1.0 PURPOSE

1.1 The purpose of this procedure is to ensure correct use and to establish preventative maintenance guidelines for all gas detection equipment used at the Michigan Refining Division (MRD).

2.0 SCOPE

2.1 This procedure applies to all MRD employees and departments that own or may use portable gas detection equipment. This procedure also applies to all contract personnel within MRD facilities that own or may use portable gas detection equipment. This procedure establishes calibration and preventative maintenance guidelines for all portable gas detection equipment used on MRD property. This procedure defines the general requirements for training, the use, and maintenance of personal hydrogen sulfide (H2S) monitors and personal sulfur dioxide (SO2) monitors which will be collectively termed as "Personal Alarm Monitors" or "Personal Monitors". This procedure establishes guidelines for the use and maintenance of ISC MX6 iBrid® monitors.

3.0 GUIDELINE –

3.1 Personal Alarm Monitor Guidelines

3.2 Each of the following departments and work groups must have access to and wear an H_2S monitor that meets the provisions defined in Section 3.6 of this procedure:

3.2.1 Each individual member of an MRD department who may enter into an area defined in Section 3.4.

3.2.2 Each individual contractor who intends to enter or perform work in areas listed in Section 3.4

3.2.3 Each visitor entering into the refinery with the intent to enter the areas listed in Section 3.4.

3.2.4 Truck drivers and delivery personnel intending to exit their vehicle must also meet this requirement when entering areas listed in Section 3.4 of this procedure.

3.2.5 The Operations department is authorized to loan a monitor to a driver at the permitting process. Refer to Section 3.3.18 for requirements in doing so.

3.2.6 MRD employees defined in Section 3.2 of this document are required to use the personal monitors stocked by safety. No deviations will be accepted. Refer to Attachment A for a listing of stocked items related to and including Personal Monitors.

3.3 Contracting companies:

3.3.1 Are responsible for supplying personal monitors to their own personnel. A personal alarm monitor is considered life-safety personal protective equipment (PPE) and cannot be borrowed from MRD without a signed liability waiver.

3.3.1.1 Must supply enough monitors for every person on their crew working in areas of Section 3.4 before the first day of work commences. An exception to this rule is any truck drivers. Truck drivers can utilize loaner monitors from Operations as defined in Section 3.3.1.8.

3.3.1.2 Cannot obtain personal monitors from MRD. They also cannot borrow monitors from MRD personnel unless special circumstances exist and the requirements in Section 3.3.1.8 can be met.

3.3.1.3 If a contracting company purchases or has previously purchased personal monitors that deviate from the standard monitor:

NOTE: Refer to Attachment A for information on ordering personal monitors.

3.3.1.3.1 The contracting company must ensure that every monitor it purchases for use on MRD property meets the criteria for monitors listed in Section 3.5 of this document.

3.3.1.3.2 The contracting company must supply their own equal and compatible means of bump testing the non-standard H_2S monitors and perform the requirements listed in Section 3.8 through Section 3.9.

3.3.1.3.3 If the monitors are able to be fully calibrated, the company's written program for monthly calibrations is subject to random audits by the Safety Department.

3.3.1.3.4 Copies of either monthly bump or calibration logs must be maintained by the contractor company for recordkeeping purposes.

3.3.1.3.5 The contracting company must examine all pre-existing personal H_2S monitors currently on-site to determine whether they meet the criteria listed in Section 4.6 of this document.

3.3.1.4 A monitor that does not meet the criteria must be replaced by one that does immediately.

3.3.1.5 Incoming visitors may obtain loaner personal H2S monitors from Security or their Marathon contact. Section 3.3.2 of this document states requirements for obtaining a loaner H_2S monitor.

3.3.1.6 Visitors needing to obtain loaner SO_2 monitors can borrow one from Complex 2 control room. Section 3.3.2 of this document states requirements for obtaining a loaner SO_2 monitor.

3.3.1.7 Similarly, each of the above work groups must have access to and wear an SO_2 monitor that meets requirements found in Section 3.5 of this procedure when entering into an area defined in Section 3.4 of this procedure.

3.3.1.8 Visitors without an MRD contractor coordinator can obtain a loaner H_2S monitor from a designated pool maintained by Security. Other visitors must obtain loaner H_2S monitors from their MRD coordinator.

3.3.2 Requirements for Security-operated loaner pools:

3.3.2.1 The Personal Monitor Sign Out Form and any other documentation must be completely filled out before a monitor can be loaned out.

