Thermo Fisher Scientific Matrix RMU and VP SaT™
Operation and Source Checks

Tank Farm Plant Operating Procedure

CHANGE HISTORY (≤ LAST 5 REV-MODS)

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
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<tr>
<td>C-5</td>
<td>11/29/2018</td>
<td>Field Change to address WRPS-</td>
<td>This revision contains a change to direct an independent</td>
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<td>PER-2018-2214.</td>
<td>verification of alarm set points and provides clearer directions</td>
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<tr>
<td></td>
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<td>for program actions</td>
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<tr>
<td>C-4</td>
<td>07/06/2017</td>
<td>RadCon Request</td>
<td>Included direction into Section 2.2 and Step 5.3.17 that involves</td>
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<tr>
<td></td>
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<td></td>
<td>the use of ViewPoint Software Project.</td>
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<tr>
<td>C-3</td>
<td>09/01/2016</td>
<td>PER</td>
<td>Updated Records section to current standard.</td>
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<td>C-2</td>
<td>06/14/2016</td>
<td>Inconsequential Change</td>
<td>Changed Record Section to meet Standard.</td>
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<td>02/25/2016</td>
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<td>deleted 5.1.3.4changed 5.1.20.5, 5.1.20.10, 5.1.20.11, 5.5.8.5,</td>
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<td>&amp; changed table 5</td>
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Operation and Source Checks

1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides specific information regarding the use and source check of the Thermo Fisher Scientific Matrix RMU (Radiation Measurement Unit) and VP SaT™ console.

1.2 Scope

This procedure provides instruction for operation and performing response source checks of a Thermo Fisher Scientific Matrix RMU and VP SaT™ console used to provide remote area radiation monitoring at multiple locations.

2.0 INFORMATION

2.1 General Information

2.1.1 The RMU and VP SaT™ console form a system that provides remote area radiation monitoring of radiological conditions in the near vicinity of waste retrieval/transfer activities and notify personnel of abnormal radiological conditions. A Thermo Fisher Scientific Mk 2.3 Electronic Personnel Dosimeter (EPD) is contained within the Matrix RMU and is the radiation sensor and processor for the radiation.

2.1.2 Specific information regarding setup of the Thermo Fisher Scientific Mk 2.3 EPD used in the Matrix RMU can be found in TF-RC-033.

2.1.3 Field maintenance personnel will typically install mounting racks designed to provide a stable and safe platform for the operation of the Matrix RMUs in the Hanford outdoor environment. Maintenance will install the RMU enclosure containing the CNET1000 and EPD adaptor to the racks and will install a recently charged 12-volt 55 amp-hour rechargeable sealed battery in the enclosure. Maintenance will notify Rad Con when installation is complete.

2.1.4 When directed by the ViewPoint Software Project Lead, this procedure is also used to perform in-use testing as required by the ViewPoint Software Management Plan, RPP-PLAN-61533

2.2 Terms and Definitions

- CNET1000: RMU Radio Transmitter
- EPD: Electronic Personnel Dosimeter
- RMU: Radiation Measurement Unit
- VP SaT™ Console: View Point Stand Alone Terminal.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - The RMU audio alarm sounds at 80 to 101 decibels, which may cause auditory injury.

3.1.1 Job-specific protective equipment requirements should be addressed during the pre-job brief and be in accordance with TFC-ESHQ-S_IS-C-02.

3.2 Radiation and Contamination Control

3.2.1 When work is performed in or when work will result in a high contamination, high radiation, or an airborne radioactivity area, an approved work package must be developed which is reviewed by Radiological Control per ALARA work planning procedure TFC-ESHQ-RP_RWP-C-03.

3.2.2 This procedure calls for the use of an accountable, radioactive source to perform response source checks. Ensure that a source custodian or designated source custodian delegate is available for source check out and return.

4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following equipment is needed to perform this procedure:
- Matrix RMU (containing a calibrated Mk 2.3 EPD)
- VP SaT™ Console (running the ViewPoint™ software)
- $^{137}\text{Cs}$, Check Source # GE 650.

The following supplies may be needed to perform this procedure:
- Hearing protection
- One AA Lithium Thionyl Chloride (LTC) 3.6 volt battery
- Replacement calibrated Mk 2.3 EPD setup for Matrix RMU use, (if response check fails)
- Access to EASYEPD2 EPD Mk2 Configuration Software and EPD Ir Adapter, both typically installed on the VP SaT™ Console.
4.2 Performance Documents

The following documents are needed to perform this procedure:

- A-6004-432, Area Radiation Monitor Source Response Check Log
- BT-6002-880, Instrument Service Tag
- Thermo Scientific Matrix RMU Quick Start Guide, P/N SYS/HB/70775/510
- Thermo Scientific ViewPoint™ User Handbook, P/N SYS/HB/700000/000
- Siemens Electronic Personal Dosimeter (EPD Mk2) Technical Handbook, P/NEPD/HB/40521/000
- Thermo Electron Corporation EASYEPD2 EPD Mk2 Configuration Software, P/N EPD/HB/40572/000
5.0 PROEDURE

5.1 Placing a Matrix RMU in Service

5.1.1 OBTAIN the number of EPDs required for the number of RMU enclosures installed for a particular project.

5.1.2 CONFIRM the EPDs calibration is current, by examining the attached calibration sticker.

5.1.3 SET UP the EPD(s) using the Easy EPD2 software and IrDA reader (contained in the VP SaT™ unit or other locations) as follows:

