Consumers Energy Company

Overisel Compressor Station

Hamilton, Michigan

40 CFR Part 63, Subpart HHH

EUDEHY

CPMS Site-Specific Monitoring Plan

Effective Date: November 1, 2021

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Driver: Regulatory

Monitoring Plan Revision History[1]			
Revision No.	**Revised By**	**Revision Date**	**Comments (e.g. Description of Revisions)**
0	AD Kapuga	October 25, 2021	Draft
1	AD Kapuga	April 15, 2022	Final Draft with TO Temperatures

[1]Revisions must be retained for 5 years from the date of the revision.

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ATTACHMENTS

1.0 Purpose

The purpose of this Plan is to describe the continuous parameter monitoring system (CPMS) to be used at Overisel Compressor Station to meet the requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAPS) from Natural Gas Transmission and Storage Facilities – Maximum Achievable Control Technology (MACT), Subpart HHH of 40 CFR part 63. These regulations require the control and continuous parameter monitoring of air pollution control equipment associated with glycol dehydration systems, including thermal oxidizers. This Site Monitoring Plan must be available for review if requested by the EPA or delegated state or local air quality agency.

Contact Person
Any questions in regard to this Site Monitoring Plan should be directed to the Field Leader for Overisel Compressor Station.

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1.1 Scope

This Site Monitoring Plan applies to the Overisel Compressor Station, located at 4131 138th Avenue, Hamilton, MI, which is wholly owned and operated by Consumers Energy Company.

1.2 Definitions

Administrator means the regulatory agency that is responsible for the administration of the MACT regulation; this could be EPA, or EGLE.

Bypass means to route gas around a control device.

Closed-Vent System is a system that is not open to the atmosphere and is composed of piping, ductwork, connections, and if necessary, flow inducing devices that transport gas or vapor from an emission point to one or more control devices. If gas or vapor from regulated equipment is routed to a process (e.g., to a fuel gas system), the conveyance system shall not be considered a closed-vent system and is not subject to closed-vent system standards.

Continuous Recorder is a data recording device that either records an instantaneous data value at least once every hour or records hourly or more frequent block average values.

CPMS means continuous parameter monitoring.

EPA means United States Environmental Protection Agency.

MACT means Maximum Achievable Control Technology.

Malfunction means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. This definition is provided for information only. Operations should consult with the Field Leader to determine whether or not a malfunction has occurred due to any unit alarm or shutdown for purposes related to the Maximum Achievable Control Technology (MACT) rules.

Safety Device is a device that meets both of the following conditions: the device is not used for planned or routine venting of liquids, gases, or fumes from the unit or equipment on which the device is installed; and the device remains in a closed, sealed position at all times except when an unplanned event requires that the device open for purpose of preventing physical damage or permanent deformation of the unit or equipment on which the device is installed in accordance with good engineering and safety practices for handling flammable, combustible, explosive, or other hazardous materials. Examples of unplanned events which may require a safety device to open include failure of an essential equipment component or a sudden power outage.

Shutdown means the cessation of operation of a glycol dehydration unit for purposes including, but not limited to: periodic maintenance, replacement of equipment, or repair.

Small glycol dehydration unit is a glycol dehydration unit, located at a major source, with an actual average natural gas flowrate less than 283.0 thousand standard cubic meters per day or actual annual average benzene emissions less than 0.90 Mg/yr.

Startup means the setting into operation of an affected source, or portion of an affected source for any purpose.

Temperature Monitoring Device is an instrument used to monitor temperature and having a minimum accuracy of ±2 percent of the temperature being monitored expressed in °C, or ±2.5 °C, whichever is greater. The temperature monitoring device may measure temperature in degrees Fahrenheit or degrees Celsius, or both.

2.0 Procedure

This section provides information on the affected emission units and the associated CPMS instrumentation and equipment. The CPMS Monitoring Plan must include monitoring system design specification and equipment performance criteria for the sample interface, detector signal analyzer, and data acquisition and calculations.

2.1 Affected Source(s) and Associated CPMS Equipment

Consumers Energy's Overisel Compressor Station (N5792) is a natural gas compression station. The purpose of the facility is to maintain pressure of natural gas in order to move it in and out of storage reservoirs and along the pipeline system. There are two (2) redundant affected sources (glycol dehydration units) installed at the station that are used to remove moisture from natural gas withdrawn from the storage fields, as follows:

Emission Unit ID	Emission Controls	CPMS Metric	CPMS Value (Daily Avg)
EUDEHY1	Thermal Oxidizer	Temperature	≥1,460°F
EUDEHY2	Thermal Oxidizer	Temperature	≥1,510°F