3.3.2.2 The monitor must be returned to the pool before leaving company property at the end of the working day. In cases of multiple day visits, monitors can be reassigned before the visit recommences.

3.3.2.3 The loaner monitor must be fully functional, currently self-tested, and up to date on its bump test before being loaned out for use.

3.3.2.4 Others can obtain H_2S monitors only under special circumstances. This can be determined by the Safety Department.

3.3.3 Loaner SO_2 monitors are only available in Complex 2 & 6 Control Room. All MRD departments needing to create a loaner pool of either SO_2 or H_2S personal monitors for visitors or contractors must ensure that:

3.3.3.1 A liability waiver is completed and signed before a monitor can be loaned.

3.3.3.2 The department maintains accountability for all monitors of the loaner pool.

3.3.3.3 The loaner monitor is fully functional, currently self-tested, and bump tested within 1 month of the date listed on the reminder label before being loaned out for use.

3.4 Areas Where Monitors Must be Worn

3.4.1 H_2S monitors must be worn at all times while:

3.4.1.1 Inside process unit battery limits

3.4.1.2 Inside tank dike walls

3.4.1.3 Sulfur and other chemical loading or unloading at docks and loading racks

3.4.1.4 Within the laboratory test rooms while products are being tested

3.4.1.5 During any other activities in areas where there is known or suspected H_2S

3.4.2 SO_2 monitors are required:

3.4.2.1 SRU Incinerator Building if multi-gas monitor does not contain an SO2 sensor

3.4.2.2 Welding/cutting on acid gas trains

3.4.2.3 In other areas with suspected sulfur dioxide exposure.

3.5 Criteria for Monitors

3.5.1 All personal alarm monitors must meet the following criteria:

3.5.1.1 Must have a functioning audible, visible alarm, and vibration alarm.

3.5.1.2 Must have a means of communicating monitor failure.

3.5.1.3 Must have an acceptable means of attachment such as an alligator clip, lanyard (necklace) connection, or hard hat clip.

3.5.1.4 Must display the concentration of gas in parts per million (ppm) upon alarming.

3.5.1.5 Must have a means of displaying the life remaining on the monitor if disposable.

3.5.1.6 LCD must be clear and readable.

3.5.1.7 Sensor filter must be free of dirt and debris.

3.5.1.8 Personal alarm monitors must have two alarm set points as indicated:

3.5.1.8.1 Personal H_2S monitors must have a low alarm set at a concentration of 10 ppm of H_2S and the high alarm must be set to alarm at 20 ppm of H_2S.

3.5.1.8.2 Personal SO_2 monitors must have a low alarm set at a concentration of 2 ppm of SO_2 and the high alarm must be set to alarm at 4 ppm of SO_2.

3.5.2 Tango Personal H2S/SO2 Monitors

3.5.2.1 Monitors will be set to always on

3.5.2.2 Monitors will be set in text mode with “H2S” in the display for Marathon monitors.

3.5.2.3 Monitors have a replaceable Li-Ion battery. There is no end-of-service life.

3.5.2.4 The monitor has a latching alarm. The monitor will keep alarming until the user presses a button acknowledging the alarm. After an alarm has occurred the alarm can be reset by pressing and holding the arrow button on the right for a few seconds.

3.5.2.5 The monitor has a bump test overdue warning. After 30 days, A calendar with the number “31”, a bottle with a “B” in it, and an “!” will show below the H2S display. The monitor will also beep every minute until the monitor is bump tested.

3.5.2.6 Please go to the Personal/Multi-Gas Monitors and Equipment tab under the PPE website on the Safety Webpage for replacement filters, alligator and hard hat clips, and replacement calibration gas.

3.6 How to Wear Monitors

3.6.1 Personal monitors must be worn on the head or body as close to one foot of the breathing zone as possible. Acceptable locations include but are not limited to:

3.6.1.1 Clipped to the side edge of a hardhat near the face

3.6.1.2 Clipped to the outside of a breast pocket

3.6.1.3 Clipped facing outward to a lapel.

3.6.2 Monitors must be worn so that the sensor is unobstructed, clear, and exposed to the atmosphere. If worn on clothing, it must be worn on the outer layer of clothing, coats, suits, or raingear.

3.6.3 The monitor must be worn so that the sensor faces outward, or away from the body.

3.7 If a Monitor Alarms While In Use

3.7.1 All personnel in the immediate area must evacuate to a safe distance from the hazard.

3.7.2 Notify immediate foreman, supervisor, or MPC Field Operator that the monitor alarmed and whether all personnel have been removed from the area. Also describe the work that was being performed, the location where it alarmed, and any other details that can be remembered at the time.