5.1.3.1 START UP Easy EPD by double-clicking the Easy EPD icon on the computer.

5.1.3.2 INSERT an EPD into the IrDA reader AND CONFIRM the “Dose and Alarms” window is displayed.

5.1.3.3 SET UP the EPD Alarms as outlined in the following table.

<table>
<thead>
<tr>
<th>Dose Alarm Thresholds</th>
<th>Rate Alarm OFF</th>
<th>Thresholds ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>mrem</td>
<td>mrem/hr</td>
<td>mrem/hr</td>
</tr>
<tr>
<td>Hp 10 (1)</td>
<td>99999</td>
<td>*</td>
</tr>
<tr>
<td>Hp 10 (2)</td>
<td>99999</td>
<td>99999</td>
</tr>
<tr>
<td>Hp 07</td>
<td>99999</td>
<td>99999</td>
</tr>
</tbody>
</table>

*Setpoints are to be set to the levels required in specific documents, technical work documents, or RWP

5.1.3.4 CLICK “Write to EPD” icon on the tool bar.
5.1 Placing a Matrix RMU in Service (Cont.)

5.1.4 CLICK the “Setup EPD Events” icon on the tool bar.

5.1.4.1 CHANGE “Return for Read Time” setting as follows: (Changing the “Return for Read Time” setting as shown will notify the VP SaT™ operator that the EPD is coming due for calibration with a status indication of “Return for Read”.)

a. SET date to one (1) Week before the calibration due date located on the Calibration Sticker.

b. USE format as given: “mm/dd/ccyy 12:01:00 pm”.

5.1.4.2 CLICK “Write to EPD” icon on the tool bar.

5.1.4.3 CLICK “Close” on the “Events Set-up”.

5.1.5 CLICK “Set-up EPD Comms” icon on the tool bar AND ENSURE the EPD has the following settings:

- Teledosimetry- On- Regular Tx
- Baud Rate - 9600
- Regular Transmit Set Up/Randomise Tx Time- 80 Ms
- Regular Transmit Set Up/Min Tx Interval- 10 Secs (If the Min Tx interval is set to a large value, the alarm notifications will be delayed. Ten seconds is the manufacturer’s recommended optimum value for this setting.)
- Regular Transmit Set Up/Dose Tx Increment- 0.1 mRem
- Regular Transmit Set Up/Max Tx Intervals- 1.
5.1 Placing a Matrix RMU in Service (Cont.)

5.1.5.1 CLICK “Write to EPD” icon on the tool bar.

5.1.5.2 CLICK “Close” on the “Comms Setup”.

5.1.5.3 REPEAT Steps 5.1.3 thru 5.1.5.2 for each EPD needed for the Particular Project.

5.1.5.4 EXIT Easy EPD.

NOTE - Steps 5.1.6 through 5.1.14 maybe completed at the same time as Steps 5.1.15 through 5.1.31.

5.1.6 OPEN the Matrix RMU enclosure.

5.1.7 ENSURE EPD is turned ON.

5.1.8 INSTALL the EPDs in the Matrix RMU in the EPD teleadapter shoe by pressing the EPD up into the shoe until it clicks into place.

5.1.9 INFORM personnel in area that an ALARM Test is being performed and that Matrix RMU is expected to alarm.

5.1.10 TURN the power switch ON (up position).
5.1 Placing a Matrix RMU in Service (Cont.)

**WARNING**
The RMU audio alarm sounds at 80 to 101 decibels, which may cause auditory injury.

5.1.11 **DON** hearing protection.

5.1.12 **DEPRESS AND HOLD** the ALARM Test Button on the CNET1000 box **AND**

**CHECK** the following:
- Fault LED illuminates
- External strobe light blinks brightly
- Alarm sounder sounds loudly.

5.1.13 **REMOVE** your finger from the ALARM test button **AND**

**CHECK** the following:
- Fault LED is NOT illuminated
- External strobe light stops blinking
- Alarm sounder stops emitting a sound.

5.1.14 **IF** any portions of the test performed in Steps 5.1.12 and 5.1.13 fail, **TROUBLESHOOT AND REPLACE** failed items.

5.1.14.1 **REPEAT** Steps 5.1.11 and 5.1.13 following the replacement of a part, **OR NOTIFY** FLM for resolution if unit does not work.

5.1.15 **IF**, while performing Steps 5.1.16 through 5.1.29 difficulties are encountered or troubleshooting of the system is required, **REFER** to the VP SaT™ User Handbook.
5.1 Placing a Matrix RMU in Service (Cont.)

5.1.16 CONFIRM a VP SaT™ console is setup.

OR

SET UP the following:

5.1.16.1 PLUG Power cable to Laptop and a suitable A/C power receptacle.

5.1.16.2 OPEN VP SaT™ lid (cover) AND

CONNECT remote antenna if available.

5.1.16.3 ATTACH USB connector to the laptop.

5.1.16.4 TURN ON (I) the VP SaT™ power switch.

5.1.16.5 CHECK the laptop is powered up.

5.1.16.6 TURN ON (I) the external radio, or radio power (internal to VP SaT™) as appropriate.

5.1.16.7 TURN OFF (0) the radio that is not being used.

5.1.17 IF not already done, LOG on to Window™ XP.

5.1.18 IF not already done, START UP the ViewPoint Client.

5.1.19 LOG IN using the following information:

- Password - “HPT”
- User name - “ADMIN”.
5.1 Placing a Matrix RMU in Service (Cont.)

5.1.20 CLICK on “Computer Groups”, RIGHT CLICK AND SELECT “Create Group.”

5.1.20.1 ENTER name of group that you are creating.

5.1.20.2 SELECT CNET Device from the list of “Available Devices” AND

CLICK ADD to list this instrument type in the “Displayed Devices” column.

5.1.20.3 CLICK on CNET device.

5.1.20.4 UNDER the group device window “Displayed Devices,” CLICK Options.

5.1.20.5 AT the “Fields Displayed” column, REMOVE the following:
• Radio Firmware
• Pack ID
• Type
• Status
• Data Source (when available).

