FMI

Farabee Mechanical Inc.

Turn-Key Solution to RICE NESHAP Compliance

P.O. Box 1748 • Hickman, NE 68372-1748
Phone (402) 792-2612 • Fax (402) 792-2712
www.farabeemechanical.com

FMI is the leader in RICE NESHAP Compliance.

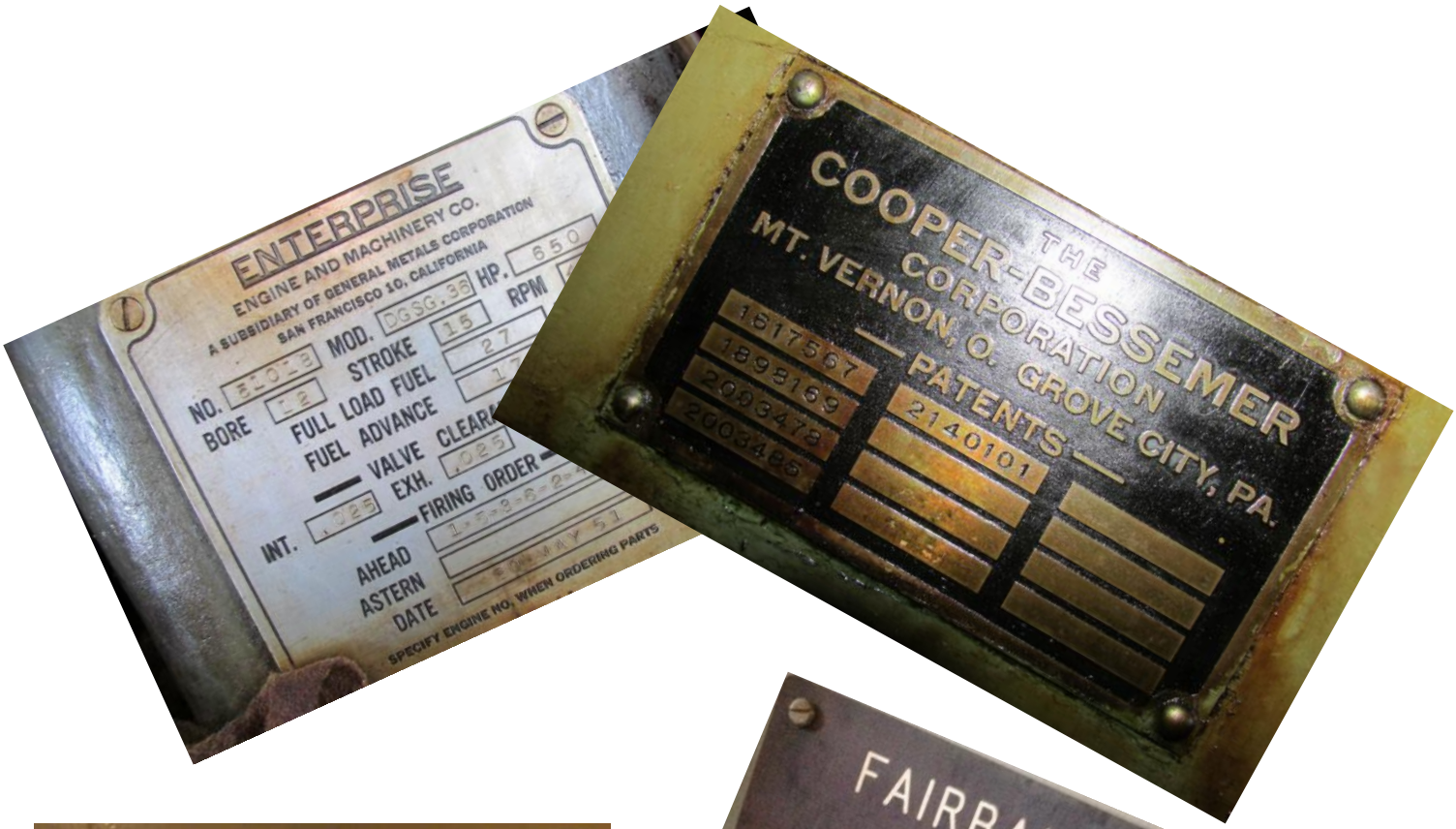
Our experienced team will handle all aspects of the project, including:

