DTE Electric Company

Oliver Peaking Facility

Startup, Shutdown, Malfunction (SSM) and Continuous Parameter Monitoring System (CPMS) Plans

REVISION #2

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SECTION 1: INTRODUCTION

1.1 Purpose and Requirements

This document includes the systems and procedures for the DTE Electric Company (DTE) peaking units located at 346 N Gagetown Road Pigeon, MI, 48755, hereafter referred to as the Oliver Peaking Facility (SRN B2796). These remote peaking units are maintained by the Peakers Group within DTE, and are diesel-fired reciprocating internal combustion engines (RICE). Each of these engines are subject to the requirements of the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Source Categories, 40 CFR Part 63. These regulations are referred to as the MACT standards and the applicable rules for RICE are contained in 40 CFR Part 63, Subpart A (the General Provisions applicable to all Part 63 source categories) and Subpart ZZZZ.

These RICE are required to be equipped with emission control devices and associated monitoring equipment. Monitoring parameters must be implemented for each control device and must demonstrate compliance with the standards. A source that is required to use a Continuous Monitoring System (CMS) for measurement of the above mentioned operating parameters must also develop and implement a CPMS quality control program, pursuant to 40 CFR 63.6625(b)(1) and 63.8 (d).

A Startup, Shutdown and Malfunction (SSM) plan in order comply with the specific startup, shutdown and malfunction requirements of 40 CFR 63 Subpart ZZZZ. This plan can be found in Section 4 of this document. This SSM plan does not address the general SSM plan requirements of 40 CFR 63 Subpart A, as they are not applicable to Olivers Peaking Facility, pursuant to Table 8 of 40 CFR 63 Subpart ZZZZ.

1.2 Plan Maintenance and Updates

DTE maintains a complete copy of both the CPMS and SSM Plan (Plan) on-site. Copies of the Plan are maintained in the control room, or at other operations areas on-site. DTE has the overall responsibility to ensure that the Plan is maintained and updated as required by the rules. Environmental Management & Safety (EM&S) works with the Operations/Maintenance personnel to obtain the information needed to maintain and update the Plan. Specific requirements governing maintenance for the CPMS and SSM plans can be found as a subpart in their respective sections.

1.3 Site Overview

The Peaker units located at this facility were manufactured by GM Power Electro-Motive Division, La Grange, Illinois, with a rating of 2.5 Megawatts (MW) and a Maximum Load of 2.75 MW. The site consists of five identical units, see Table 1.1. The site also maintains a 30,000 gallon aboveground storage tank (AST) containing Diesel fuel for the generators. When all five units are on, the site uses approximately 800 gallons per hour. A facility layout is provided in Figure 1.1.

Table 1-1: Oliver Peaking Facility Emission Unit Inventory

Location Title	Unit ID	Manufacturer	Model Type	Serial No.	Installation Date	Rating (MW)
Oliver Peaking Facility	11-1	GM Power	MP-45-B	63801	January 1970	2.5
	11-2	GM Power	MP-45-B	63800	January 1970	2.5
	11-3	GM Power	MP-45-A	63798	January 1970	2.5
	11-4	GM Power	MP-45-B	63802	January 1970	2.5
	11-5	GM Power	MP-45-B	63799	January 1970	2.5