5.1.20.6 CLICK “OK”.

5.1.20.7 CLICK on the list of “Available Devices” AND

SELECT TeleTrak EPD2.

a. CLICK ADD to insert this instrument type in the “Displayed Devices” column.

5.1.20.8 CLICK on TeleTrak EPD 2.

5.1.20.9 UNDER the group device window “Displayed Devices,” CLICK Options.
5.1 Placing a Matrix RMU in Service (Cont.)

5.1.20.10 AT the “Fields Displayed” column, REMOVE the following:
- Cell Phone
- Clock
- D Dose
- D Dose Thresh
- In Date
- Resets
- RWPID
- S Dose
- S Dose Thresh
- S Rate
- S Rate Thresh
- Time Left
- Wearer ID
- WO
- Data Source (when available).

5.1.20.11 SELECT the “Popup Alarms” tab AND

MOVE the following list from the “Available Alarms” Column to the “Alarms that generate a Popup” Column by selecting an item and clicking “Add”.
- Connection Fail
- D Rate 1 (Latched)
- D Rate 2 (Latched)
- Detector Test Fail
- EEPROM Fail
- Error Logged
- Other Fault
- Radio Fail
- Rate Over Range
- Return for Read.
5.1 Placing a Matrix RMU in Service (Cont.)

5.1.20.12 CLICK “OK” to accept the Group Device parameters.

5.1.20.13 CLICK “OK” to establish the Group.

5.1.21 ESTABLISH graphic representation of RMU dose rate values on the VP SaT™.

5.1.21.1 SELECT each active TeleTrak EPD2 devices in the “Measurements window”.

5.1.21.2 RIGHT CLICK AND SELECT “Graph Device”.

5.1.21.3 CONFIRM all active TeleTrak EPD2 devices are displayed in the Graphs tab.

5.1.21.4 SELECT active Thermo EPD2 devices displayed as serial numbers on the right hand side of the Graphs screen.

5.1.21.5 RIGHT CLICK AND SELECT “Graph D Rate” from the dropdown menu.

5.1.22 CLICK on the Measurements tab.

5.1.23 ESTABLISH Text Log representation of RMU dose rate values on the VP SaT™.

5.1.23.1 SELECT each active TeleTrak EPD2 devices in the “Measurements Window”.

5.1.23.2 RIGHT-CLICK AND SELECT “Add to Text Log”.

5.1.23.3 CONFIRM all active TeleTrak EPD2 devices are displayed in the “Text Log Tab”.

5.1.24 CLICK on the “Measurements” tab.

5.1.25 ESTABLISH Graphs representative of RMU battery status on the VP SaT™.

5.1.25.1 SELECT each active CNET Devices in the “Measurement Window”.

5.1.25.2 RIGHT-CLICK AND SELECT “Graph Device”.
5.1 Placing a Matrix RMU in Service (Cont.)

5.1.25.3 CONFIRM all active CNET Devices are displayed in the Graphs tab.

5.1.25.4 SELECT active CNET Devices displayed as Serial Numbers on the right hand side of the Graph Screen.

5.1.25.5 RIGHT-CLICK AND SELECT “Graph Battery Voltage” from the drop down menu.

5.1.26 CLICK on “Measurements Tab”.

5.1.27 ESTABLISH Text Log representative of RMU battery status on the VP SaT™.

5.1.27.1 SELECT all active CNET Devices displayed in the “Measurements Window”.

5.1.27.2 RIGHT-CLICK AND SELECT “Add to Text Log”.

5.1.27.3 CONFIRM all active CNET devices are displayed in the “Text Log Tab”.

5.1.28 CLICK on the “Measurements” tab.

5.1.29 CONFIRM EPDs (Matrix RMU) are communicating with the VP SaT™ console by observing Report Time changes.

5.1.30 IF RMU has already been placed in service and meets any of the following conditions GO TO Section 5.3 AND

PERFORM a periodic source check:
- Intermittent use (each time the Matrix RMU is moved or turned ON)
- Following RMU 12 volt battery change out
- A minimum of quarterly during continuous use.

5.1.31 IF RMU is being placed in initial service GO TO Section 5.2 AND

PERFORM an initial source response check.
5.2 Initial Source Response Check

5.2.1 CONFIRM $^{137}$Cs, source is number GE650.

5.2.2 CONFIRM the VP SaT™ console is receiving radiological data transmissions from the Matrix RMU being tested by observing the report time is changing.

5.2.3 INITIATE form A-6004-432 for each RMU being tested by filling in the form header information as follows:

5.2.3.1 UNDER “Building”, RECORD the building, facility or other identified location where the Matrix RMU is being used.

5.2.3.2 UNDER “Frequency”, RECORD the required operational and source check test frequency (Quarterly at a minimum).

5.2.3.3 UNDER “Instrument/Detector Type” RECORD “Matrix RMU”.

5.2.3.4 UNDER “Instrument/Detector Number” RECORD the appropriate EPD barcode/serial number (e.g., EDTC1-0167/185312).

5.2.3.5 UNDER “Instrument Cal Due Date” RECORD the Cal Due Date on the calibration sticker attached to the EDP.

5.2.3.6 UNDER “Source Used” RECORD the serial number of the $^{137}$Cs check source, # GE650.

5.2.4 USING the VP SaT™ console, SET the Matrix RMU “D Rate” alarm set-point to a level where the check source will raise the dose rate above the set-point as follows:

5.2.4.1 ENSURE all active EPDs are logged on.

a. IF all active EPDs are not logged on, COMPLETE Steps 5.4.6 through 5.4.9.4.

