Preparation and Field Use of the ToxiRAE PRO System

Tank Farm Plant Operating Procedure

Industrial Hygiene

USQ # N/A-4

CHANGE HISTORY (LAST 5 REV-MODS)

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<td>A-1</td>
<td>10/09/2018</td>
<td>Industrial Hygiene Request</td>
<td>Modified Step 5.2.3.1 by inserting the word “not” for more clarity while performing task.</td>
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This is a new revision. The First Time Use process as defined in TFC-OPS-OPER-C-13 can be used during the initial performance of this revision.

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1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this procedure is to ensure the proper operation and use of the ToxiRAE PRO System including the ToxiRAE monitor (model PGM-1860), AutoRAE 2 Charging Cradle and AutoRAE Controller in support of field monitoring performed in accordance with TF-OPS-IHT-007 and applicable industrial hygiene sampling plans.

1.2 Scope

The scope includes basic operation: setup and configuration of AutoRAE controller, and charging, zeroing, span test, bump test, User Mode selection, data logging, and downloading sampling information.
2.0 INFORMATION

2.1 General Information
The ToxiRAE PRO monitor should be operated within the following parameters:

- Concentration range: NH₃ - 0 to 100 ppm, resolution 1 ppm
- Temperature range: −4 to +131°F (-20 to +55°C)
- Operating time: > 30 hours (normal operation)
- Charge time: < 4 hours (in charging cradle)
- Response time (T90): NH₃ - 60 sec
- Accuracy: 10%
- Sampling type: Diffusion
- Calibration time (sec): NH₃ – 150 sec (pre-exposure time for 1-min Calibration Time – 90 sec)
- Datalogging: Continuous, with 3-month capacity (one-minute intervals)
- Wireless Range (typical): 300 ft
- Relative humidity: 0 to 95% (non-condensing)
- Display—Graphical LCD display with white LED backlighting (activated when monitor is in alarm or with a button press).

2.2 Terms and Definitions
Bump Test-Another name for a “Function Check”, specific to this procedure
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Work under this procedure falls within the General Hazards Analysis (GHA).

3.2 Radiation and Contamination Control

3.2.1 Planned work in radiological areas must be approved by Radiological Control personnel per the Radiological Risk Screening procedure TFC-ESHQ-RP-RWP-C-01.

3.2.2 When performed without a formal work package or approved procedure (i.e., Level 3 or 4 work), this procedure is limited to radiological areas and work activities permitted by a low risk Radiological Work Permit (RWP).

3.2.3 Before conducting sampling or monitoring, contact the responsible Radiological Control personnel for the facility or area to determine any specific survey or monitoring requirements.
   - Pre, during, and post contamination survey requirements.
   - Any applicable RSP’s for your specific equipment or task.
   - Alternative survey or monitoring needs to support the radiological release survey process.
4.0 PREREQUISITES

4.1 Special Tools, Equipment and Supplies

The following supplies may be needed to perform this procedure:
- AutoRAE Cradles
- AutoRAE Controller
- Docking Station.

4.2 Performance Documents

The following documents may be needed to perform this procedure:
5.0 PROCEDURE

5.1 Operation of ToxiRAE Pro System

NOTE - The ToxiRAE Pro should be turned off before placing it in the charging cradle to fully charge. Contacts on the bottom of the unit must be inspected and cleaned with a soft cloth (no solvents or cleaners), if necessary, in order to make good contact with charging pins in cradle.

- Activities can be performed independently or in any logical order per Industrial Hygienist direction.

Turning off the ToxiRAE Pro

5.1.1 PRESS and HOLD [MODE]. In 2 seconds, a 5-second countdown to shutoff begins, accompanied by one buzzer beep per second.

5.1.2 HOLD the key for the entire shutoff process.

NOTE - If the [MODE] key is released during the countdown, the shutoff operation is canceled and the ToxiRAE Pro continues normal operation.

5.1.3 RELEASE the [MODE] key when “Unit Off,” appears.

Turning the System On

NOTE - The display and power LED glow, and the LEDs on attached cradles light up. The AutoRAE 2’s internal pump and the valves in the system are tested. If self-checkout is successful, the system is ready to use. The display provides a list of the AutoRAE 2 Cradles, any instruments in them and the names of the instruments.

5.1.4 VERIFY calibration gases match the configurations created in ProRAE Studio II and are transferred to the AutoRAE 2 Controller.

5.1.5 ENSURE the gas cylinders have sufficient gas to perform span and bump tests properly.

5.1.6 ENSURE the sensor cover/top cap on the instrument is not dirty or clogged.

5.1.7 ENSURE the ToxiRAE instrument is turned off.

5.1.8 PLACE the instrument in the cradle face-down AND

ENSURE it is aligned correctly with the contacts on the AutoRAE 2 cradle charging port.
5.1 Operation of ToxiRAE Pro System (Cont.)