3.7.3 The alarm and surrounding information must be entered into Intelex.

3.7.4 For re-entry after an alarm, the area atmospheric conditions must be verified by MPC Operations personnel and approved for re-entry before anyone can return.

3.7.5 To verify a hazardous condition, MPC area personnel should identify the source utilizing the proper personal protective equipment (PPE) as outlined in the Personal Protection Equipment Reference Guide located in section 6.0 of the General Safety Rules procedure.

3.8 Care of Monitors

3.8.1 Personal monitors must be tested, used, and maintained in accordance with the manufacturer's directions.

3.8.2 When maintaining non-standard monitors, refer to the manufacturer's instructions and Section 3.3.1.3 of this document for guidance.

3.8.3 Monitor "testing" must include a minimum monthly bump test.

3.8.4 A bump test must be performed prior to use on a monthly (minimum) basis. Bump testing is encouraged on a daily basis. Section 3.9 explains more about bump testing.

3.8.5 If a personal monitor is dropped, possibly exposed to a chemical, shows signs of malfunction,or has been overanged, it must be bump tested again to ensure it is fully functional.

3.9 Bump Testing Personal Alarm Monitors

3.9.1 Personal Alarm Monitors must be bump tested at a minimum of once a month. Weekly bump testing is recommended.

3.9.2 A reminder label must be used to indicate the due date of the next bump test (See Attachment A for warehouse stock numbers).

3.9.3 The bump station's test gas must contain a set concentration of the gas intended for the monitor.

3.9.4 Hydrogen sulfide test gas must have a concentration of H_2S that is greater than 10 ppm. The warehouse stocks appropriate test gas with a concentration of 25 ppm (See Attachment A for warehouse stock numbers).

3.9.5 Sulfur dioxide test gas must have a concentration of SO_2 that is greater than 2 ppm. The warehouse stocks appropriate test gas with a concentration of 5 ppm (See Attachment A for warehouse stock numbers).

3.9.6 The test gas must not be used, stored, or installed in conditions where the temperature may exceed 125 degrees Fahrenheit or fall below 15 degrees Fahrenheit.

3.9.7 Each bump test station must be assigned to an area to take responsibility for performing monthly inspections using the questions found in RSW-SAF-EE03-DT. Area is also responsible for maintenance and reordering supplies. Attachment A may be of use in maintaining these stations.

3.10 Disposal of Monitors and Test Gas Cylinders

NOTE: Personal monitors must not be disposed of in the normal waste stream.

3.10.1 Personal monitors are obtained through the LENEL office in the NES building or at Kristen Preston's office Room D117 in the Administration Building. Employees will bring the failed monitor with them to exchange for a new monitor. The H2S Personal Air Monitor Assignment/Exchange Form (Form1 in this procedure) will be filled out with the failed monitor and turned into Security at the NES LENEL Office. The H2S Monitor Assignment/Exchange Forms will be filed in the NES LENEL Office. The monitor should be exchanged for replacement when any of the following occur:

3.10.1.1 Monitor fails bump and calibration after filter replacement or multiple attempts

3.10.1.2 Battery Failure

3.10.1.3 Physical damage (i.e display cannot be read, etc.)

3.10.1.4 Lost Monitor

3.10.2 Monitors from other sources:

3.10.2.1 Most monitors have a warranty. MPC recommends checking with the monitor manufacturer to determine if the warranty applies.

3.11 Training of Personnel on Personal Alarm Monitors

3.11.1 All MRD personnel and contractors meeting requirements listed in Section 3.4 must be trained on the requirements listed in this document.

3.11.2 Personnel (see Section 3.2) must be initially trained on the requirements of this procedure and training must be refreshed thereafter as needed and determined by the Training and Safety Departments.

3.11.3 Training beyond Computer Based Training modules for MRD personnel must be documented and distributed to the Training Department for record keeping.

3.11.4 Training for contractors must be documented and retained by the contracting company. These documents may be subject to audits.

3.11.5 Visitors meeting requirements listed in Section 3.2 and Section 3.4 must be trained on the content of this document before entering the refinery premises. The Advanced Safety Orientation contains the required materials.

3.12 **Multi- Gas Detectors for Marathon Personnel**

3.13 All portable multi- gas detectors must be uniquely labeled or marked to identify one detector from another. The owning department or contractor name must also be indicated (i.e. Cx1- #3 or ABC Company #1). This unique label will be recorded and tracked through the ISC iNet System along with the serial number, and owner of the instrument.