5.2.4.2 PLACE the cursor over the EPD being tested.

5.2.4.3 RIGHT CLICK the mouse to open the TeleTrak EPD2 (S/N), window.

5.2.4.4 SELECT “Set Alarm Thresholds”.
5.2 Initial Source Response Check (Cont.)

5.2.4.5 SET the alarms as shown in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Function</th>
<th>S/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>D Dose Alarm 1</td>
<td>99999</td>
</tr>
<tr>
<td>D Dose Alarm 2</td>
<td>99999</td>
</tr>
<tr>
<td>S Dose Alarm</td>
<td>99999</td>
</tr>
<tr>
<td>D Rate Alarm 1 On</td>
<td>7 *</td>
</tr>
<tr>
<td>D Rate Alarm 2 On</td>
<td>99999*</td>
</tr>
<tr>
<td>S Rate Alarm On</td>
<td>99999</td>
</tr>
<tr>
<td>D Rate Alarm 1 Off</td>
<td>5 *</td>
</tr>
<tr>
<td>D Rate Alarm 2 Off</td>
<td>99998</td>
</tr>
<tr>
<td>S Rate Alarm Off</td>
<td>99998</td>
</tr>
</tbody>
</table>

*Setpoint may be adjusted as necessary.

5.2.4.6 CLICK “OK”.

5.2.4.7 CONFIRM Setpoints have been transmitted by clicking “OK” when the Information popup showing “Operation succeeded” is displayed

OR

IF “Operation Failed” is displayed, CLICK “OK” AND

REPEAT Steps 5.2.4.1 through 5.2.4.7 until “Operation Succeeded” is displayed.

5.2.4.8 IF nothing is displayed, REPEAT Steps 5.2.4.1 through 5.2.4.7 until “Operation Succeeded” is displayed.

5.2.4.9 NOTIFY FLM for resolution if unit does not work.

5.2.4.10 CLICK “OK”.

5.2.5 INFORM personnel in area that source check of instrument is being performed and that Matrix RMU is expected to alarm.
5.2 Initial Source Response Check (Cont.)

**WARNING**
The RMU audio alarm sounds at 80 to 101 decibels, which may cause auditory injury.

5.2.6 **DON** hearing protection.

5.2.7 **PLACE** the check source in contact with the underside of the Matrix RMU just below the EPD **AND**

**ALLOW** the instrument’s reading to stabilize. (Three (3) to four (4) transmittal intervals (30 to 40 seconds) may have to pass to obtain a stable reading.).

5.2.8 **CONFIRM** that the audible alarm sounds and the visual alarm flashes at the Matrix RMU.

5.2.9 **RECORD** the DOSE RATE reading as displayed on the VP SaT™ console, on Form A-6004-432 in the Initial Reading (mR/hour) space.

5.2.10 **REMOVE** the check source from the underside of the Matrix RMU.

5.2.11 **ACKNOWLEDGE** the alarms at the VP SaT™ console as follows:

5.2.11.1 **CLICK** “Clear” on the alarm popup window.

5.2.11.2 **ALLOW** the alarming EPD to register dose rates below the alarm “Off threshold” (usually take 30 to 40 seconds).

5.2.11.3 **PLACE** the cursor over the EPD being tested **AND**

**RIGHT CLICK** the mouse to open the TeleTrak EPD2 (S/N), window.

5.2.11.4 **SELECT** “Clear Latched Alarms”.

5.2.11.5 **CLICK** “YES” on the Confirm popup.
5.2 Initial Source Response Check (Cont.)

5.2.11.6 CONFIRM Information popup displays “Operation succeeded” AND CLICK “OK”,

OR

IF “Operation Failed” is displayed, CLICK “OK” AND

REPEAT Steps 5.2.11.1 thru 5.2.11.6 as necessary until “Operation Succeeded” is displayed

5.2.11.7 IF nothing is displayed, REPEAT Steps 5.2.11.1 through 5.2.11.6 until “Operation Succeeded” is displayed.

5.2.11.8 NOTIFY FLM for resolution if unit does not work.

CAUTION

Failure to cycle the DC breaker will prevent the Matrix RMU from re alarming until a 45-minute reset function cycle has completed internally.

5.2.12 TURN the RMU “off” and then back “on” by cycling the DC breaker to reset the alarm inside the Matrix RMU housing.

5.2.13 CONFIRM the visual and audible alarms clear on the Matrix RMU.

5.2.14 CALCULATE the ± 20% of initial reading acceptance values AND

RECORD those values in the Initial Reading block on Form A-6004-432.

5.2.15 USING the VP SaT™ console, RETURN Matrix RMU “D Rate Alarm 2” ON and OFF Set-Points to values in accordance with project specific documents, technical work document(s), or Radiological Work Permit (RWP).

5.2.15.1 PLACE the cursor over the EPD being tested.

5.2.15.2 RIGHT CLICK the mouse to open the TeleTrak EPD2 (S/N), window.

5.2.15.3 SELECT “Set Alarm Thresholds”.
5.2 Initial Source Response Check (Cont.)

5.2.15.4 SET the alarms as shown in Table 2.

Table 2

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>SET POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>D Dose Alarm 1</td>
<td>99999</td>
</tr>
<tr>
<td>D Dose Alarm 2</td>
<td>99999</td>
</tr>
<tr>
<td>S Dose Alarm</td>
<td>99999</td>
</tr>
<tr>
<td>D Rate Alarm 1 On</td>
<td>Restore</td>
</tr>
<tr>
<td>D Rate Alarm 2 On</td>
<td>99999</td>
</tr>
<tr>
<td>S Rate Alarm On</td>
<td>99999</td>
</tr>
<tr>
<td>D Rate Alarm 1 Off</td>
<td>Restore</td>
</tr>
<tr>
<td>D Rate Alarm 2 Off</td>
<td>99998</td>
</tr>
<tr>
<td>S Rate Alarm Off</td>
<td>99998</td>
</tr>
</tbody>
</table>

5.2.15.5 CLICK “OK”.

5.2.15.6 CONFIRM setpoints have been transmitted by clicking “OK” when the Information popup showing “Operation succeeded” is displayed.

