RECEIVED
MAY 22 2017
AIR QUALITY DIVISION

NSPS Subpart Db
Compliance CEMS Certification
Project Plan

Gas Fired Boilers #12, #13, #14
(432 Boilers)

The Dow Corning Corporation, a subsidiary of
The Dow Chemical Company
Michigan Operations
Midland, Michigan

Sampling Dates: March 21-23, 2017

**** Please note the process unit is the final copy holder and owner of this document. A temporary electronic copy will be retained by test team for a short period of time.***

CEMS CERTIFICATION REPORT

Gas Fired Boilers #12, #13, #14
(432 Boilers)

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiries of those individuals immediately responsible for obtaining the information; I believe the submitted information is true, accurate, and complete.

Chuck Glenn
Dow U.S.A. Texas Operations
Dow Stack Testing Team

Robbie Selbert, P.E.
Dow Performance Silicones
Process Focal Point

Spencer Hurley
Dow U.S.A. Texas Operations
EH&S Delivery

Laura Maiers
Laura Maiers
Dow Performance Silicones
Environmental Focal Point

Michael Abel
Dow U.S.A. Texas Operations
EAC Chemist

1.0 INTRODUCTION

1.1 Summary of Test Program

This report contains the results of the Performance Specification Test for the Continuous Emission Monitoring Systems for NOx and Oxygen that are performed on the 432 Boilers owned and operated by Dow Corning Corporations, a subsidiary of the Dow Chemical Company. This testing was completed as required by NSPS Subpart Db.

The internal stack testing team (AECom Inc) performed relative accuracy (RA) testing. The following table summarizes the pertinent data for this compliance test:

Responsible Groups	• The Dow Corning Corporation, a subsidiary of the Dow Chemical Company • Michigan Department of Environmental Quality (MDEQ) • Environmental Protection Agency (EPA)
Applicable Regulations	• MI-ROP-A4043-2008 • 40 CFR 60 NSPS Subpart Db
Industry / Plant	• 432 Building
Plant Location	• The Dow Corning Company, a subsidiary of the Dow Chemical Company Midland, Michigan 48667
Unit Initial Start-up	• December 2006 Boiler 12 • December 2006 Boiler 13 • December 2006 Boiler 14
Date of Last RATA	• March 22nd and 23rd, 2016
Air Pollution Control Equipment	• Low NOx Burners • Exclusive use of Natural Gas
Emission Points	• Boiler 12 – Vent SV432-001 • Boiler 13 – Vent SV432-002 • Boiler 14 – Vent SV432-003
Pollutants/Diluent Measured	• Nitrogen Oxides (NOx) • Oxygen (O_2)
Test Dates	• Boiler 12 – March 23, 2017 • Boiler 13 – March 21, 2017 • Boiler 14 – March 22, 2017

1.2 Key Personnel

The key personnel who coordinated the test program are:

- Robbie Seibert provided support as a Process Focal Point. The Process Focal Point is responsible for coordinating the plant operation during the test and ensuring the unit was operating at the agreed upon conditions in the test plan. They also serve as the key contact for collecting any process data required and providing all technical support related to process operation.

- Laura Maiers provided support as the Environmental Focal Point for this unit. The Environmental Focal Point is responsible for ensuring that all regulatory requirements and citations are reviewed and considered for the testing. All agency communication will be completed through this role. Contact information is 989-496-5327.

- Chuck Glenn served as the Test Plan Coordinator. The Test Plan Coordinator is responsible for the overall leadership of the sampling program. They also develop the overall testing plan and determine the correct sample methods.

- Spencer Hurley was the back-up for the Test Plan Coordinator. He also served as the technical review role of the test data.

- Michael Abel provided support as a technical review of the test data.

- Dan Bennett served as the Sample Team Leader. The sample Team Leader is responsible for ensuring the data generated meets the quality assurance objectives of the plan. Kyle Kennedy assisted as a sampling technician for this testing.

2.0 PLANT AND SAMPLING LOCATION DESCRIPTION

2.1 Facility Description

432 Building is used to provide steam to chemical manufacturing plants located in the Dow Corning Midland Site, which includes three natural gas boilers and all required ancillary equipment. Boiler feed water is imported from existing site infrastructure. Natural gas (High Pressure Fuel Gas, HPFG) provide fuel for these three boilers. Steam produced in the auxiliary boilers will be sent throughout the Dow Corning Midland site at 150 psig.