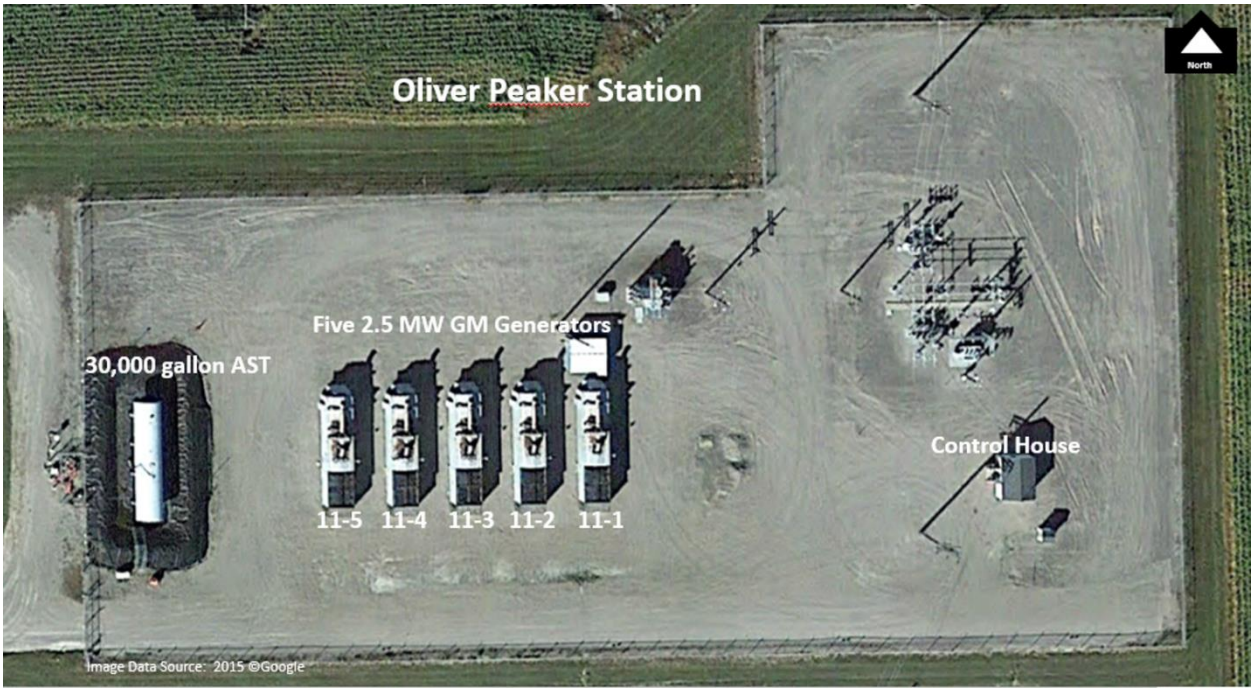

Figure 1-1. The facility consists of five 2.5 MW generators, a 30,000 gallon aboveground storage tank (AST), a control house and a substation.

SECTION 2: PROCESS DESCRIPTION

DTE remotely operates multiple peaking facilities used during peak power demand times to provide additional power to the grid at predetermined locations. The remote Peaker facilities operate diesel-fired reciprocating internal combustion engines (RICE). Each stationary RICE is equipped with a diesel oxidation catalyst (DOC) for the purpose of reducing emissions during operation. Included with this system is a continuous parameter monitoring system (CPMS) consisting of DOC monitoring points that record: control device inlet gas temperature, pressure drop across the catalyst bed, and date / time stamps of all records. These data points are then archived by DTE's PI system.

SECTION 3: CONTINUOUS PARAMETER MONITORING SYSTEM PLAN (CPMS)

3.1 Monitoring Plan

This monitoring plan addresses the monitoring system design, data collection, and the quality assurance and quality control elements outlined in the paragraphs 40 CFR 63.6625(b)(1) and in § 63.8(d). Each CPMS is installed, operated, and maintained according to procedures in this monitoring plan.

3.1.1 Equipment Performance Criteria and Design Specifications

The Dynalco Catalyst Monitor (Catalyst Monitor) provides continuous monitoring of catalyst inlet temperature and differential pressure, which is mandated by RICE NESHAP on diesel ignited engines. This monitoring system reads up to six input channels, calculates differential values, provides alarm / shutdown outputs, as well as allows all parameters to be logged to internal flash memory. Internal flash memory may be remotely accessed via the PI computer program, or downloaded directly from the unit.

The Catalyst Monitor is in "stopped" mode until a run indication is sensed by either a contact closure or magnetic pickup input. Once the "running" mode is sensed, the Catalyst Monitor reads all six channel inputs at a rate of 100 milliseconds per channel. Additionally, the temperature sensor has an appropriate sensitivity of 2.8 degrees Celsius (minimum tolerance), or 1 percent of the measurement range, whichever is larger. If an input crosses an over or under threshold (See the Table 3-1), the unit will show a flashing red LED on the front panel of the monitor, as well as initiate an output trip (solid-state relay) that can be used for alarm or shutdown. Whenever a trip threshold is crossed the Catalyst Monitor stamps the event with a date and time. These events are also logged by the Peaker Operator (DTE employee) and the System Operations Center (SOC) staff. The monitor logs the last ten events for each channel input. The Catalyst monitor's operating manual is included in this report as Appendix A.