3.14 All detectors should be kept indoors when not in use.

3.15 Any person expected to operate a portable gas detector must receive user training for that model of detector prior to using it.

3.16 The owning department or contractor is responsible for ensuring that the detectors are properly maintained and calibrated as specified in Sections 3.19 and 3.21 of this document.

3.17 The following sections directly apply to Marathon Petroleum Company personnel:

3.17.1 Each owning department must have access to and maintain an adequate number of detectors for use in the event that their detectors need maintenance.

3.17.1.1 Operations (Complexes 1 through 6) must purchase and maintain a minimum of four detectors per complex.

3.17.1.2 Product Control Operators (LPG, Melvindale, Black Oil, and Marine) must purchase and maintain a minimum of five detectors, one per operator and one spare detector. If additional detectors are needed, they must be borrowed from other components of the Product Control group.

3.17.1.3 Maintenance (Areas 1 through 6) must purchase and maintain a minimum of two detectors per area. Inspectors and other departmental personnel must be permitted to use these detectors as needed.

3.17.1.4 Members of the owning department or other approved party may perform maintenance on a portable gas detector only if they have received the proper documented training to do so.

3.17.1.5 The Foreman or Supervisor of the owning department must act as the detector liaison between the party performing the calibration and the owning department itself. An alternate +person must be identified to act in the place of the Foreman/Supervisor if he/she is not able to perform these duties.

3.17.1.6 The Foreman/Supervisor is responsible for coordinating pickups or deliveries of detectors through the servicing party, tracking locations of detectors needing servicing, and maintaining the number of detectors within his or her group as required in Section 4.1.6.1 and any other related equipment found in Attachment B.

3.17.1.7 Each gas detector's owning department must be responsible for allocating the resources to replace equipment and accessories where needed. Failed single gas and multi-gas monitors will be turned into the safety department and replacements will be issued.

3.17.1.8 ISC Docking Station- calibration gas, regulator, and appropriate tubing must be located in an easily accessible area that has a power supply (plug) and Ethernet connection within each complex, maintenance area, or other location where detectors are used.

3.17.1.9 Detectors will be monitored and tracked through the ISC iNet system.

3.18 **Multi-Gas Detectors-General Operating Guidelines**

3.18.1 Contractors must maintain and provide their own detectors for use while performing jobs that require them (i.e. confined space entries) at the Detroit Refinery. Detroit does not provide detectors for contractors' use except in unusual cases.

3.18.2 Monitors must be inspected before each use

3.18.3 Monitors must have an internal pump or battery operated external pump attachment when monitoring confined spaces. NO hand aspirated sample bulbs. Pumps are not required if the monitor is worn on the person

3.18.4 Monitors must have a Pump Block or Flow Fault check before each use

3.18.5 Monitors must be bump tested according to the manufacturer's recommendations

3.18.6 Monitors must be calibrated at least monthly or more often depending on duration of use, monitoring environment and manufacturer's requirements

3.18.7 Monitors must have the following alarm set points: LEL = 10%, O2 = 19.5% low and 23.5% high. CO = 25 ppm, H2S = 10 ppm, and SO2(if applicable) = 2 ppm

3.18.8 Bump Tests and calibrations must be documented for auditing purposes

3.19 Operating Guidelines for MX6 iBrid

3.19.1 The following must be performed before the first use of the detector for every shift:

3.19.1.1 Check battery power. The detector must be adequately charged. The detector should be turned off and charged when possible to save its power when not in use. The detector may not operate properly if not adequately charged.

3.19.1.2 With the monitor turned on perform a pump block test. Block the inlet of the pump until the detector alarms. Clear the alarm to continue. Repeat this process with the sample line and probe attached. Detectors that fail a pump block test must NOT be used. They must be tagged “REPAIR AND RETURN.” Explain in the description that the detector failed its pump block test and set aside for repairs before they can be used again.

3.19.1.3 Perform a bump test as defined in Section 3.4.2

3.19.1.4 Check the date on the cylinder of the calibration gas to ensure its within the expiration date. Also ensure that gas cylinder has adequate pressure.

3.19.2 All instruments must be used and maintained in accordance with the manufacturer’s instructions.

3.19.3 Portable gas detection instruments used by MPC and contract personnel must be calibrated on at least a monthly basis.