2.2 Control Equipment Requirements

The emission limit must be met by connecting the process vent to a control device, or combination of control devices, through a closed-vent system. The required closed-vent system shall route all gases, vapors, and fumes to a control device that meets all of the following criteria:

- Designed and operated with no detectable emissions
- If the closed-vent system contains one or more bypass devices that could be used to divert all or a portion of the gases, vapors or fumes from entering the control device, you must meet the following:
  - *At the inlet to the bypass device, properly install, calibrate, maintain and operate a flow indicator that is capable of taking periodic readings and sounding an alarm when the bypass device is open;* ***or***
  - *Secure the bypass device valve in the non-diverting position using a car-seal or a lock-and-key type configuration*
  - *Low leg drains, high point bleeds, analyzer vents, open-ended valves or lines and safety devices are not subject to this requirement*

EUDEHY does not contain any bypass devices.

2.3 Inspection & Monitoring

Required Inspections

Each closed-vent system shall be inspected as follows:

- For joints, seams, or other connections that are permanently or semi-permanently sealed:
  - Conduct an initial inspection to demonstrate that the closed-vent system operates with no detectable emissions
  - Report inspection results with the Notification of Compliance Status Report
  - Conduct annual visual inspections for defects that could result in air emissions (ie: visible cracks, holes or gaps in piping; loose connections; broken or missing caps or other closure devices)
- In addition, for components other than those listed above, conduct annual inspections to demonstrate that the components or connections operate with "*no detectable emissions*".

Report all inspection results in the Periodic Report

Difficult to Inspect Equipment

- Identify any equipment that cannot be inspected without elevating the inspecting personnel more than 2 meters above a support surface.

- Inspection is this equipment is required at least once every 5 years

Unsafe to Inspect Equipment

- Identify any equipment where the inspecting personnel would be exposed to an imminent or potential danger.

- Inspection of this equipment is required as frequently as practicable during safe-to-inspect times.

Required Monitoring

Install, calibrate, operate & maintain a temperature monitoring device, equipped with a continuous recorder, to measure the combustion chamber temperature for each thermal oxidizer.

- Establish a minimum operating parameter value to define the conditions at which the control device must be operated to continuously achieve the applicable performance requirements.

Emission Unit ID	Minimum T.O. Operating Temperature
EUDEHY1	≥1,460°F
EUDEHY2	≥1,510°F

- Using data recorded by the monitoring system, calculate the daily average for each monitored operating parameter for each operating day

2.4 System Design Considerations

The purpose of the CPMS is to:

- Continuously monitor the combustion chamber temperature of each thermal oxidizer.
- Record the temperature at least once every 15 minutes.
- Average the data on a block-hour.
- Calculate a daily average based on the block-hour data.

2.4.1 Temperature Measurement Device Specifications

The following specifications apply to the temperature measurement devices:

Parameter	Specification
Location	The temperature sensor shall be installed at a location representative of the combustion zone temperature.
Device Type	Thermocouple
Tolerance	±2 percent of the temperature being monitored in °C, or ±2.5 °C, whichever value is greater [63.1283(d)(3)(i)(A)]

2.4.2 Data Acquisition System

The Supervisory Control and Data Acquisition (SCADA) system uses Programmable Logic Controller (PLC) to monitor and control systems. The PLC takes a signal from the thermocouple, located in the combustion chamber temperature of the thermal oxidizer, and converts it to engineering units to be sent to the HMI's and to the SCADA computer. A Historian computer is connected to the SCADA network using Ethernet. A XL Reporter program resides on the Historian computer.

The XL Reporter provides the following readouts:

- 15-minute snapshot temperature readings
- 1-hour average temperatures
- Daily average temperatures

In the event of a failure of the Historian computer, or the network connection, a chart recorder is used as a redundant backup.

2.4.3 Reporting System

The Historian PC with reporting software is connected to the SCADA network. The reporting software is used to collect data from the PLC, collate into a report for printing, and for long-term retention of the data.

3.0 Temperature Monitoring System Performance Evaluation and Periodic QA/QC Procedures

3.1 Periodicity

The requirements for periodic audits consist of equipment requirements and procedural requirements. All equipment has to be calibrated and meet general requirements for accuracy: (1) An accuracy hierarchy of at least three, and (2) an accuracy that is NIST-traceable. An exception to the accuracy requirements for instruments that are used to audit the accuracy of the CPMS is when performing an accuracy audit using a redundant sensor, the redundant sensor would have to have an accuracy equal to or better than the accuracy of the primary sensor.

A factory calibrated unit was installed on each of the units. The calibration certification sheets, or other appropriate documentation, shall be retained demonstrating factory calibration. Annual audits of the CPMS shall be conducted as described below.