- Sizing of the new silencer/catalyst unit
- Sizing of the crankcase vacuum/filter system
- Preparation of all necessary EPA and State regulatory paperwork prior to installation/testing
- Removal of the existing silencer
- Installation of the silencer/catalyst unit
- Installation of the crankcase vacuum/filter system
- Installation of the Continuous Parameter Monitoring System
- Training of plant personnel on operation of Monitoring System
- Preparation of EPA required Site Specific Monitoring Plan Binder
- Independent, third-party emissions testing following installation
- Preparation of all necessary EPA and State regulatory paperwork and reports following testing

All that will be required on your part is a few signatures on key documents

Sizing of the new silencer/catalyst unit & crankcase ventilation/filter system

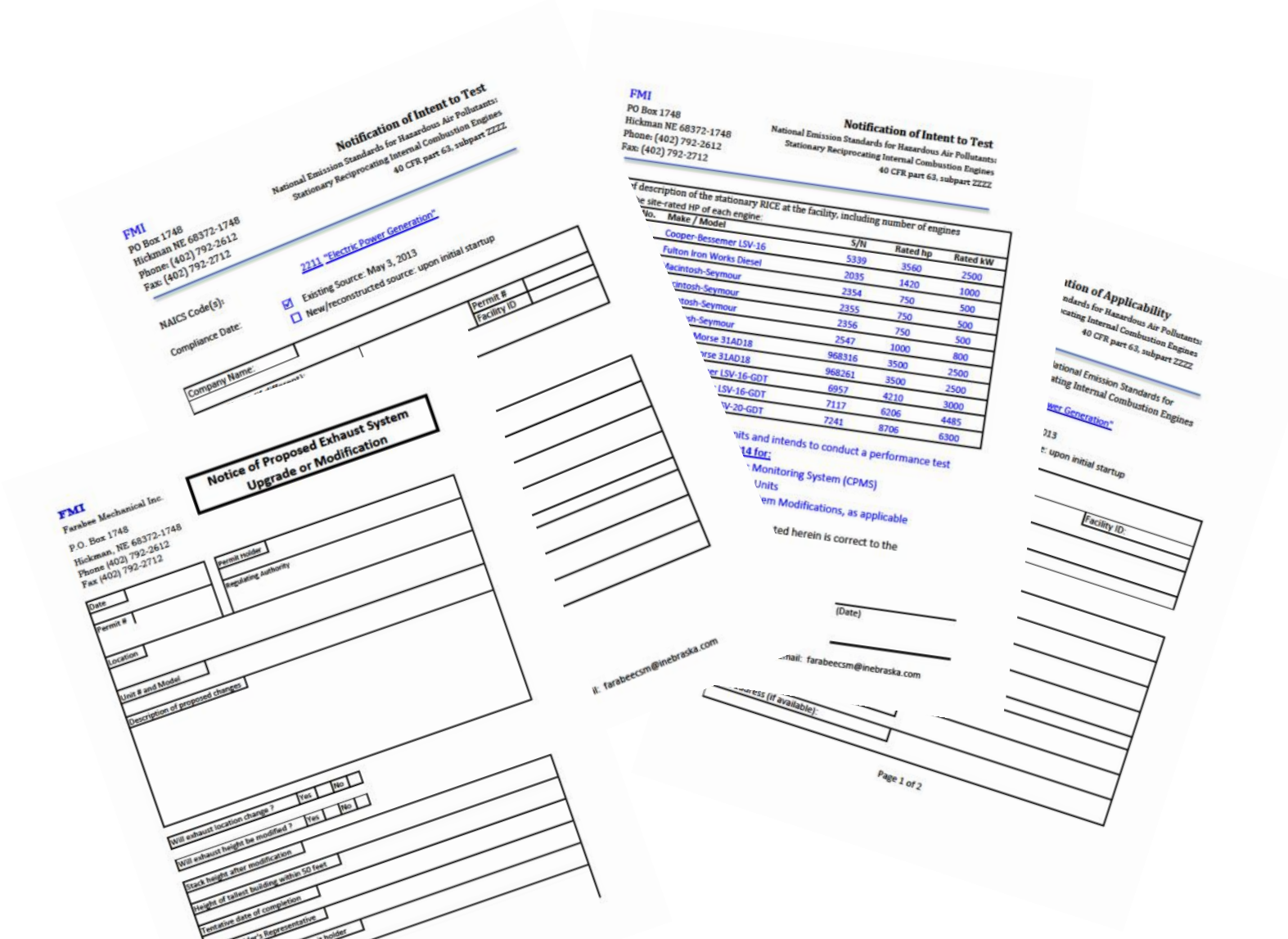
Through site visits and our extensive database of engine specifications, we'll custom design a system that meets EPA requirements. You'll not have to worry about the accuracy of any measurements or calculations - we do it all for you!