3.19.4 Personnel must receive training specific to calibration and maintenance of the on-site gas detectors if maintenance of detectors is a required job function.

3.19.5 The Safety Department is responsible for coordinating the use of a qualified servicer to complete the monthly calibrations for all MPC portable gas detection instruments. The qualified servicer will complete forms RSW-SAF-EE36-FORM01-DT, RSW-SAF-EE36-FORM02-DT, and RSW-SAF-EE36-FORM03-DT (see “References” section for instructions on how to complete the form). Upon completion of the inspections, the checklists are turned into and maintained by the Safety Department per the records retention policy.

3.19.6 The Safety Department must arrange for all Detroit Refinery-owned detectors to be maintained as necessary by a qualified servicer. Detectors needing servicing must be tagged “REPAIR AND RETURN” and a written, clear reason for the needed servicing on the tag along with the equipment number of the detector and the owner of the instrument

3.19.7 Detectors that fail calibration must not be used until they pass calibration.

3.19.8 The qualified servicer must maintain Marathon detector logs. Contractors must maintain their own logs of all calibrations and repairs. The logs and any contractor-owned detectors are subject to audits by the Safety Department. An example log is included in Attachment D of this procedure.

3.19.9 Multi-gas Detectors will have a screen on power-up that shows the days since the last calibration for each sensor. Any sensor that is passed 30 days since the last calibration will be marked as “Sensor Calibration Overdue” and prevents the worker from using the instrument. The monitor must be placed in the docking station to calibrate the instrument for use.

3.20 MX6 iBrid Bump Test Instructions

3.20.1 Bump checks for the instrument should be done before each shift.

3.20.2 Place the monitor on or off in the docking station. If the monitor is left in the docking station after tests have been completed, the station will charge the monitor.

3.20.3 The docking station will begin to fresh air zero and bump check the instrument to 50% of the

calibration gas concentration. The docking station will have a :Green" LED if it has passed all diagnostics and the bump check

3.20.4 If the monitor fails the bump check, the docking station will automatically calibrate the MX6 iBrid. The station will display a "Green" LED if it passes calibration and the monitor is ready to use

3.20.5 If the monitor fails both the bump check and calibration, the "RED" LED will light on the station and the monitor should be tagged "Out of Service" ISC will send a replacement monitor

3.20.6 All detectors must have a "BUMP CHECK RECORD" tag attached. For detectors passing the bump check, record the date, shift, and initial the bump check tag on the detector to show that it is acceptable to use for that shift. The tag must be recorded with new bump check results every shift that the detector is used

3.21 MX6 iBrid Manual Bump Test Instructions

3.21.1 **This section only applies if the docking stations are unavailable**

3.21.2 Remove the calibration gas hoses and communication cables from the back of the docking station and attach black hose to connection

3.21.3 Turn monitor on and perform a fresh air zero by pressing the "Power" button when the screen reads "Zero All Sensors?"

3.21.4 Perform a "Pump Fault" check by blocking the inlet with your finger and wait a few moments for the pump to restart.

3.21.5 Attach the black hose to the inlet of the monitor for each calibration gas cylinder for that location to bump test all sensors.

3.21.6 Sensor reading should be at least **50%** of the concentration listed on the cylinder to pass a bump test.(For Example: 100 ppm CO in cylinder= at least 50 ppm reading on monitor)

3.21.7 Detach hose and let readings recover to normal atmospheric readings before use.

3.21.8 Update bump check record tag

3.22 MX6 iBrid Calibration Instructions

3.22.1 Ensure the sample tubing is clear in color and that any filters on the detector are not visibly dirty or wet. If maintenance is needed beyond the level of training, tag the detector "REPAIR AND RETURN." Explain what parts need replacement and give to the Foreman/Supervisor to track for servicing.

3.22.2 Calibration is required every month according to Michigan Refining Division's Portable Gas Detection Equipment Calibration Procedure. It is not a required daily procedure.

3.22.3 To enter calibration mode, press MX6's"power" button till you see "View. . Use the "right arrow to scroll to "sensor" and push "power" button and go to "zero all" and press power for "ok".

3.22.4 The instrument will perform a fresh air zero on all sensors and will say "passed" in green when all sensors complete the zero process.

NOTE: Anytime Fresh Air Setup is performed, make sure the atmosphere is well-ventilated and as free of contaminants as possible.