3.2 Methodology

One of the following methods shall be used for performance evaluations:

3.2.1 RTD Replacement

The RTD shall be replaced with a factory calibrated unit meeting the design requirements listed above. The calibration certification sheet, or other appropriate documentation, shall be retained demonstrating factory calibration.

Concurrently, a calibrated RTD simulator shall be used to test the remaining elements of the CPMS system in accordance with manufacturer's recommendations and company policies and procedures. A written work plan or SAP work order documenting steps to be followed shall be used.

3.2.2 Calibration

The performance of the temperature RTD shall be checked in-place (validated by using an Ametek Jofra Temperature Calibrator, or equivalent). Test equipment will be calibrated using the listed standards which are traceable to the International System of Units through the National Institute of Standards. The calibration of the thermocouple and SCADA shall be done in accordance with manufacturer's recommendations and company policies and procedures. A written work order documenting steps to be followed shall be used.

3.3 Accuracy

The accuracy criteria for the validation check is ±2 percent of the temperature being monitored in °C, or ±2.5 °C (36.5°F), whichever value is greater [63.1283(d)(3)(i)(A)]. The thermal oxidizer combustion chamber temperature is required to be maintained above the established operating condition. Therefore, the system accuracy criterion for the CPMS is ±2 percent of the temperature being monitored.

3.4 Notification

Notification to EGLE prior to conducting the performance evaluation or with results after testing is not required.

3.5 Documentation

Closeout of the work order shall be considered sufficient documentation provided factory calibration sheets, field readings, and/or other results, as appropriate, are included in the closeout comments or attached to the work order.

3.6 Malfunctioning CPMS

Operation of the unit while troubleshooting a malfunction of the CPMS is acceptable. Possible indications of a malfunction include, but are not limited to:

- Temperatures out of range (high or low)
- Failure to generate daily printouts of the logs
- Erroneous or nonsensical data on the printed logs
- Failure of the visual display of temperatures from the SCADA

3.6.1 Recordkeeping and Reporting

Logs documenting the malfunction of the CPMS, immediate actions and corrective actions shall be taken in accordance with Section 5.3 of this plan. Additionally, the Environmental Department shall be notified immediately of the malfunction.

3.6.2 Troubleshooting a Malfunctioning CPMS

Overisel shall troubleshoot the CPMS according with the manufacturer's recommendations, company policy and procedures and good operating practices.

4.0 CPMS Operation and Maintenance

4.1 CPMS Operation

The CPMS will be in continuous operation whenever the monitored glycol dehydrator operates. Data will be collected as follows:

- Record the thermal oxidizer combustion chamber temperature at least once every 15 minutes, not including periods of startup, shutdown or malfunction
- Average the 15-minute data on an hourly basis.
- Calculate the daily average for each operating day.
- Compare the daily average to the minimum operating parameter value.

Alarms and shutdowns shall be provided as follows:

- The CPMS shall alarm when the thermal oxidizer combustion chamber temperature reaches 1480°F decreasing or 1800°F increasing.
- The unit will shut down if the thermal oxidizer combustion chamber temperature exceeds 1800°F.

4.2 CPMS Maintenance

4.2.1 Preventative Maintenance

CPMS maintenance will be conducted in according with company policy and procedures. Additionally, daily station walkdowns take place to check on obvious signs of physical failure of the equipment.

4.2.2 Corrective Maintenance

Corrective maintenance will be conducted according to manufacturer's recommendations, company policy and procedures, and good operating practices, in a manner consistent with safety and good air pollution control practices for minimizing emissions in the event of a CPMS malfunction, impending malfunction, or out-of-control CPMS. In lieu of conducting immediate corrective maintenance, operations may shutdown the associated engine until such time as corrective maintenance can be performed.

4.3 Spare Parts

A set list of spare parts of the CPMS will not be maintained in inventory. If a spare part for the system is not available when needed, the affected equipment will be shut down until such time as the necessary spare part can be procured and installed.

5.0 Data Management

5.1 Valid Data

Valid data is defined as data not "recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities". Specifically, valid data is comprised of:

- 15-minute readings
- Hourly averages consisting of valid 15-minute readings
- Daily averages consisting of valid hourly averages

5.2 Data Review

Operations shall review the CPMS daily reports to:

- Confirm all required data was collected
- Identify any data collected that was not valid data, as defined above
- Confirm that no exceedances of the average daily temperature limits occurred

Missing data may be recovered by:

- Forcing a new printout
- Recover data from SCADA/PLC
- Chart recorder

If missing data is unrecoverable (e.g., due to power failure), exceedances are identified, or non-valid data is identified, the Environmental Services Department shall be notified immediately. Additionally, in the event of repeated instances of missing data, whether recoverable or unrecoverable, over a short duration of time, an investigation as to the causes is to be conducted.