OR

IF “Operation Failed” is displayed, CLICK “OK” AND

REPEAT Steps 5.2.15.1 thru 5.2.15.6 until “Operation Succeeded” is displayed.

5.2.15.7 IF nothing is displayed, REPEAT Steps 5.2.15.1 thru 5.2.15.6 until “Operation Succeeded” is displayed.

5.2.15.8 NOTIFY FLM for resolution if unit does not work.

5.2.15.9 CLICK “OK”.

5.2.15.10 At the Matrix RMU PERFORM an independent alarm setpoint verification of the EPD.
5.2 Initial Source Response Check (Cont.)

5.2.16 IF the Matrix RMU fails the Initial source check PERFORM the following:

5.2.16.1 REMOVE the EPD from the Matrix RMU.

5.2.16.2 TAG the EPD with a complete Instrument Service Tag (BT-6002-880).

5.2.16.3 RETURN instrument to calibration facility for service.

5.2.16.4 REPLACE the failed EPD with a calibrated EPD.

5.2.16.5 PERFORM Section 5.4 to Log off/on EPDs.

5.2.17 IF it is determined that the Instrument Service Tag was installed in error, PERFORM the following:

5.2.17.1 CONFIRM the instrument passes all required operational checks.

5.2.17.2 OBTAIN concurrence from the First Line Manager (FLM) to place instrument back in service.

5.2.17.3 REMOVE the Instrument Service Tag.

5.2.17.4 PLACE instrument back in service.
5.3 Periodic Source Check

5.3.1 CONFIRM the VP SaT™ console is receiving radiological data transmissions from the Matrix RMU being tested.

5.3.2 RECORD the RMU background reading in the ARM background reading column of form A-6004-432.

5.3.3 RECORD the RMU D Rate Alarm 2 ON and OFF alarm set-point in the ASP column of form A-6004-432 in format; XX/XX (e.g., 30/28 (ON/OFF).

5.3.4 USING the VP SaT™ console, SET the Matrix RMU “D Rate” alarm set-point to a level where the check source will raise the dose rate above the set-point by the following:

5.3.4.1 ENSURE all active EPDs are logged on.
   a. IF all active EPDs are not logged on, COMPLETE Steps 5.4.6 through 5.4.9.4.

5.3.4.2 PLACE the cursor over the EPD being tested.

5.3.4.3 RIGHT CLICK the mouse to open the TeleTrak EPD2 (S/N), window.

5.3.4.4 SELECT Set Alarm Thresholds.
5.3 Periodic Source Check (Cont.)

5.3.4.5 SET the alarms as shown in Table 3.

**Table 3**

<table>
<thead>
<tr>
<th>Function</th>
<th>S/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>D Dose Alarm 1</td>
<td>99999</td>
</tr>
<tr>
<td>D Dose Alarm 2</td>
<td>99999</td>
</tr>
<tr>
<td>S Dose Alarm</td>
<td>99999</td>
</tr>
<tr>
<td>D Rate Alarm 1 On</td>
<td>7 *</td>
</tr>
<tr>
<td>D Rate Alarm 2 On</td>
<td>99999*</td>
</tr>
<tr>
<td>S Rate Alarm On</td>
<td>99999</td>
</tr>
<tr>
<td>D Rate Alarm 1 Off</td>
<td>5 *</td>
</tr>
<tr>
<td>D Rate Alarm 2 Off</td>
<td>99998</td>
</tr>
<tr>
<td>S Rate Alarm Off</td>
<td>99998</td>
</tr>
</tbody>
</table>

*Setpoint may be adjusted as necessary.

5.3.4.6 CLICK “OK”

5.3.4.7 CONFIRM setpoints have been transmitted by clicking “OK” when the Information popup showing “Operation succeeded” is displayed.

5.3.4.8 IF “Operation Failed” is displayed, CLICK “OK” AND REPEAT Steps 5.3.4.1 thru 5.3.4.7 as necessary until an “Operation Succeeded” is displayed

OR

IF nothing is displayed, REPEAT Steps 5.3.4.1 thru 5.3.4.7 until “Operation Succeeded” is displayed.

5.3.4.9 NOTIFY FLM for resolution if unit does not work.

5.3.4.10 CLICK “OK”.

5.3.5 INFORM personnel in area that source check of instrument is being performed and that Matrix RMU is expected to alarm.
5.3 Periodic Source Check (Cont.)

WARNING
The RMU audio alarm sounds at 80 to 101 decibels, which may cause auditory injury.

5.3.6 DON hearing protection.

5.3.7 PLACE the check source in contact with the underside of the Matrix RMU just below the EPD AND

ALLOW instrument’s reading to stabilize. (Three (3) to four (4) transmit intervals (30 to 40 seconds) may have to pass to obtain a stable reading.)

5.3.8 CONFIRM, at the Matrix RMU, that the audible alarm sounds, and the visual alarm flashes.

5.3.9 RECORD the DOSE RATE reading as displayed on the VP SaT™ console on Form A-6004-432 in the Response Column.

5.3.10 REMOVE the check source from the side of the Matrix RMU.

5.3.11 ACKNOWLEDGE the alarms at the VP SaT™ console.

5.3.11.1 CLICK “Clear” on the alarm popup window.

5.3.11.2 ALLOW the alarming EPD to register dose rates below the alarm “Off threshold”. (usually take 30 to 40 seconds.)

5.3.11.3 PLACE the cursor over the EPD being tested.

5.3.11.4 RIGHT CLICK the mouse to open the TeleTrak EPD2 (S/N), window.

5.3.11.5 SELECT “Clear Latched Alarms”.

5.3.11.6 CLICK Yes on the Confirm popup.

5.3.11.7 CONFIRM Information popup displays “Operation succeeded” AND

CLICK “OK”.