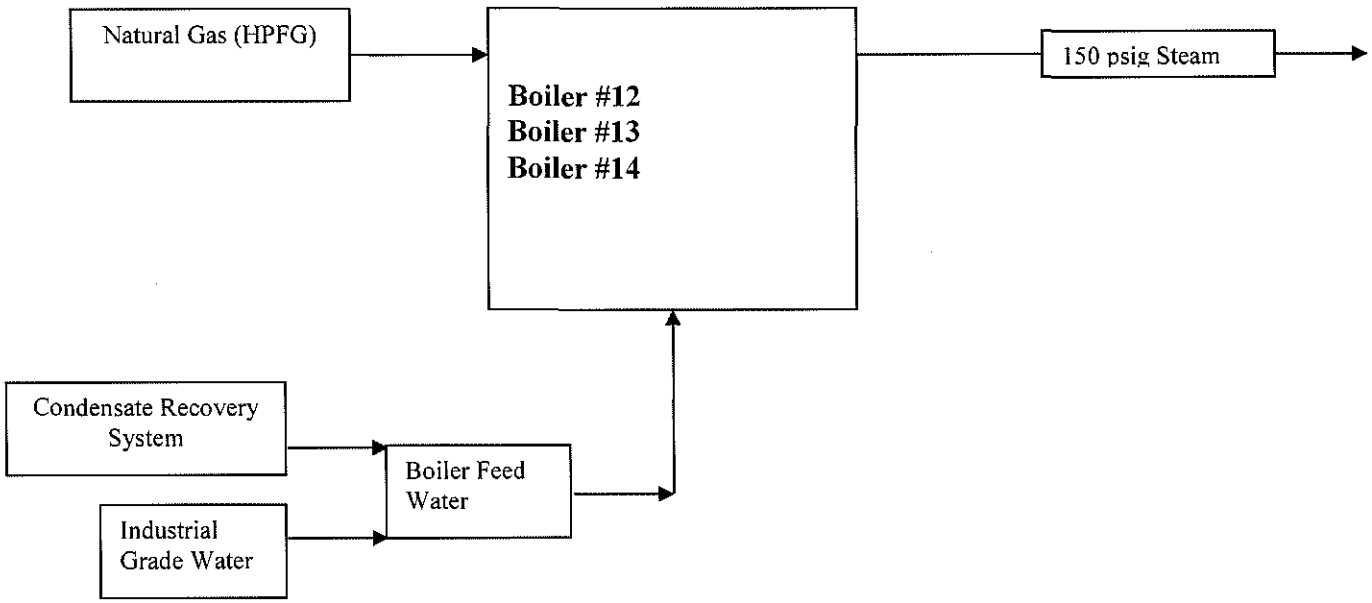
2.2 Control Equipment Descriptions

The boilers utilize a low NOx burner design with O2 trim to reduce the stack NOx concentration.

2.3 Flue Gas Sampling Locations

Emission sampling will be conducted from each boiler stack. Each stack has sampling ports installed at a height which complies with the requirements of 40 CFR 60, Appendix A, Reference Method 1. The sample locations are a minimum of two diameters upstream of gas flow disturbances.

FIGURE 2.1: FACILITY DIAGRAM



3.0 SUMMARY AND DISCUSSION OF TEST RESULTS

3.1 Objectives and Test Matrix

The purpose of these Performance Specification Tests is to demonstrate compliance with the CEMS testing requirements. This testing was completed as required by NSPS Subpart Db. The specific objectives of this test were:

- Measure the NOx emissions from the boiler stacks
- Determine the O_2 concentration from the boiler stacks

Table 3.1 presents a summary for the results for the Performance Specification Test for CEMS RATA.

3.2 Facility Operations

- During the CEMS test, the plant was operated at greater than 50% of normal operating rates.

3.3 Comments/Exceptions

- This Performance Specification Test for the boiler stacks consisted of up to 12 total 21-minute runs. A maximum of three runs were not used for RATA calculations as allowed by 40 CFR Part 60, PS 2 and 3.

Summary of Results
Boiler 12, Vent SV432-001
Continuous Emission Monitor Certification
Test Period: from: March 23, 2017

NOx Monitoring

Test Type	NOx Monitor Results lb/mmBtu	Allowable	Pass/Fail Semi/Annual
Relative Accuracy	3 %	20% RA using RM or 10% RA using EL	Pass
	1 %		Pass
			Pass

***Emission limit is 0.10 NOx lb/MMBtu based on instantaneous value found in NSPS Subpart Db.**

O2 Monitoring

Test Type	O2 Monitor Results	Allowable	Pass/Fail Semi/Annual
Relative Accuracy	0 %	No greater than 20% of mean value of RM or the absolute difference between RM and CEMS <= 1.0%	Pass
	0.0 %		Pass
			Pass

Summary of Results
Boiler 13, Vent SV432-002
Continuous Emission Monitor Certification
Test Period: from: March 21, 2017

NOx Monitoring

Test Type	NOx Monitor Results lb/mmBtu	Allowable	Pass/Fail Semi/Annual
Relative Accuracy	25 %	20% RA using RM or 10% RA using EL	Used Alternative
	6 %		Pass
			Pass

