instrument Service Tag was installed in error, PERFORM the following steps:

5.2.9.1 CONFIRM the instrument passes all required operational checks.

5.2.9.2 OBTAIN concurrence from the First Line Manager to place the instrument back into service.

5.2.9.3 REMOVE the blue tag.

5.2.9.4 PLACE the instrument back in service.

Daily Source Check

5.2.10 PLACE Micro Rem Meter on check source assembly.

5.2.11 SELECT range to be tested with range selector switch.

5.2.12 MOVE source to the appropriate position.

5.2.13 ALLOW instrument’s reading to stabilize AND COMPARE the reading to the acceptable range in the Daily Instrument Source Check Log (A-6002-895).
5.2 Source Check (Cont.)

5.2.14 **REPEAT** Steps 5.2.11 through 5.2.13 for each range to be source checked.

5.2.15 **COMPLETE** the Daily Instrument Source Check Log (A-6002-895).

5.2.15.1 **IF** instrument passed, **COMPLETE** Daily Source Check label (BL-6006-213).

5.2.15.2 **IF** instrument failed source check, **TAG** it with a complete Instrument Service Tag, (BT-6002-880) **AND**

**RETURN** it to the calibration facility.

5.2.16 **IF** the Instrument Service Tag was installed in error, **PERFORM** the following steps:

5.2.16.1 **CONFIRM** the instrument passes all required operational checks.

5.2.16.2 **OBTAIN** concurrence from the First Line Manager to place the instrument back into service.

5.2.16.3 **REMOVE** the blue tag.

5.2.16.4 **PLACE** the instrument back in service.
5.3 Operating Instructions

5.3.1 **PERFORM** Section 5.1 prior to using instrument.

5.3.2 **IF** damage to instrument is suspected during survey (e.g., instrument is dropped), **PERFORM** either of the following steps:

5.3.2.1 **CHECK** instrument against a previous reading or an established well-known, constant, non-zero field **AND**

**CONFIRM** response is within ± 20%.

5.3.2.2 **IF** an established field is not available, **PERFORM** the Daily Source Check per Section 5.2.

5.3.3 **TURN** the instrument’s selector switch to the desired range (X1, X10, or X100) **AND**

**MOVE** the instrument slowly near sources of radiation.

5.3.4 **WHEN** quantifying radiation levels, **ALLOW** instrument meter to stabilize before recording instrument’s response.
5.4 Records

5.4.1 **PERFORM** the following for records identified within this procedure.

5.4.1.1 On the Records Submittal Checklist, **RECORD** the number of pages that were completed

**OR**

**PLACE** a check mark (✓) in the N/A column.

5.4.1.2 **ATTACH** the completed records to the Records Submittal Checklist **AND**

**SIGN** Records Submittal Checklist indicating the package is complete.

5.4.1.3 **SUBMIT** the completed records to an approved RadCon Record Storage Area for retention.

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS), is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.

<table>
<thead>
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<th>Records Submittal Checklist</th>
<th>Number of pages completed</th>
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<td>Site Form A-6002-895, Daily Instrument Source Check Log</td>
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________________________________________/________________________________________/__________

Signature                                      Print (First and Last Name)         Date

First Line Manager (or designee)