3.22.5 All calibration gas must be within the expiration limits listed on the label of the gas cylinder.

NOTE: Calibration gas used should consist of a mixture of known concentrations of combustibles, oxygen, carbon monoxide, and hydrogen sulfide gases. SO2 gas if necessary Check the label of the calibration gas to make sure it is not expired. Do not use the calibration gas if it is expired.

3.22.6 Expired and empty calibration gas cylinders must be collected in designated containers specified by the Environmental Department and collected by a third party vendor for disposal and/or recycling.

3.23 Dilution Tube Use for MX6

3.23.1 The Safety Department will use this accessory for monitoring LEL including hydrogen in an oxygen deficient atmosphere (<10%). The RKI Eagle Monitor must not be used to measure hydrogen regardless of the atmosphere.

3.23.2 Arrow on dilution tube must point towards the instrument

3.23.3 The O2 concentration where the dilution tube is drawing in air must be between 20.0% and 23.5%

3.23.4 NOT use the dilution tube if the O2 concentration is >10% O2 inside the equipment.

3.23.5 The equipment being sampled must be at atmospheric pressure. Positive pressure will produce erroneous high readings and negative pressure will produce erroneous low readings

3.23.6 The maximum length of the sample tube is 10 feet. No external filter will be used

3.23.7 Verify dilution tube opening is not blocked and is free of oil or any other debris.

3.23.8 The dilution tube is a 1:1 fitting. Gas concentrations for all sensors(except O2) must be multiplied by 2 to get the correct reading.

3.23.9 Sample the equipment for three minutes.

3.23.10 Read the Industrial Scientific Dilution tube Air Sampling Instruction guide before using the dilution tube

3.24 MX4 use and response when using non-intrinsically safe equipment (e.g insulin pump, external Pacemaker, etc.)

3.23.0 All personnel wearing these type of devices must wear a gas monitor that detects for LEL

3.24.1 Must detect for at least LEL and H2S

3.24.2 Must be bump tested daily or before each use

3.24.3 Must be calibrated at least monthly

3.24.4 Respond to LEL alarm per ERP-021 Fixed Air Monitoring Alarms procedure. Person wearing 4 gas monitor cannot respond to hazardous area

3.24.5 Respond to H2S alarm per SAF-071 H2S Exposure Control Plan.

3.25 Draeger Pumps

3.25.1 Each Complex will assure that Draeger pumps are checked for leaks and suction capacity before each measurement.

3.25.2 Leaks - Insert an unopened Draeger tube and squeeze the pump completely. After releasing, the position of the pump body should not change within one minute. Remove the tube.

3.25.3 Suction Capacity - Squeeze the pump completely. After releasing, the pump must open instantly.

4.0 DEFINITIONS –

4.1 Owning Department- the Detroit Refinery department or organization for which the portable gas detector(s) were purchased and used.

4.2 Qualified Servicer – A person or company designated by the Safety Department who has received documented training in calibrating and maintaining on-site portable gas detectors.

4.3 Bump check- A procedure performed before each shift of applying a known concentration of calibration gas containing a mixture of at least combustible, oxygen, carbon monoxide, and hydrogen sulfide gases to ensure that the instrument's sensors are accurately reading the gas concentrations.

4.4 Calibration- the multi-gas detector's way of automatically setting its gas sensors to the required concentration values of the calibration gas. The Detroit Refinery requires this to be completed at least every month on the MX6 and when necessary on the GasBadge Plus.

4.5 Fresh Air Setup- a system that the MX6 iBrid goes through when first powered on that involves the zeroing out of sensor's concentration levels to the fresh, uncontaminated air it intakes during that period of time.

4.6 Owner- members of the Owning Departments who have purchased and have possession of the instrument in order to monitor specific airborne contaminants.

4.7 Portable Gas Detector – also referred to as four-gas or atmospheric monitors, instruments, gas checkers, combustible gas indicators, etc. They include but are not limited to the ISC MX6 iBrid, RAE Systems UltraRAE, AreaRAE, MultiRae Plus and the Draeger tubes and pump.

4.8 PPE- Personal Protective Equipment

4.9 PPM- parts per million.

4.10 Pump Test- process of blocking the running pump on an MX6 iBrid by placing a finger over the pump to starve it from air. The pump test passes if the instrument goes into audible and visual alarm. The instrument is not to be used if it fails its pump test.

4.11 Regulator- a hardware device that when screwed into its matching calibration gas bottle permits or prevents gas to freely flow from the bottle by turning it on or off. The regulator may be a demand flow style or fixed flow regulator at .5 liters per minute.