***Emission limit is 0.10 NOx lb/MMBtu based on instantaneous value found in NSPS Subpart Db.**

O2 Monitoring

Test Type	O2 Monitor Results	Allowable	Pass/Fail Semi/Annual
Relative Accuracy	4 %	No greater than 20% of mean value of RM or the absolute difference between RM and CEMS <= 1.0%	Pass
	0.2 %		Pass
			Pass

Summary of Results
Boiler 14, Vent SV432-003
Continuous Emission Monitor Certification
Test Period: from: March 22, 2017

NOx Monitoring

Test Type	NOx Monitor Results lb/mmBtu	Allowable	Pass/Fail Semi/Annual
Relative Accuracy	19 %	20% RA using RM or 10% RA using EL	Pass
	7 %		Pass
			Pass

***Emission limit is 0.10 NOx lb/MMBtu based on instantaneous value found in NSPS Subpart Db.**

O2 Monitoring

Test Type	O2 Monitor Results	Allowable	Pass/Fail Semi/Annual
Relative Accuracy	3 %	No greater than 20% of mean value of RM or the absolute difference between RM and CEMS <= 1.0%	Pass
	0.2 %		Pass
			Pass

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 Test Methods

The relative accuracies of Dow's CEMS determined by comparison to EPA methods for measurement of each component gas. The performance specifications (PS) required the use of the following methods:

- PS 2 – Method 7E for NOx; and
- PS 3 – Method 3A for O2.

4.2 Procedures

The above methods were performed using mobile continuous emission monitors. Gases were withdrawn from the stack and transported to monitors located at ground level. A stainless-steel probe was inserted into the stack and used to collect sample gas. A Teflon sample line heated to 250°F transported sample gas from the probe to the analyzers. The analyzers were kept at a constant temperature inside the mobile laboratory.

Sample gas was collected continuously from the stack for a period of 21 minutes per run at the three traverse points of 16.7%, 50% and 83.3% of the measurement line that passes through the centroidal area of the stack or duct cross section. At the mobile laboratory, the stack gas was routed to a condenser and then transported to the analyzers for analysis.

The Relative Accuracy Tests were conducted by comparison of the CEMS response to a value measured by a Performance Test Method (PTM) which, in this case, was Method 7E for Nitrogen Oxides, Method 10 for Carbon Monoxide and Method 3A for O_2.

EPA Method 3A (Gas Analysis for the Determination of Dry Molecular Weight)

EPA Method 3A (Instrumental Method) was utilized to determine the diluent during each run on the outlet.

An analyzer measured O_2 content on the basis of the strong paramagnetic properties of O_2 relative to other compounds present in combustion gases. In the presence of a magnetic field, O_2 molecules become temporary magnets. The analyzer determines the sample gas O_2 concentration by detecting the displacement torque of the sample test body in the presence of a magnetic field.

EPA Method 7E (Determination of Nitrogen Oxides)
EPA Method 7E was utilized to determine nitrogen oxide concentrations during each run on the outlet.

A NOx analyzer was used to monitor the concentration of NOx during each run. A sample of the effluent gas was continuously sampled and conveyed to an analyzer for measuring the concentration of NOx. The gas stream was directed through a NO_2 convertor to convert NO_2 to NO concentration. The analyzer yielded results of a total result of NOx.

4.3 List of Sampling Equipment

Stack Reference Instruments

REFERENCE METHOD	EQUIPMENT	ID #	RANGE	SPAN
Method 3A (O_2)	Teledyne Paramagnetic Analyzer	(S/N:376)	25 %	19.7 %
Method 7E (NO_x)	CAI Chemuliscience Analyzer	(S/N: 6L09006)	1000 ppm	31.0 ppm

Process CEMS Instruments
Boiler 12 (Completed on Dry Basis)

Constituent	Unit	Manuf.	Model	Serial #	Span
Nitrogen Oxides	ppmv	Thermo	42I	0630619176	0-500
Oxygen	vol %	Brand Gaus	4705	10478	0-25

Boiler 13 (Completed on Dry Basis)

Constituent	Unit	Manuf.	Model	Serial #	Span
Nitrogen Oxides	ppmv	Thermo	42I	0630619177	0-500
Oxygen	vol %	Brand Gaus	4705	10556	0-25

Boiler 14 (Completed on Dry Basis)

Constituent	Unit	Manuf.	Model	Serial #	Span
Nitrogen Oxides	ppmv	Thermo	42I	0630619175	0-500
Oxygen	vol %	Brand Gaus	4705	10555	0-25

FIGURE 4.1: SAMPLING TRAIN USED FOR NOx & O_2 (M7E & M3A)