Preparation of necessary EPA and State Regulatory paperwork

FMI has been a leader in RICE NESHAP compliance since the implementation of the rule and has worked closely with the different EPA regions and various state agencies to develop and streamline the required modification and pre-test paperwork. You can rest assured that the required documents will be complete, accurate and submitted on-time to the appropriate agencies.

All documents will be submitted for your review and signature prior to submission to keep you apprised of the project's progress.



Removal/Disposal of the existing silencer

Our experienced team will bring all of the necessary knowledge, tools and equipment to remove your existing silencer even from the tightest places as illustrated in the following series of photos:

Removal/Disposal of the existing silencer

Removal/Disposal of the existing silencer

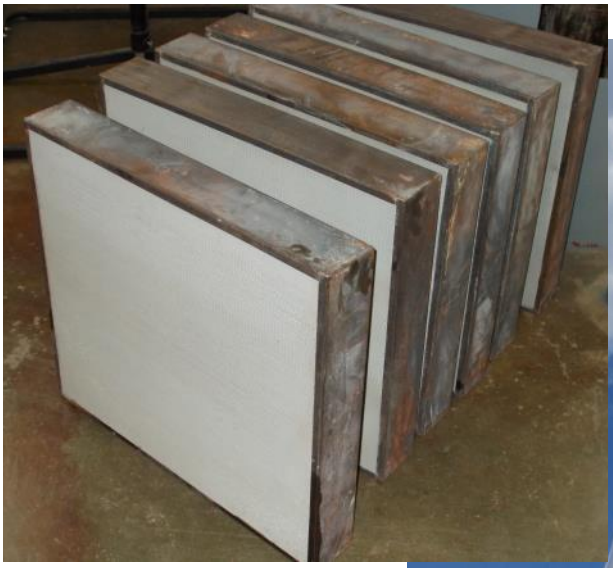
Installation of the silencer/catalyst unit

Once the old silencer has been removed, we'll get to work installing the new silencer/catalyst unit. The first step in the process is installing stand-offs and an aluminum heat shield. Not only does the shield protect plant staff, buildings and other nearby structures from the heat of the exhaust, it also makes the unit more visually appealing. Additionally, the aluminum heat shield reduces requirements for ongoing maintenance such as painting.

Installation of the silencer/catalyst unit

If necessary, we will also remove and replace the silencer foundation before placing the silencer/catalyst unit in place.

Once the unit is connected to the exhaust piping, the catalyst elements and new tailpipe will be installed.



Installation of the crankcase vacuum/filter system

Another important aspect of being RICE NESHAP compliant, is having a crankcase vacuum system installed. This vacuum system prevents unfiltered exhaust from escaping the crankcase and getting into the atmosphere.

If you have a high speed, quick start, straight diesel engine, we'll utilize a RACOR filter system. . These are ingestive crankcase ventilation systems and route filtered crankcase emissions into the intake air stream, where it is re-burned in the combustion process becoming a closed loop system with no net emissions. This type of system does not require electrical power for the crankcase ventilation system modification.

Naturally aspirated Fairbanks Morse OP engines have a self-contained CCV system that meet the requirements of the EPA rule without modification

All other applications, use our custom designed, self-regulating crankcase vacuum system.

Installation of the crankcase vacuum/filter system

FMI's crankcase vent (CCV) system has been designed, tested and field proven to comply with the RICE NESHAP rule regarding crankcase emissions by maintaining a constant vacuum pressure. FMI has installed large numbers of our CCV systems and all have yielded trouble free performance with minimal routine maintenance requirements.