4.12 Bump Test – Exposing the personal monitor to a concentration of hydrogen sulfide test gas that exceeds the monitor's alarm level to test the sensor's response to the gas.

4.13 Defective – A monitor that: fails a bump test 3 or more consecutive times, will not perform daily self-tests, cannot be activated, has more than 1 day of life remaining yet continuously alarms while in an atmosphere that is clear of H_2S, or has other deficiencies other than the life remaining has expired and the monitor has deactivated itself.

4.14 Standard Monitors –One model of H2Spersonal alarm monitor in use by Marathon employees within Michigan Refining Division: the Industrial Scientific Tango TX1.

4.15 Visitor – A person (excluding truck drivers) entering the premises for NOT MORE THAN 10 working days per year who also requires an escort from an existing MRD employee or contractor while on company property. Any person entering the premises for longer than 10 working days will be considered a contractor for the purposes of this procedure unless special circumstances apply.

5.0 REFERENCES –

- RSW-SAF-EE36-00-DT Gas Detector Instruction for Completing the Emergency Equipment ITPM Checklist Form

6.0 ATTACHMENTS – Form1: H2S Personal Air Monitor Assignment/Exchange Form

7.0 REVISION HISTORY

Revision #	Description of change	Written by	Checked by	Effective date
15	Corrected footer dates	F. Ebbert	J. Rabideau	10/29/15
16	Added Section 3.24 on MX4 Personal Multi Gas Monitor	J. Taggart	J. Rabideau	8/26/16
17	Scheduled review. Minor additions and deletions	J. Taggart	J. Rabideau	2/28/17
18	Added Section 3.23 Dilution Tube Use for MX6	J. Taggart	J. Rabideau	12/5/17
19	Replaced references to KMS with Intellex	J. Taggart	J. Rabideau	03/14/17

ATTACHMENT A

Stock Numbers

For Industrial Scientific Monitor Equipment

Monitors

Tango TX1 external dust/water filter:
FILTER-MISC – 57-250-003

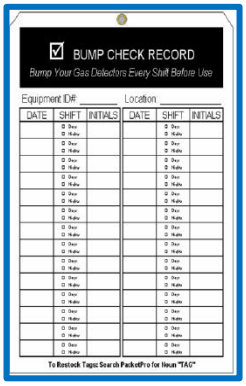
Tango TX1 Single Gas Monitor
Personal monitor senses only one gas. Your choice of hydrogen sulfide (H_2S) or sulfur dioxide (SO_2).
NOT STOCKED
**Contact Safety to order. NOTE: Each monitor is assigned to only one person.*

MX6 internal dust/water filter:
FILTER-MISC – 33-991-274

MX6 Multi-Gas Monitor
Measures oxygen (O_2), lower explosive limit (LEL), carbon monoxide (CO), and Hydrogen Sulfide (H_2S). Monitors can be set up to measure sulfur dioxide (SO_2) upon request.
NOT STOCKED
**Contact Safety to order*

Tags

Tested Stickers:
NOUN: LABEL
Stock #: 90-500-123



Bump Check Record Tag:
NOUN: TAG
Stock #: 72-213-012

Repairable Item Tag:
NOUN: TAG
Stock #: 72-213-002

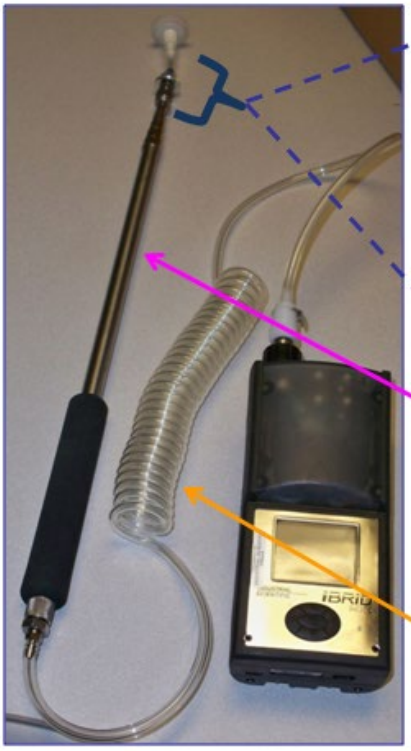
Tie Wraps (not pictured):
100 per package
NOUN: TY-RAP
Stock #: 55-684-003

