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Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)

Operations Document

Metal Parts Treater Monitoring Plan

Contract W52P1J-09-C-0013

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prepared by
Bechtel Parsons Blue Grass Team (BPBGT)

prepared for
Program Executive Office –
Assembled Chemical Weapons Alternatives (PEO ACWA)

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1.0 PURPOSE

This plan provides an overview of the agent air monitoring concept for thermally decontaminated projectile trays and secondary waste trays prior to their release from the Metal Parts Treater (MPT) train and associated engineering controls for agent hazard.

2.0 SCOPE

This plan outlines monitoring requirements necessary to support Main Plant chemical warfare agent destruction activities, including:

- MPT monitoring system requirements for chemical warfare agents (CWAs) GB and VX in MPT Cooling System (MCS) chamber exhaust
- MPT monitoring method classification
- MPT monitoring technologies
- MPT monitoring levels
- MPT monitoring operational strategy for release of decontaminated materials
- Monitoring-specific limiting conditions of operation
- Recovery operations associated with chemical agent detection

3.0 METAL PARTS TREATER MONITORING

3.1 Process Overview

Two inductively heated MPTs will be used to decontaminate drained projectiles and secondary waste by raising their internal temperature to 1,000 ^{o}F for 15 minutes. After these conditions are achieved, decontaminated material is moved from the MPT main chamber to the MPT outlet airlock (OAL) where it is cooled before being released into the MCS chamber where it is further cooled.

Decontamination is verified by ensuring that materials are held at 1,000 ^{o}F for a minimum of 15 minutes. As a best practice, the Bechtel Parsons Blue Grass Team (BPBGT) will perform agent air monitoring of MCS exhaust during both primary and secondary waste operations.

3.2 MPT Monitoring System Requirements

Information obtained from MPT MCS chamber exhaust monitoring will be used to provide additional assurance that MPT thermal treatment effectively decontaminates primary and secondary wastes and that engineering controls for agent hazard are working properly.

Reliable use-to-use monitoring performance is required. Monitoring instruments must perform their intended function when called upon to do so.

Requirements for effective MPT/MCS exhaust monitoring include:

1. Monitoring shall be performed using instruments and methods selected to measure the proper parameters for the specific chemical agent of concern at its associated monitoring level.
2. Instruments and methods used shall be sufficiently sensitive and precise to reliably measure at the concentration threshold levels described in subsequent sections.
3. Samples shall be collected and analyzed while decontaminated trays are being cooled in the MCS chamber. At the maximum processing rate, no more than one sample per hour is anticipated per MPT train, which will correspond to one sample per tray in the MCS of each MPT. On average, the number of process air samples collected and analyzed is expected to be substantially fewer in number.
4. Sampling locations on the MCS exhaust shall be selected to provide rapid identification of any potential off-gassing agent hazard within the MCS chamber.
5. Sampling locations on the MCS exhaust shall be selected such that Monitoring personnel have access to distal sampling ends.
6. Instruments and methods used by the Laboratory and Monitoring organization shall include those specifically developed or reviewed by the Program Executive Office – Assembled Chemical Weapons Alternatives (PEO ACWA) Risk Management Directorate (RMD) to monitor chemical agents in air.
7. Exhaust temperature must be sufficiently cool to allow proper monitoring. Outside air used for cooling through the chamber shall ensure the maximum temperature sample line temperature and monitoring instrument temperature limits are not exceeded during a sampling event.
8. Mist and water deluge of the MCS chamber must not be active during the monitoring cycle to avoid water- and humidity-based monitoring interference. Manual or automatic stream selection are required.
9. Two sample lines (one for DAAMS and one for MINICAMS®) will exist for each monitoring location. A separate exhaust line will return to the MCS.
10. Implementation of blow back air using instrument air through the sample line, into the exhaust duct, may be employed. When the MCS is not being monitored, dust or chemicals may contaminate the open-ended sampling line.

3.3 MPT Monitoring Method Classification

Implementation of this plan requires the use of monitoring methods for the characterization of air samples. Analysis of air samples may only be used to provide additional assurance that primary and secondary wastes have been thermally decontaminated. As a minimum, a Class III method is required for this type of process monitoring. Class III methods are qualitative, providing a positive or negative detection of an analyte at a designated response level.

