

**EMISSION TEST REPORT**  
**For**  
**CO Reduction Efficiency**  
**Catalyst on EU-ENG-3**  
**City of Marshall**  
**Marshall, MI**  
**May 27, 2015**

Comprehensive Emission Services, Inc  
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Project No. 5715

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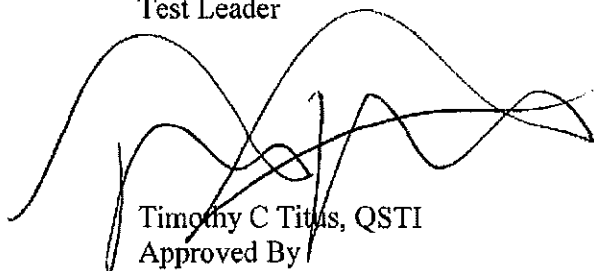
## PREFACE

This report was prepared by Comprehensive Emission Services, Inc. in response to an emission test that was conducted on a Fairbanks Morse 38TDD8 Generator (EU-ENG-3), at the City of Marshall Electric Power Plant. The testing was conducted at the facility in Marshall, MI on May 27, 2015. Any questions concerning this report should be directed to Mr. Matt Milligan or Mr. Tim Titus.

Comprehensive Emission Services Inc.



Matt Milligan  
Test Leader



Timothy C Titus, QSTI  
Approved By

Date: June 18, 2015

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**SECTION 1**

**INTRODUCTION**

An emission test was conducted by Comprehensive Emission Services Inc. on a Fairbanks Morse 38TDD8 Generator (EU-ENG-3) at the City of Marshal Electric Power Plant, located in Marshall, MI.

Coordinating the field test:

Tim Titus - Comprehensive Emission Services Inc.  
Tim Martin - Miratech Corporation  
Edward Rice - City of Marshall

Conducting the field test:

Matt Milligan - Comprehensive Emission Services, Inc.  
Adam Gehrts - Comprehensive Emission Services, Inc.

Observing the field test:

Tom Gasloli – Michigan Dept. of Environmental Quality

The results were used to evaluate the Generator with regards to the following:

CO Emission reduction efficiency

The appendices contain the following:

- Appendix A: Analyzer Data
- Appendix B: Plant Process Data
- Appendix C: Monitor Calibration Data
- Appendix D: Protocol 1 Certification Sheets
- Appendix E: Certificates of Accreditation

## SECTION 2

### SUMMARY OF RESULTS

Table 1 summarizes the test results for testing at the City of Marshal Electric Power Plant, located in Marshall, MI. The CO results are presented in ppm corrected to 15 percent O<sub>2</sub>. The catalyst on the Generator was tested to demonstrate compliance with the outlet concentration limit of  $\leq 23$  ppm corrected to 15 percent O<sub>2</sub>, or a 70% or greater reduction of CO emissions as required in NESHAP ZZZZ, 40 CFR, Part 63.

### SUMMARY OF TEST RESULTS

Parameters	CO (ppm @ 15% O <sub>2</sub> )	CO (ppm @ 15% O <sub>2</sub> )	%
<b>Fairbanks Morse 38TDD8</b>	Inlet	Outlet	CO Reduction (%)
<b>EU-ENG-3</b>	207.61	13.74	93.38

## **SECTION 3**

### **SAMPLING AND ANALYTICAL PROCEDURES**

#### **Carbon Monoxide and Oxygen**

Carbon Monoxide (CO) and Oxygen (O<sub>2</sub>) were measured by EPA Methods 10 and 3A. The Diesel Generator was sampled with each test run lasting approximately one hour. A Teflon heated line was used to transfer the sample from the probe to the sampling trailer. At the sampling trailer, the sample was conditioned by a series of refrigeration dryers to remove the moisture from the gas stream. After the refrigeration dryers, the sample was transported through a Teflon line to the analyzers. The flow of the stack gas sample was regulated at a constant rate to minimize drift.

#### **3.3 Calibration Procedure**

At the start of the day, the each monitor was checked for calibration error by introducing zero, low, mid, and high-range EPA Protocol 1 gases to the measurement system at a point upstream of the analyzers. Comprehensive Emission Services, Inc. refers to the calibration error test as the instrument calibration. The gas was injected into the sampling valve located at the inlet of the sampling probe. The bias test was conducted before and after each consecutive test condition by introducing zero and upscale calibration gases for each monitor. The upscale calibration gases used for the each monitors bias tests were the calibration gases which most closely approximates the effluent concentration monitored during the test runs.

**SECTION 4**  
**TEST RESULTS**

Table 2 summarizes the CO emissions and other parameters for the Fairbanks Morse 38TDD8 Dual Fuel Generator (EU-ENG-3). The raw data is presented in appendix B.

Table 2 Test Results May 27, 2015 EU-ENG-3 Fairbanks Morse 38TDD8 Rating: 2774 HP and 2070 kW				
Parameters	Run 1	Run 2	Run 3	Run 4
Start time	09:35 AM	10:47 AM	11:52 AM	01:07 PM
Stop time	10:35 AM	11:47 AM	12:52 PM	02:07 PM
O2( %) Inlet	12.2	12.2	12.2	12.2
O2( %) Outlet	12.1	12.0	12.0	12.0
CO(ppm) Inlet	301.6	304.0	Failed	310.0
CO(ppm @ 15% O2) Inlet	205.46	206.89	calibration	210.49
CO(ppm) CO(ppm) Outlet	21.3	20.2	19.7	20.3
CO(ppm @ 15% O2) Outlet	14.31	13.45	13.10	13.46
CO Reduction (%)	93.03	93.50	NA	93.61
Average output (KW)	2000			
Average output (%)	96.62			
Catalyst Pressure Differential	1.44	1.47	1.66	1.80
Catalyst Inlet Temp (*F)	570.2	587.2	587.9	583.9