5.3 Periodic Source Check (Cont.)

5.3.11.8 IF “Operation Failed” is displayed, CLICK “OK” AND

REPEAT Steps 5.3.11.1 thru 5.3.11.7 as necessary until an “Operation Succeeded” is displayed

OR

5.3.11.9 IF nothing is displayed, REPEAT Steps 5.3.11.1 thru 5.3.11.7 until “Operation Succeeded” is displayed.

5.3.11.10 NOTIFY FLM for resolution if unit does not work.

CAUTION

Failure to cycle the DC breaker will prevent the Matrix RMU from re-alarming until a 45 minute reset function cycle is completed internally.

5.3.12 TURN the RMU “OFF” and then back “ON” by cycling the DC breaker to reset the alarm inside the Matrix RMU housing.

5.3.13 CONFIRM the visual and audible alarms clear on the Matrix RMU.

5.3.14 RECORD the following on Form A-6004-432:
• P (pass) or F (fail) status for ARM response reading is within the 20% range as identified in the Initial Reading Block
• P (pass) or F (fail) status for Alarms functioned properly at both the Matrix RMU and VP SaT™.

5.3.15 USING the VP SaT™ console, RETURN the Matrix RMU Alarm Set-Point to the As-Found value recorded in ASP column of form A-6004-432,

OR

SET to specified values in accordance with project specific documents, technical work document(s), or RWP.

5.3.15.1 PLACE the cursor over the EPD being tested.

5.3.15.2 RIGHT CLICK the mouse to open the TeleTrak EPD2 (S/N), window.

5.3.15.3 SELECT “Set Alarm Thresholds”.
5.3 Periodic Source Check (Cont.)

5.3.15.4 SET the alarms as shown in Table 4.

Table 4

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>SET POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>D Dose Alarm 1</td>
<td>99999</td>
</tr>
<tr>
<td>D Dose Alarm 2</td>
<td>99999</td>
</tr>
<tr>
<td>S Dose Alarm</td>
<td>99999</td>
</tr>
<tr>
<td>D Rate Alarm 1 On</td>
<td>Restore</td>
</tr>
<tr>
<td>D Rate Alarm 2 On</td>
<td>99999</td>
</tr>
<tr>
<td>S Rate Alarm On</td>
<td>99999</td>
</tr>
<tr>
<td>D Rate Alarm 1 Off</td>
<td>Restore</td>
</tr>
<tr>
<td>D Rate Alarm 2 Off</td>
<td>99998</td>
</tr>
<tr>
<td>S Rate Alarm Off</td>
<td>99998</td>
</tr>
</tbody>
</table>

5.3.15.5 CLICK “OK”.

5.3.15.6 CONFIRM setpoints have been transmitted by clicking “OK” when the Information popup showing “Operation succeeded” is displayed.

5.3.15.7 IF “Operation Failed” is displayed, CLICK “OK” AND REPEAT Steps 5.3.15.1 thru 5.3.15.6 as necessary until an “Operation Succeeded” is displayed.

5.3.15.8 IF nothing is displayed, REPEAT Steps 5.3.15.1 thru 5.3.15.6 until “Operation Succeeded” is displayed.

5.3.15.9 NOTIFY FLM for resolution if unit does not work.

5.3.15.10 CLICK “OK”.

5.3.15.11 At the Matrix RMU PERFORM an independent alarm setpoint verification of the EPD.
5.3 Periodic Source Check (Cont.)

5.3.16 RECORD the overall results of the test in the Operable column, either Y (Yes) the RMU passed or N (No) the RMU did not pass.

5.3.17 COMPLETE the record as follows:

5.3.17.1 RECORD today’s date in the “Date” block.

5.3.17.2 PRINT the RCT name in the RCT “Print Name” block.

5.3.17.3 SIGN your name in the “Signature” block.

5.3.17.4 IF this procedure is being used to perform the in-use testing as directed by the ViewPoint Software Project Lead, RECORD the computer property number, operating system, operating system version and ViewPoint version in the “Comments” block.

5.3.17.5 ENTER any additional comments in the “Comments” block, otherwise IF there are no comments ENTER N/A.

5.3.17.6 PRINT N/A in the “Location” block, or description found in “Building” block at top of form.

5.3.17.7 IF this procedure is being used to perform the in-use testing as directed by the ViewPoint Software Project Lead, FORWARD a copy of completed record to the Project Lead.