Once the initial system configuration is complete, the Catalyst Monitor will set off an alarm when channel or differential values are above or below the limits specified in the set up procedure (See Table 3-1). The Catalyst Monitor allows the user to configure any one channel to monitor the catalyst inlet temperature based on a 4 hour rolling average per the RICE NESHAP requirement. Once set up, this channel will log the inlet temperature at 15 minute intervals while the engine is running. In addition to inlet temperature, the Catalyst Monitor logs the catalyst differential pressure at defined intervals.

Table 3-1: Diesel Oxidation Catalyst Alarm Thresholds

Monitored Parameter	Malfunction Threshold
Pressure drop across the catalyst	Less than 2 inches of water
Engine exhaust temperature at catalyst inlet	1350 °F ≥ Temperature ≥450 °F

3.1.2 Sampling Interface

Catalyst bed inlet temperatures are taken via thermocouple located at the inlet to the DOC. Pressure drop is calculated via pressure measurements at the inlet and outlet of the DOC.

3.1.3 Equipment Performance Evaluations

Performance evaluations, system accuracy audits and other audit procedures are conducted in accordance with the Catalyst Monitor manual and manufacturer recommendations. These performance evaluations are conducted on a calendar year basis.

American Sensor Technologies Inc. does not have a documented evaluation process and stated that there is no calibration for their AST5100 Low Differential Pressure Transmitter, however based on the parameters outlined in Appendix F, the unit is functioning properly.

Duro-Sense also does not have a documented evaluation process for their K-type Thermocouple. However, through consultation with Duro-Sense, it was determined that a verification will be conducted annually. This verification will consist of placing another thermometer or thermocouple in the same medium as the thermocouple and comparing the temperature readings. The results should be within the standard specification limits indicated in Appendix G.

The Peakers Group will ensure that these performance evaluations are documented and supplied to EM&S. In the case that a unit unexpectedly goes into a maintenance outage before annual performance evaluations are performed, the performance evaluations must be completed as soon as the unit is repaired. This could result in a performance evaluation not being completed for a certain year.

3.1.4 Operating and Maintenance Procedures

The peaking facility site keeps the necessary parts for routine repairs on the Catalyst Monitor equipment readily available in the Control House in accordance with 40 CFR 63.8(c)(1)(ii). Refer to Catalyst Monitor manual (Appendix A) for a spare parts list. The Catalyst Monitor was installed in accordance with the Manufacturer's written recommendations for installation, operation, and calibration of the system. Information on the Catalyst Monitor installation, operation, calibration, and design can be found in the Catalyst Monitor manual or operation records available from the Peakers Group or EM&S.

3.1.5 Reporting and Recordkeeping

DTE maintains the following records for the Catalyst Monitor System to ensure compliance with 40 CFR 63.10(c) and (e):

- Catalyst inlet temperature and pressure drop;
- The date and time identifying each period during which the CMS was inoperative except for zero (low-level) and high-level checks;
- The date and time identifying each period during which the CMS was out of control;
- The specific identification (i.e., the date and time of commencement and completion) of each period of excess emissions and parameter monitoring exceedances, as defined in the relevant standard(s), that occurs during startups, shutdowns, and malfunctions of the affected source;
- The specific identification (i.e., the date and time of commencement and completion) of each time period of excess emissions and parameter monitoring exceedances, as defined in the relevant standard(s), that occurs during periods other than startups, shutdowns, and malfunctions of the affected source;

- The nature and cause of any malfunction (if known);
- The corrective action taken or preventive measures adopted;
- The nature of the repairs or adjustments to the CMS that was inoperative or out of control;
- The total process operating time during the reporting period; and
- All procedures that are part of a quality control program developed and implemented for CMS under § 63.8(d).

All performance evaluations are kept on record for the life of the affected source or until the affected source is no longer subject to § 63.8(d)(3). The records are available for inspections or upon request. DTE keeps previous versions of the performance evaluation plan on record for a period of 5 years after each revision of the plan.