ATTACHMENT B

Stock Numbers

For Industrial Scientific Monitor Equipment

ACCESSORIES

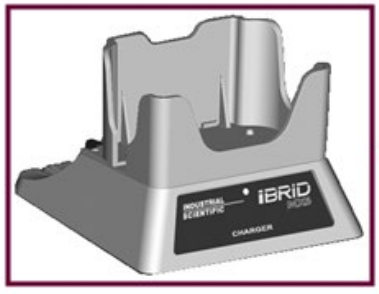


Extendable 6' Wand
Telescoping wand
NOUN: WAND
STOCK #: 33 991 271

External Water Stop Filter
NOUN: FILTER - MISC
STOCK #: 33 991 273

***MX6* Internal dust/water filter**
NOUN: FILTER-MISC INSTRUMENT
STOCK #: 33 991 274

MX6 Probe Tubing Kit
NOUN: PROBE
STOCK #: 33 991 275



***MX6* Charger**
NOUN: CHARGER
STOCK #: 33 991 283

***MX6* Nylon Carrying Case with Neck Strap and probe holder**
NOUN: CASE
STOCK #: 33 991 285

NOT PICTURED:
- Docking station filter: **FILTER-MISC – 99 991 280**

ATTACHMENT B (Continued)

Regulator (650L)
NOUN: REGULATOR
Stock #: 39-984-783

Gas – 25ppm H_2S (650L)
NOUN: GAS
Stock #: 76-188-185

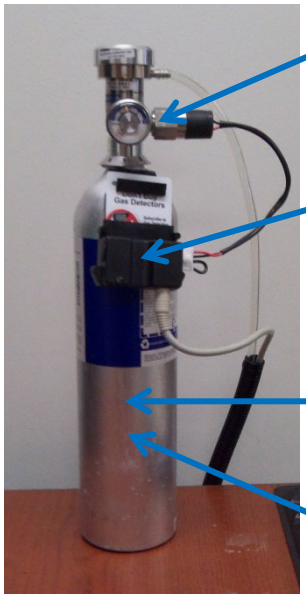
Gas – 5ppm SO_2 (650L)
NOUN: GAS
Stock #: 76-188-186

Mixed Gas – 25ppm H2S / 100ppm CO / 25% LEL Pentane / 18% O2 (650L)
NOUN: GAS
Stock #: 76-188-320

Mixed Gas – 25ppm H2S / 100ppm CO / 25% LEL Pentane / 18% O2 / 5ppm SO_2 (650L)
NOUN: GAS
Stock #: 76-188-322

Docking Stations
*Not stocked. Notify Safety to order
Left: personal H_2S or SO_2 monitor
Right: MX6 docking station

***Calibration gas cylinders must be secured.**



Regulator (58/116L)
NOUN: REGULATOR
Stock #: 39-984-788

Card Reader
NOUN: CARD
Stock #: 33-991-281

Gas – 25ppm H_2S (116L)
NOUN: GAS
Stock #: 76-188-176

Gas – 5ppm SO_2 (58L)
NOUN: GAS
Stock #: 76-188-181

NOT PICTURED

Mixed Gas - 25% LEL Pentane / 18% O2 / 100 ppm CO (552L)
NOUN: GAS
Stock #: 76-188-175

Regulator (552L)
NOUN: REGULATOR
Stock #: 39-984-785

ATTACHMENT C

MX6 IBRID Bump Check Requirements: 7 Easy Steps

Performing a Bump Check:

1. Check gas expiration date.

2. Check gas pressure level.

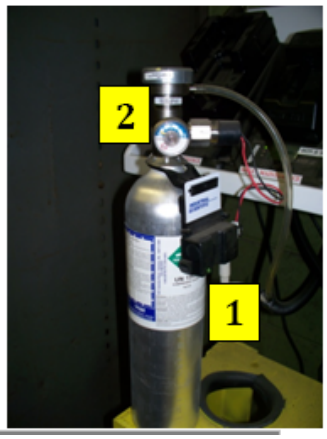
3. Place detector in the docking station… Wait.

4. Docking station will perform a fresh air zero and bump check. A"Green" LED will light when bump check is passed

5. If the monitor fails the bump check, the docking station will automatically calibrate the monitor. Monitor is ready to use if "Green" LED lights. If "Red" LED lights, do not use monitor

6. Update Bump Check Record tag

7. Tag failed monitors for service



Gas Component	Acceptable Range	Optimum Level
LEL (Combustible)	13-30%	25%
O_2 (Oxygen)	15-19%	18 %
CO (Carbon monoxide)	50-120 ppm	100 ppm
H_2S (Hydrogen sulfide)	12.5-30 ppm	25 ppm