The CCV system has been designed for installation on 500 kW to 10,000 kW Diesel Generators.

FMI has designed an adjustable/self-regulating vacuum regulator. The CCV system utilizes two regulators that can be configured to work on any engine. The vacuum regulators maintain a crankcase vacuum between 1" WC to 2" WC.

Installation of the crankcase vacuum/filter system

A semi-positive displacement crankcase blower, which is appropriately sized to the engine, creates the vacuum necessary to remove the crankcase emissions. The blower is connected to the engine controls and starts automatically with the engine.

The crankcase oil mist reclassifier is a filter assembly designed to capture particulate, metals and oil mist.

3 phase electrical connections for the unit are completed by FMI.

Installation of the crankcase vacuum/filter system

The semi-positive displacement blower pulls a vacuum on the engine crankcase to collect the oil mist and emissions gases for entry into the reclassifier. Inside the reclassifier, the oil mist is separated from the gases and particulates. The oil mist condenses in the bottom of the assembly and is returned to the engine for reuse which reduces engine oil consumption. The filtered, oil free, crankcase gases are then discharged through the plant wall.

Installation of the Continuous Parameter Monitoring System

The next component of FMI's turn-key solution to RICE NESHAP compliance is the installation of a Continuous Parameter Monitoring System. This system continuously monitors the exhaust temperature and the differential pressure (DP) across the catalyst elements while the engine is operating. This information is recorded for later download and inclusion in the Site Specific Monitoring Plan Binder.

The system is composed of: a monitor, a DP transducer, a temperature transmitter and a Type-K thermocouple. The system operates on 120 VAC. The DP transducer and the temperature transmitter send 4-20 mA signals to the monitor for recording. The system has high temperature and high DP alarms. Data is stored in the monitor for easy download via a Compact Flash Card, USB cable or Ethernet connection to the facilities existing data network. The system can also be configured for MODBUS communication.

Installation of the Continuous Parameter Monitoring System

The DP sensing legs are fabricated with of 3/8” .035 304 stainless steel tubing and 304 stainless steel Yor-Loc compression fittings. The sensing lines will be configured to drain back to the silencer to prevent condensation buildup which can cause inaccurate readings.

Data downloaded from the monitor is easily converted into an Excel spreadsheet, complete with graphs, via a simple drag and drop conversion program. Following conversion, the single page containing the Differential Pressure Graph and the Temperature Graph can be easily printed for inclusion in the Site Specific Monitoring Plan Binder. The document also indicates the average Differential Pressure and average Temperature from the recording period.

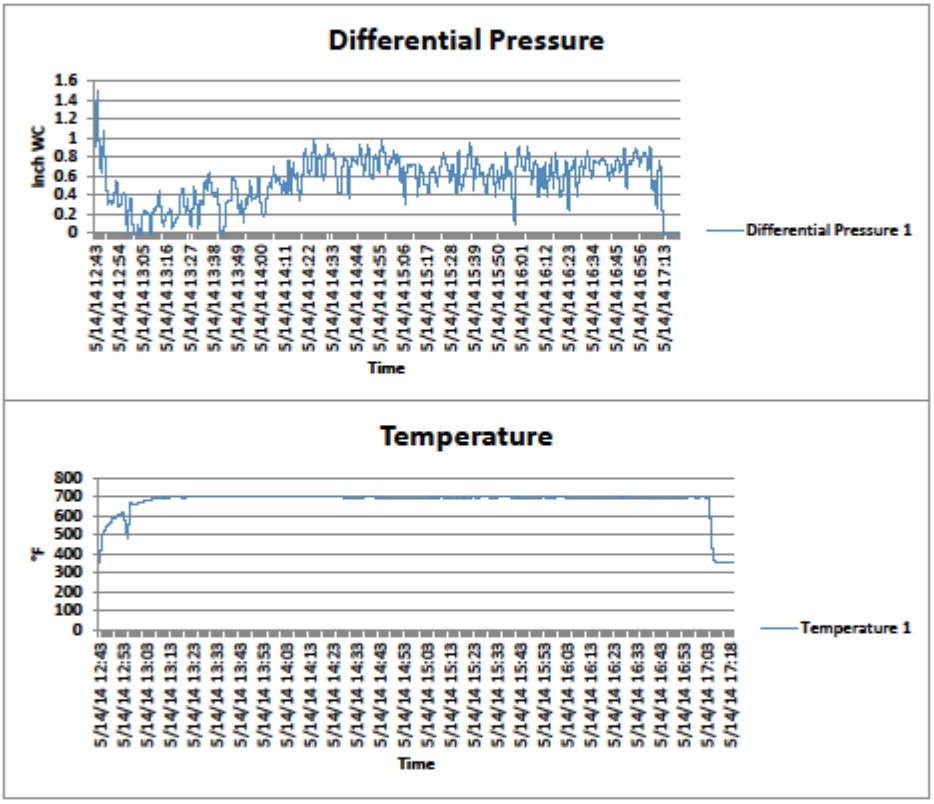
Installation of the Continuous Parameter Monitoring System