5.3 Recordkeeping

The following records collected by the CPMS are required to be retained for a period of five years. At a minimum, the most recent two-year data shall be available on site. The other three years data may be stored off site, but should be accessible within a reasonable time. These records can be retained either electronically, via hard copy, or both, and shall be easily accessible.

- Each daily average
- Each hourly average used to calculate the daily average values
- Each 15-minute data point used to calculate hourly averages
- The algorithm/calculation procedure used to reduce data
- All readings taken during periods of CPMS breakdowns and out-of-control periods

Additionally, documentation of the following shall be retained regarding the CPMS:

- The date and time identifying each period during which the CPMS was inoperative
- The date and time identifying each period during which the CPMS was out-of-control
- The date and time of commencement and completion of each time period where the CMPS daily average temperature was out of the specified limits in this plan
- The nature and cause of any malfunction (if known)
- The corrective action taken or preventative measures adopted

- The nature of the repairs or adjustments to the CPMS that was inoperative or out of control
- The total process operating time during the reporting period
- Documentation of any QA/QC procedures performed for CPMS

5.4 Reports

5.4.1 Daily Data Reports

A daily report for each unit shall be generated and printed after midnight for the previous calendar day. The report shall include, at a minimum, the following:

- Each 15-minute data sample of the thermal oxidizer combustion chamber temperature
- Hourly averages of the thermal oxidizer combustion chamber temperature
- Daily averages of the thermal oxidizer combustion chamber temperature

5.4.2 Compliance Reports

The following compliance notifications/reports are required:

- Immediate notifications of non-compliance
- Semiannual reports and annual compliance reports
- Notification of malfunctioning and out-of-control CPMS events
- Notification of intent to conduct performance test
- Notification of compliance status at the completion of performance tests

6.0 Program of corrective action for a malfunctioning CPMS

The CPMS (thermocouple and SCADA system) is required to measure thermal oxidizer combustion chamber temperature. This temperature must be monitored continuously at all times the glycol dehydration units are operating.

NOTE: Malfunction events do not include events caused, in part, by poor maintenance or careless operation.

Possible Malfunction Events:

- SCADA failure
- Thermocouple Not Working

SCADA Failure

Event Definition: The Supervisory Control and Data Acquisition (SCADA) system uses Programmable Logic Controller (PLC) to monitor and control systems. The PLC takes a signal from the thermocouple, located in the combustion chamber temperature of the thermal oxidizer, and converts it to engineering units to be sent to the HMI's and to the SCADA computer. A Historian computer is connected to the SCADA network using Ethernet. In the event of a failure of the Historian computer, or the network connection, a chart recorder is used as a redundant backup.

Event Procedures:

If the SCADA System is not working, restore system operation as soon as practical. Procedures for this event may include:

- Record date & time of event beginning.
- Troubleshoot per manufacturer's recommendations and company policies and procedures, including reinstallation of software, inspection/repair of power or communications connections and wiring, if required.
- Confirm restoration of data acquisition system operation. Record date & time of event ending
- Complete log and prepare Inlet Temperature Event Checklist to document actions taken to respond to this malfunction.

Thermocouple Not Working or Working Improperly

Event Definition: Thermocouple not working, or working improperly

Event Procedures:

If the thermocouple is not working or working improperly, restore system operation as soon as practical. Procedures for this event may include:

- Record date & time of event beginning.
- Thermocouple input failure will be logged
- Conduct troubleshooting per manufacturer's instructions.
- Identify required adjustment, repair, or replacement, per manufacturer instructions and company policies and procedures. Complete required actions.
- Thermocouples cannot be calibrated. Once replaced, the new thermocouple will be checked for accuracy by using the standard thermocouple testing method (refer to Sections 3.2 and 3.2.1).
- Repair information will be on the inlet temperature event checklist

ATTACHMENT 1

CPMS Event Checklist

Combustion Chamber Temperature Event Checklist

Completed by:_____ **Date:**_____

Type of Event:

- ☐ **Thermocouple Not Working**
- ☐ **Other*** _____

Thermocouple Not Working

- **Date & Time Noted TC Not Working:** _____
- **Data & Time Last Data Recorded:** _____
- **Date & Time Recorder Operation Restored:** _____
- **Reason for Recorder Failure, if known:** _____

_____

_____

- **Did you follow manufacturer's procedures for troubleshooting?** ☐ **YES** ☐ **NO***
- **Did you repair or replace the data recorder?** ☐ **REPAIR** ☐ **REPLACE**
- **Did you re-calibrate per manufacturer procedures?** ☐ **YES** ☐ **NO***

Other*:

Describe what happened:

_____

_____

_____

When did this event begin: _____

When did this event end: _____

Describe the actions you took to respond:

_____

_____

_____

_____