The facility also maintains records of maintenance conducted on all stationary RICE located on-site in order to demonstrate compliance with operating procedures and the equipment maintenance plan. PSI downloads the catalyst data at a minimum semi-annually for semi-annual and annual ROP reporting. For the first semi-annual data download for the period from 1/1-6/30 the data is downloaded after 7/1. For the second semi-annual data download for the period from 7/1-12/31 the data is downloaded after 1/1. Under EPA regulation, startup time is not to exceed 30 minutes, after which time non-startup emission regulations apply [§63.6600(d)(Table 2c and 2d)]. After the data is downloaded by PSI, Tetra Tech is contracted to remove 30 minutes of startup data from each time a unit is started for a run. Tetra Tech follows the “Tetra Tech Peaker Catalyst Recalculation Procedure.”

SECTION 4: STARTUP, SHUTDOWN, MALFUNCTION (SSM) PROCEDURES

It is the facility's obligation to ensure that each stationary RICE, including its associated oxidation catalyst and monitoring equipment, is operated and maintained, in such a way that minimizes emissions (63.6605).

This Startup, Shutdown, Malfunction (SSM) plan complies with the specific startup, shutdown and malfunction requirements of 40 CFR 63 Subpart ZZZZ. This SSM plan does not address the general SSM plan requirements of 40 CFR 63 Subpart A (63.6(e)) as they are not applicable to this peaking facility pursuant to Table 8 of 40 CFR 63 Subpart ZZZZ.

In addition to the procedures below, each stationary RICE minimizes emissions by conducting performance tests as required every 8760 hours or 3 years, whichever comes first. Test plans containing the methodology and schedule are maintained in EM&S SharePoint, along with the performance test results.

4.1 Startup Procedures

A startup is defined as "the setting in operation of an affected source or portion of an affected source for any purpose." [§63.2]. Per ZZZZ, an engine startup is "the time from initial start until applied load and engine and associated equipment reaches steady state or normal operation. For stationary engine with catalytic controls, engine startup means the time from initial start until applied load and engine and associated equipment, including the catalyst, reaches steady state or normal operation." [63.6675].

This procedure has been set to minimize the engine's time spent at idle and minimize the engine's overall startup time in order to allow for the appropriate and safe loading of the engine. At all times, including startup, the engine exhaust is vented through the oxidation catalyst to reduce emissions. Under EPA regulation, startup time is not to exceed 30 minutes (63.6625(h)) , after which time non-startup emission regulations apply [§63.6600(d)(Table 2d(5)(a-b)]. Additionally, excessive idling at Startup may result in DOC error report (i.e., the temperature and pressure values violate the conditions in Table 3-1.

Normal Start

The facility initiates the startup procedure of the stationary RICE from the Control Room at Colfax, either at their own initiative, or by the SOC's request. These are the only Peakers in the network with DOCs that cannot be initiated by the SOC. During a normal start, once initiated, the startup consists of a rolling unit start where each unit has a 90 second start and idle delay, then goes in to a 10 second acceleration, 10-20 second synchronizing period, and then a 10-30 second loading period. The maximum total startup time for the units to come to loading is 180 seconds from the time of startup initiation.

Emergency Start

During a deadline emergency start, a startup similar to the normal startup occurs with a rolling unit start where each unit has a 26-36 second start and oil pressure delay, 10 second acceleration, 10-20 second synchronizing period, and then the loading breaker closes once the last unit has synchronized. The maximum total startup time for a deadline emergency start is 76 seconds from the time of startup initiation.

The Engine Operating Manual contains further details on the startup procedures and is attached as Appendix D, and can also be obtained from the Peakers Group or EM&S.

4.2 Shutdown Procedures

A shutdown is defined as "the cessation of operation of an affected source or portion of an affected source for any purpose." [§63.2]

During shutdown of each engine, exhaust is vented through the existing oxidation catalyst to minimize emissions.

4.3 Malfunction Procedures

A malfunction is defined as "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." [§63.2]. Per ZZZZ, a malfunction is "any sudden, infrequent, and not reasonably preventable failure of air pollution control 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." [63.6675].

Procedures for responding to an alarm are identified in the *Peakers Catalyst Alarm Response Process Map* (Appendix I) and the "Step-by-Step" procedure used by the Peakers Group (Appendix E). In general, the procedure is as follows:

Upon receiving a Peaker trouble alarm, the SOC dispatches an operator to the facility. Once on site, the operator will evaluate the alarm to determine whether it is a nuisance alarm or an actual malfunction/system problem. If it is a nuisance alarm, the operator will acknowledge the alarm & continue operation as normal.