5.3.18 IF the Matrix RMU fails the Initial source check, PERFORM the following:

5.3.18.1 REMOVE the EPD from the Matrix RMU.

5.3.18.2 TAG the EPD with a complete Instrument Service Tag (BT-6002-880).

5.3.18.3 RETURN instrument to calibration facility for service.

5.3.18.4 REPLACE the failed EPD with a calibrated EPD.

5.3.18.5 PERFORM Section 5.4 to Log off/on EPDs.
5.3 Periodic Source Check (Cont.)

5.3.19 IF it is determined that the Instrument Service Tag was installed in error,
PERFORM the following:

5.3.19.1 CONFIRM the instrument passes all required operational checks.

5.3.19.2 OBTAIN concurrence from the First Line Manager (FLM) to place instrument back in service.

5.3.19.3 REMOVE the Instrument Service Tag.

5.3.19.4 PLACE instrument back in service.
5.4 Logging Off and On of EPDs

5.4.1 SELECT AND RIGHT-CLICK the EPD that was removed.

5.4.2 CLICK “Log Off” at the TeleTrak EDP2 drop-down window.

5.4.3 CLICK “YES” at the “Confirm Window”.

5.4.4 CONFIRM the removed EPD is no longer displayed.

5.4.5 CONFIRM replacement EPD shows up on VP SaT™ display.

5.4.6 IF status shows “Not Logged On”, RIGHT-CLICK AND SELECT “Logon” from the TeleTrak EPD2.

5.4.7 WHEN the “Logon” table is displayed, INPUT the settings as shown in Table 5.

Table 5

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wearer ID</td>
<td>Space Bar (sp)</td>
</tr>
<tr>
<td>RWP</td>
<td>Sp</td>
</tr>
<tr>
<td>Name</td>
<td>Replaced EPD Location Name</td>
</tr>
<tr>
<td>Work Order</td>
<td>Sp</td>
</tr>
<tr>
<td>Cell Phone</td>
<td>Sp</td>
</tr>
<tr>
<td>D Rate Thresh</td>
<td>* Per Projects Specific Documents</td>
</tr>
<tr>
<td>S Rate Thresh</td>
<td>99999</td>
</tr>
<tr>
<td>D Dose Thresh</td>
<td>99999</td>
</tr>
<tr>
<td>S Dose Thresh</td>
<td>99999</td>
</tr>
<tr>
<td>Lost Contact</td>
<td>60</td>
</tr>
</tbody>
</table>

5.4.8 CLICK “OK”.

5.4 Logging Off and On of EPDs (Cont.)

5.4.9 CONFIRM setpoints have been transmitted by clicking “OK” when the Information popup showing “Operation succeeded” is displayed.

5.4.9.1 IF “Operation Failed” is displayed, CLICK “OK” AND REPEAT Steps 5.2.15.1 thru 5.2.15.6 until “Operation Succeeded” is displayed.

5.4.9.2 IF nothing is displayed, REPEAT Steps 5.2.15.1 thru 5.2.15.6 until “Operation Succeeded” is displayed.

5.4.9.3 NOTIFY FLM for resolution if unit does not work.

5.4.9.4 CLICK “OK” AND CONFIRM status has changed to “TeleDose”.

5.4.9.5 REPEAT the initial or periodic source check Section 5.2 or Section 5.3.
5.5 Setting Up VP SaT™ for Operations Viewing

5.5.1 IF, while performing Section 5.5 difficulties are encountered or troubleshooting of the system is required, REFER to the VP SaT™ User Handbook.

5.5.2 CONFIRM a VP SaT™ console is setup,

OR

SETUP VP SaT™ console as following:

5.5.2.1 PLUG power cable to Laptop and a suitable A/C power receptacle AND

TURN-ON (I) the power switch above the power cord on the back of the case.

5.5.2.2 OPEN VP SaT lid (cover) AND

CONNECT remote antenna.

5.5.2.3 ATTACH USB connector to the laptop.

5.5.2.4 TURN-ON (I) the VP SaT power switch.

5.5.2.5 CHECK the laptop is powered up.

5.5.2.6 TURN-ON either the external radio or the radio power internal to VP SaT.

5.5.2.7 TURN-OFF the radio that is not being used.

5.5.3 LOG ON to Window™ XP.

5.5.4 START-UP the ViewPoint Client.

5.5.5 LOGIN using the user name and password provided.

5.5.6 CREATE Viewer's User profile for ViewPoint access.

5.5.6.1 CLICK on "Admin -> Security -> Users" and the "Administrate Users" window will open.
5.5 Setting Up VP SaT™ for Operations Viewing (Cont.)

5.5.6.2 CLICK on "New User" in the lower left hand side of the window, and the "Edit User" window will open.

a. TYPE in Viewer for "Username".
b. LEAVE blank for "Password".
c. CLICK on the toggle on the right hand-side AND SELECT the "View Only (view shared groups) "For "Role".
d. ENSURE "Login allowed" is selected:
e. ENSURE the following options are Unselected:
   - "Change Password allowed"
   - "Allow saving changes".
f. CLICK "OK".
g. CLICK "OK" for the "Administrate Users" window.

5.5.7 EDIT the HPTs User profile for ViewPoint access.

5.5.7.1 SELECT the "ADMIN" user profile from the "Administrate Users" window.

a. IF the "Administrate Users" window isn't open, REFER to Step 5.5.6.1.

5.5.7.2 CLICK "Properties" at the bottom right hand corner of the window, and the "Edit User" window will open.

a. SET "Password" to HPT (this is case sensitive)

5.5.7.3 IF password was not accepted or needs to be changed for any reason, PERFORM the following:

a. CLEAR the existing password.
b. CLOSE ViewPoint.
c. REOPEN ViewPoint.
5.5 Setting Up VP SaT™ for Operations Viewing (Cont.)

d. **SELECT** the "ADMIN" user profile from the "Administrate Users" window.

e. **CLICK** "Properties" at the bottom right hand corner of the window, and the "Edit User" window will open.

f. **SET** "Password" to HPT (this is case sensitive.)

5.5.7.4 **ENSURE** the "Role" selected is "Administrator (Configure system + users)".

5.5.7.5 **SELECT** all options. ("Login allowed", "Change password allowed", and "Allow saving changes").

5.5.7.6 **CLICK** on "OK".

5.5.7.7 **CLICK** "OK" for the "Administrate Users" window.

5.5.8 **CLICK** on "Computer Groups".

5.5.8.1 **RIGHT CLICK AND SELECT** "Create Group".

5.5.8.2 **ENTER** name of the system to be monitored. (Example C-107).

5.5.8.3 **SELECT** CNET devise from the list of "Available Devices" AND

**CLICK** ADD to list this instrument type in the "Displayed Devices" column.

5.5.8.4 **CLICK** Options, found under the group device window "Displayed Devices".