5.1.9 PRESS in on the capture mechanism to lock the instrument in place.

**Automatic Warm-up Before Pre-Operation Bump Testing or Span Testing**

NOTE - Using the AutoRAE 2 Controller for all Bump Testing and Calibrating is the only approved method within this procedure.

- The instrument begins charging and is automatically warmed up and turned on when it is placed in the cradle and locked with the capture mechanism.

5.1.10 VERIFY that Warm-up mode has commenced.

**Bump Testing AutoRAE Controller**

5.1.11 ENTER Bump Test by pressing [Y/+] twice (“Function” and then “Select”) from the main screen.

NOTE - Any cradle that does not have an instrument in it is shown with a gray checkbox. It is not possible to check/uncheck this box.

5.1.12 SELECT all instruments in cradles AND

PRESS [Y/+] to bump test.

5.1.13 PRESS [MODE] for “Done.”

NOTE - If [Y/+] was not pressed to start the process, a countdown begins. When the countdown reaches zero, the instruments are bump tested.

5.1.14 PRESS [Y/+] to start the bump test.

5.1.15 PRESS [N/-] to scroll down the list to select an instrument for bump testing.

5.1.16 PRESS [Y/+] to toggle the selection between unchecked and checked.

5.1.17 PRESS [MODE] for “Done.”
5.1 Operation of ToxiRAE Pro System (Cont.)

5.1.18 PRESS [N/-] to abort a bump test. A prompt will appear asking if the bump test should be aborted.

5.1.19 PRESS [Y+] for “Yes” and [N/-] for “No.”

Action after Bump Failed

5.1.20 SELECT the action performed by the AutoRAE 2 if a bump test fails from one of the following:
   - Calibration if Bump Test Fail
   - Bump Test Only.

5.1.21 PRESS [N/-] to advance to the next option.

5.1.22 PRESS [Y+] to select the highlighted option
   OR
   PRESS [MODE] to go back.

5.1.23 PRESS [N/-] to advance to the next option.

5.1.24 PRESS [Y+] to save the change
   OR
   PRESS [N/-] to abort.

5.1.25 IF first calibration fails, POWER the ToxiRAE off AND
   POWER on the ToxiRAE to attempt a second calibration.

5.1.26 IF unsuccessful, RETURN ToxiRAE to equipment custodian with a completed green tag “IH Instrument Service Tag” (BT-6004-019) indicating it “Calibration Failure.”
5.1 Operation of ToxiRAE Pro System (Cont.)

Removing a ToxiRAE Unit from a Charging Cradle

5.1.27 PRESS the button on the AutoRAE to release the capture mechanism AND LIFT the instrument from the cradle to remove the instrument from its cradle.

NOTE - Power should be on when instrument is removed from the cradle. The following steps are to be taken if the unit is off.

5.1.28 PRESS AND HOLD [MODE] button for 3 seconds. The unit will start and test the following functions:

- Buzzer (alarm will be very loud)
- Vibration alarm
- LEDs
- Battery.

5.1.29 CONFIRM the “Self-Test” is complete from the following prompts:

- Display shows the model number, sensors installed, etc.
- Ensure the unit is in the desired monitoring mode.

5.1.30 IF the unit is on, PRESS [MODE] until “Exit” is highlighted AND PRESS [Y/+] button to advance to the next screen.

5.1.31 PRESS [Y/+] button again to return to Normal mode.

5.1.32 CONFIRM the battery pack shows a full battery icon in upper right hand corner.

5.1.33 IF battery needs charging, PERFORM the following using the charging cradle charger:

5.1.33.1 ENSURE charging cradle has power.

5.1.33.2 POWER DOWN the ToxiRAE unit.

5.1.33.3 PLACE face down in charging cradle AND LOCK into place.

5.1.33.4 CONFIRM the display indicates the unit is charging by the LEDs on cradle glowing red.
5.1 Operation of ToxiRAE Pro System (Cont.)

NOTE - WHEN fully charged, LEDs on charging cradle will glow green.

5.1.33.5 GO TO Normal Basic Mode section.

NOTE - A “floppy disc” icon will appear in the upper right-hand corner of the screen when data logging is enabled.

5.1.34 ENSURE the floppy disc icon is visible which indicates the datalog function is operational.

5.2 Perform Post Monitoring Activities

5.2.1 TURN OFF power to ToxiRAE unit AND PLACE in charging cradle.

5.2.2 PERFORM post function check ([Bump test] refer to section 5.1

NOTE - Cleared data cannot be recovered once it is deleted.

5.2.3 VERIFY if datalog information is needed.

5.2.3.1 IF datalog information is not needed, ENTER Datalog Subscreen in Programming Mode AND SELECT “Clear Datalog.”

5.3 Records

No records are generated during the performance of this procedure.