These numbers are essential to maintaining emissions compliance. The average Differential Pressure obtained from any recording period cannot deviate more than +/- 2” W.C. of the baseline established during the initial compliance testing. For this reason, the Differential Pressure alarm on the monitor will be set at baseline + 1.5” W.C. to alert operators of a potential problem prior to being out of compliance.

MIRA-MONITOR 2.2 Log Viewer

Unit ID	Unit 5
Unit Name:	McIntosh-Sey sn2356
Logging Session Start Time	5/14/2014 12:43:49 PM

	Maximum	Minimum	Average
Pressure 1	1.5	-0.2	0.5
Temperature 1	703.7	350.4	675.3



Personnel Training

Once all of the components are installed, FMI's service doesn't stop. We take as much time as necessary to train your personnel on the operation of the Monitoring System.

Our training includes:

- Monitor Operation
- Removal & Installation of the Compact Flash Card (as necessary)
- Downloading Data from the Compact Flash Card (as necessary)
- Downloading Data from the Monitor via an Ethernet or USB connection (as necessary)
- Converting that Data into a Graph
- Printing the Graph for inclusion in the Site Specific Monitoring Plan Binder
- How to "zero" the Differential Pressure Transducer

In addition to our time at your facility, assistance is always just a phone call or e-mail away should you ever have any questions about monitor operations.

Preparation of EPA Required Site Specific Monitoring Plan Binder

We take the guesswork out of creating the required Site Specific Monitoring Plan Binder, because at the end of the project, we provide you with a completed binder for each engine that has been brought into compliance

The binder includes:

- The Monitoring Plan which lays out the baselines established during testing
- A section to store the Graphs downloaded from the monitor
- A section containing the manuals for the system components
- A section containing download procedures
- A Maintenance section, detailing required maintenance
- A Requirements section, lists the RICE NESHAP rule as it applies to monitoring
- A Compliance section which contains copies of the signed documents submitted to EPA and the state regulatory authority.
- A Specifications section which provides technical information about the components of the system.

"Yesterday, the Ohio EPA performed a full compliance evaluation of the Oberlin power plant. I wanted to let you know that the OEPA representative was impressed with our site monitoring plans and remarked how the layout was very helpful in completing the evaluation. It appears we are going to get a clean bill of health on our record keeping, reporting and monitoring. I just wanted to thank you for providing us with an excellent and organized plan to keep us in compliance!!!"

-Steve Dupee
City of Oberlin, OH

Independent, third-party emissions testing following installation

Following the catalyst installation, the EPA requires testing to be performed to insure that catalyst panels reduce emissions the required amount. This initial test also sets the baseline for exhaust temperature and differential pressure across the catalyst. The average Differential Pressure obtained from any recording period cannot deviate more than +/- 2" W.C. from the baseline established during the initial compliance testing.

Because this initial test is so important, we hire an independent, third-party test company to complete the emissions test. The company utilizes EPA Methods 10 and 3A to measure carbon monoxide reduction.

Preparation of the necessary EPA and State Regulatory paperwork and reports following testing

The final step in bringing your facility into compliance is to file the test report and associated paperwork with the EPA and State Regulatory Authority. Following completion of testing, we will prepare a report detailing the results of the testing as well as a document to certify compliance with RICE NESHAP regulations.

All that will be required of you is to sign the completed certificate, we take care of everything else.

FMI's turn-key solution makes RICE NESHAP compliance easy!