5.5.8.5 **REMOVE** the following at the "Fields Displayed" column:
- Radio Firmware
- Pack ID
- Type
- Status
- Data Source (when available).

5.5.8.6 **CLICK** "OK".
5.5 Setting Up VP SaT™ for Operations Viewing (Cont.)

5.5.8.7 CLICK on the list of "Available Devices" AND
SELECT TeleTrak EPD2.

5.5.8.8 CLICK ADD to insert this instrument type in the "Displayed Devices" column.

5.5.8.9 CLICK on TeleTrak EPD 2.

5.5.8.10 CLICK Options under the group device window "Displayed Devices".

NOTE - Holding "Ctrl" and "Shift" and selecting the top and the bottom of the list of Fields will select the entire list allowing quick removal from "Fields Displayed".

5.5.8.11 REMOVE all options AND
ADD back the following at the "Fields Displayed" column:
- Device ID
- Name
- D Rate
- D Rate Thresh
- Lost Contact
- Status
- Report Time.

5.5.8.12 USE the Arrows below the "Fields Displayed" column to align the fields to match the list above.

5.5.8.13 SELECT the "Popup Alarms" tab AND
MOVE the following list from the "Available Alarms" Column to the "Alarms that generate a Popup" Column by selecting an item and clicking "Add".
- D Rate 1 (Latched)
- D Rate 2 (Latched).

5.5.8.14 CLICK "OK" to accept the Group Device parameters.

5.5.8.15 CLICK "OK" to establish the Group.
5.5 Setting Up VP SaT™ for Operations Viewing (Cont.)

5.5.9 **ESTABLISH** graphic representation of RMU dose rate values on the VP SaT™.

5.5.9.1 **SELECT** each active TeleTrak EPD2 device in the "Measurements window".

5.5.9.2 **RIGHT CLICK AND SELECT** "Graph Device".

5.5.9.3 **CONFIRM** all active TeleTrak EPD2 devices are displayed in the Graphs tab.

5.5.9.4 **RIGHT CLICK AND SELECT** "Graph D Rate" from the dropdown menu (in the upper window).

5.5.10 **CLICK** on the Measurements Tab.

5.5.11 **ESTABLISH** Text Log representation of RMU dose rate values on the VP SaT™.

5.5.11.1 **SELECT** each active TeleTrak EPD2 devices in the "Measurements Window".

5.5.11.2 **RIGHT-CLICK AND SELECT** "Add to Text Log".

5.5.11.3 **CONFIRM** all active TeleTrak EPD2 devices are displayed in the "Text Log Tab".

5.5.12 **CLICK** on the "Measurements" Tab."
5.5 Setting Up VP SaT™ for Operations Viewing (Cont.)

5.5.13 ESTABLISH graphs representative of RMU battery status on the VP SaT™.

5.5.13.1 SELECT each active CNET Devices in the "Measurement Window".

5.5.13.2 RIGHT-CLICK AND SELECT "Graph Device".

5.5.13.3 CONFIRM all active CNET Devices are displayed in the Graphs Tab.

5.5.13.4 RIGHT-CLICK AND SELECT "Graph Battery Voltage" from the drop down menu (in the lower window).

5.5.14 CLICK on "Measurements Tab".

5.5.15 ESTABLISH Test Log representative of RMU battery status on the VP SaT™.

5.5.15.1 SELECT all active CNET Devices displayed in the "Measurements Window".

5.5.15.2 RIGHT-CLICK AND SELECT "Add to Text Log".

5.5.15.3 CONFIRM all active CNET devices are displayed in the "Text Log Tab".

5.5.16 CLICK on the "Measurements" Tab.

5.5.17 CONFIRM required EPDs (Matrix RMU) are Logged ON and communicating with the VP SaT™ console by observing Report Time changes.

5.5.17.1 IF required EPDs (Matrix RMU) are not Logged ON, REFER to Section 5.4.

5.5.18 PERFORM a source response check per Section 5.3.

5.5.19 CLOSE OUT ViewPoint.

5.5.20 OPEN ViewPoint logging into the Viewer user.

5.5.21 OPEN the Group for viewing and select the measurement window.
5.6 System Operation

5.6.1 **MONITOR** the dose rate(s) from the Matrix RMU(s) as appropriate following the guidance provided in project specific documents, technical work document(s), or RWP.

5.6.2 **IF** directed by RadCon Management change Matrix RMU alarm setpoints using Steps 5.3.4.1 through 5.3.4.10.

5.6.3 **IF** the Matrix RMU alarms, **REFER** to TFC-ESHQ-RP_ARP-C-01, “Area Radiation Monitor Alarm Response” procedure, including making the required notifications. (Once the Matrix RMU receives an alarm condition, both the audible and visual alarm will annunciate. The audible alarm will sound for 10 minutes and the strobe will flash for 45 minutes, then they will turn off to conserve battery life. The alarms at the VP SaT™ console will reflect the actual status of the area radiation conditions including alarm conditions.)

5.6.4 **WHEN** the evacuation and actions required in the alarm response procedure have been completed:

5.6.4.1 **DISCUSS** with the HP First Line Supervisor about placing the Matrix RMU that alarmed into a state that would provide indication of changing radiological conditions.

5.6.4.2 **IF** supervision/management concurs, **CHANGE** the D Dose Rate Alarm to a value approximately 5% above the current dose rate, as stated in Steps 5.3.15 thru 5.3.15.10.
5.7 Records

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

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

**OR**

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

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

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

5.7.1.3 **SUBMIT** the package for verification of completed records.

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>
<tr>
<th>Records Submittal Checklist</th>
<th>Number of pages completed</th>
<th>N/A (✔)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Form A-6004-432 Area Radiation Monitor Source Check Log</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

________________________ / ________________ / ________________

Signature Print (First and Last Name) Date

First Line Manager (or designee)