3.4 MPT Monitoring Technologies

MINICAMS, a near-real-time (NRT) monitoring instrument, will be used to perform agent vapor concentration measurement. These instruments are operated over a sampling and analytical cycle of less than 15 minutes. A single-cycle monitoring result is required.

Depot Area Air Monitoring System (DAAMS) will be used to confirm or refute a positive measurement from the primary NRT-based monitoring system. Confirmation may be qualitative or quantitative according to operational-specific requirements. The confirmation method shall be able to confirm either the presence (qualitative confirmation) or presence and concentration (quantitative confirmation) of the agent within the same concentration range of the primary NRT method.

3.5 MPT Monitoring Levels

Methods that are certified to the agent-specific vapor screening level (VSL) are required. The VSL is an agent control limit applied to process or operational monitoring as opposed to the evaluation of worker exposure.

The VSL is equivalent to the numerical concentration value of the short-term exposure limit (STEL) for each of the chemical agents:

GB: 1.0×10^{-4} mg/m^3
VX: 1.0×10^{-5} mg/m^3

If required, the sampling system will use conditioned dilution air to overcome environmental interferent issues associated with moisture, unconditioned air impurities, or particulates in the MCS cooling exhaust; sample dilution will not exceed 10-fold. The target control limit will be VSL; the target control level may not exceed 10 VSL if dilution is required. Alarm levels for the MINICAMS unit are specified in 24915-00-9MP-AMS-00001, *MINICAMS/DAAMS Monitoring Table*.

3.6 MPT Monitoring Operational Strategy

Monitoring of MPT OAL exhaust will not be performed when thermally decontaminated trays are present in the OAL. Instead, trays in the OAL will be allowed to move forward into the MCS cooling chamber. The MCS rolldown door will be closed when a tray is moved into the cooling chamber. After the OAL gate has been closed, MCS chamber exhaust will be monitored for potential agent vapor prior to release of the tray from the MCS chamber.

If no confirmed agent is detected in accordance with the MPT monitoring levels, the MCS chamber door will be opened and the tray moved into the cool down area (cooling conveyor).

If confirmed agent is detected, the tray in the MCS chamber will be backed into the OAL and then into the MPT main chamber for further decontamination.

3.7 Monitoring-Specific Limiting Conditions of Operation

System-specific limiting conditions of operation include:

- The agent monitoring system servicing the MPT monitoring operation must be in control and available.
- Ventilation airflow through the MCS (blower operation) is required and the blower operating normally.
- The MCS particulate filter housings must be equipped with activated carbon filter candles as specified.

3.8 Recovery Operations Associated with a Positive Chemical Agent Response

Recovery capability from a confirmed agent detection is required. If a tray contains contaminated materials after passing through the main chamber, it will be returned to the MPT main chamber for further decontamination.

After a contaminated tray has been removed from the MCS chamber, the chamber internal surfaces and downstream ductwork/housings could become contaminated. Evaluation of potential contamination/hazard and decontamination requirements in accordance with 24915-GEN-5PL-00-00006, *Equipment Decontamination Plan*, is required.

Although levels of agent vapor that could contaminate condensed moisture in the filter housing sumps are not likely, samples of liquid condensate (if present) shall be collected and transported to the Laboratory for analysis and disposition decisions.

If the filters were not exposed to agent vapor concentrations above the VSL, they are not contaminated and no special precautions are required. Changeout is not required.

If the filters were exposed to agent vapor levels above VSL, the encapsulated candle carbon is contaminated by definition. Changeout is required.

Levels of agent vapor that contaminate the filter carbon are not expected to make the carbon unsafe to handle for packaging and disposal in terms of potential off-gas vapor hazard. Initial monitoring of the filter house interior in an unventilated condition may be employed to assess potential worker hazard prior to filter removal.

Contamination status of equipment will be verified in accordance with the *Equipment Decontamination Plan* (24915-GEN-5PL-00-00006).

Removed candles will be managed as hazardous waste.

Assessment of appropriate personal protective equipment for hazardous waste is required.

4.0 REFERENCES

- 24915-00-9MP-AMS-00001, *MINICAMS/DAAMS Monitoring Table*
- 24915-GEN-5PL-00-00006, *Equipment Decontamination Plan*

DOCUMENT EDITORIAL CORRECTION, CHANGE, OR DEACTIVATION (DECOD)

☒ Editorial Correction ☐ Change ☐ Deactivation (Cancelation) (No superseding document) ☐ Deactivation (Supersede) (Identify superseding document)

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