If the alarm is not a nuisance alarm, the operator will report to the SOC that the unit is out of control. The SOC will arrange to have the unit shut down. The Peakers Group will contact PSI to trouble shoot the alarm using the unit manual (Appendix C). Should maintenance be required, the unit will not be restarted until the situation is addressed.

All alarms and responses will be documented in the log book at the facility. Additionally, RICE MACT testing is completed every 3 years. The most recent year for testing will be 2021, the methodology and schedule of which is contained in Appendix H. As the ROP states the permittee is not required to start up the engine solely to conduct the performance test. If the engine is non-operational, the permittee shall conduct the performance test when the engine is started up again. (40 CFR 63.6620(b))

4.4 Recordkeeping and Reporting

Records are retained for all operations for a period of five years in accordance with 40 CFR 63.6660 and 63.10(b)(1).

If a malfunction occurs during the reporting period, this is included in the semiannual compliance report in accordance with 63.6650(b). In accordance with 40 CFR 63.6650(c)(4), each malfunction instance will include the following:

- The number, duration, and description of the malfunction;
- Actions taken to minimize emissions; and
- Actions taken to correct the malfunction.

SECTION 5: QUALITY CONTROL PROGRAM

The owner or operator of an affected source that is required to use a CMS and is subject to the monitoring requirements of this section and a relevant standard shall develop and implement a CMS quality control program. As part of the quality control program, the owner or operator shall develop and submit to the Administrator for approval upon request a site-specific performance evaluation test plan for the CMS performance evaluation required in paragraph 40 CFR 63.8(e)(3)(i) of this section, according to the procedures specified in paragraph (e). In addition, each quality control program shall include, at a minimum, a written protocol that describes procedures for each of the following operations [40 CFR 63.8(d)(2)]:

5.1 Calibrations [40 CFR 63.8(d)(2)(i) and (ii)]

The initial calibration of the Catalyst Monitor follows the installation directions in the monitor manual. Any subsequent calibrations follow the guidelines and recommendations in the monitor manual. Procedures in the determination and/or adjustments required during calibration in order to account for calibration drifts are contained in the catalyst monitor manual.

5.2 Preventative Maintenance [40 CFR 63.8(d)(2)(i) and (ii)]

All maintenance conducted on the monitoring system is done in accordance with the manual. A list of the spare parts needed for regular maintenance of the catalyst monitor is also included in the Catalyst Monitor manual. Maintenance records are available from the Peakers Group.

5.3 Audit Procedures [40 CFR 63.8(d)(2)(v)]

The continuous catalyst monitor system date / time stamps all data collected and stores the data in an internal database. The catalyst monitor observes the inlet temperature and pressure, calculates the differentials, and sounds an alarm in the case that an over or under threshold has been crossed. See Section 3.1.1 for more details.

Performance evaluations, system accuracy audits and other audit procedures are conducted in accordance with the Catalyst Monitor manual and recommendations. These performance evaluations are conducted at least annually.

5.5 Record Keeping [40 CFR 63.8(d)(3)]

These written procedures are kept on record for the life of the affected source or until the affected source is no longer subject to the regulations.

The Facility must complete a review and evaluation of this SSM and CPMS Plans as needed. Evidence of these reviews shall be recorded in the plan.

Revision No.	Changes	Author	Date
0	Creation of Colfax site-specific SSM & CPMS Plans per 63.6625(b)(1) **Prior to 2015, all DTE ZZZZ peaking facilities utilized one plan (SSM & CPMS Plans, created April 2013, updated December 2014)*	Tetra Tech	07/2015
1	• Added this revision tracking & changes table • Added additional references and verbiage from ZZZZ • Removed Appendix H (RICE Test Plan), as this is stored separately in SharePoint • Made general administrative & clerical updates • Replaced old company logo with new DTE logo on cover page • Added a header to Plan • Added REV1 to document in header & on title page	Lisa Fishbeck	1/7/2021
2	• Added updated Peakers Catalyst Response Alarm process map • Added REV2 to document in header & on title page • Made general administrative & clerical updates	Stefanie Ledesma	11/2/2021