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APR 04 2016

AIR QUALITY DIV.



FCA US LLC
Jefferson North Assembly Plant
Detroit, Michigan

Final Report

EUBOILER1 Compliance Air Emissions Report for Nitrogen Oxides and Carbon Monoxide

RWDI # 1600520
March 31, 2016

SUBMITTED TO

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MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

**RENEWABLE OPERATING PERMIT
REPORT CERTIFICATION**

Authorized by 1994 P.A. 451, as amended. Failure to provide this information may result in civil and/or criminal penalties.

Reports submitted pursuant to R 336.1213 (Rule 213), subrules (3)(c) and/or (4)(c), of Michigan's Renewable Operating Permit (ROP) program must be certified by a responsible official. Additional information regarding the reports and documentation listed below must be kept on file for at least 5 years, as specified in Rule 213(3)(b)(ii), and be made available to the Department of Environmental Quality, Air Quality Division upon request.

Source Name FCA US LLC - Jefferson North Assembly Plant County Wayne
 Source Address 2101 Connor Ave City Detroit
 AQD Source ID (SRN) N2155 ROP No. MI-ROP-N2155- ROP Section No. _____
2010

Please check the appropriate box(es):

Annual Compliance Certification (Pursuant to Rule 213(4)(c))

Reporting period (provide inclusive dates): From _____ To _____

1. During the entire reporting period, this source was in compliance with **ALL** terms and conditions contained in the ROP, each term and condition of which is identified and included by this reference. The method(s) used to determine compliance is/are the method(s) specified in the ROP.

2. During the entire reporting period this source was in compliance with all terms and conditions contained in the ROP, each term and condition of which is identified and included by this reference, **EXCEPT** for the deviations identified on the enclosed deviation report(s). The method used to determine compliance for each term and condition is the method specified in the ROP, unless otherwise indicated and described on the enclosed deviation report(s).

Semi-Annual (or More Frequent) Report Certification (Pursuant to Rule 213(3)(c))

Reporting period (provide inclusive dates): From _____ To _____

1. During the entire reporting period, **ALL** monitoring and associated recordkeeping requirements in the ROP were met and no deviations from these requirements or any other terms or conditions occurred.

2. During the entire reporting period, all monitoring and associated recordkeeping requirements in the ROP were met and no deviations from these requirements or any other terms or conditions occurred, **EXCEPT** for the deviations identified on the enclosed deviation report(s).

Other Report Certification

Reporting period (provide inclusive dates): From NA To NA

Additional monitoring reports or other applicable documents required by the ROP are attached as described:
Final Report for Source Testing on EUBOILER 1. Report dated March 2016

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this report and the supporting enclosures are true, accurate and complete

Tony Hill Sr. Manufacturing Manager 313-910-1278
 Name of Responsible Official (print or type) Title Phone Number

 Signature of Responsible Official Date
Anthony C. Hill 3.31.2016

* Photocopy this form as needed.

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CONSULTING ENGINEERS
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Source Testing Program EUBOILER1
RWDI #1600520
March 31, 2016

EXECUTIVE SUMMARY

RWDI AIR Inc. (RWDI) was retained by FCA US LLC (FCA) to complete a compliance level air sampling program on a gas fired boiler identified as EUBOILER1 at their Jefferson North Assembly Plant (JNAP) located in Detroit, Michigan. The purpose of this testing was to evaluate compliance with Nitrogen Oxides (NOx) and Carbon Monoxide (CO) emission limits specified by Renewable Operating Permit MI-ROP-N2155-2010. The testing followed United States Environmental Protection Agency (USEPA) Test Methods 7E and 10.

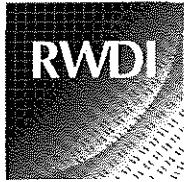
Testing consisted of three (3) 60-minute test runs for nitrogen oxide and carbon monoxide emissions. The sampling was conducted on February 2nd, 2016. Sampling was witnessed by Mr. Mark Dziadosz and Mr. Bob Byrnes from the Southeast Michigan Air Quality Division of the State of Michigan Department of Environmental Quality.

Results of the sampling program are outlined in the table below. Results of individual tests are presented in the Appendices.

Table 1: EUBOILER 1 Nitrogen Oxide and Carbon Monoxide Emissions

Parameter	Run 1		Run 2		Run 3		Average	
	lb/MM Btu	lb/hr	lb/MM Btu	lb/hr	lb/MM Btu	lb/hr	lb/MM Btu	lb/hr
Nitrogen Oxides	0.105	4.7	0.098	4.6	0.105	4.8	0.103	4.7
Carbon Monoxide	0.0032	0.14	0.0017	0.08	0.0018	0.08	0.0022	0.10

lb/MM Btu: pound per million British thermal unit
lb/hr: pound per hour



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FCA US LLC – Jefferson North Assembly Plant (JNAP)
Source Testing Program EUBOILER1
RWDI #1600520
March 31, 2016

1. INTRODUCTION

RWDI AIR Inc. (RWDI) was retained by FCA US LLC (FCA) to complete a compliance level air sampling program on a gas fired boiler identified as EUBOILER1 at their Jefferson North Assembly Plant (JNAP) located in Detroit, Michigan. The purpose of this testing was to evaluate compliance with Nitrogen Oxides (NOx) and Carbon Monoxide (CO) emission limits specified by Renewable Operating Permit MI-ROP-N2155-2010. The testing followed United states Environmental Protection Agency (USEPA) Test Methods 7E and 10.

Testing consisted of three (3) 60-minute test runs for nitrogen oxide and carbon monoxide emissions. The sampling was conducted on February 2nd, 2016. Sampling was witnessed by Mr. Mark Dziadosz and Mr. Bob Byrnes from the Southeast Michigan Air Quality Division of the State of Michigan Department of Environmental Quality.

The notification of intent to conduct the air compliance testing was submitted to the Michigan Department of Environmental Quality on October 29th, 2015. The quality assurance review of the test plan was completed on January 14th, 2016. Both the notification of intent letter and the quality assurance review letter as well as a copy of the Renewable Operating Permit (RNOP) is located in **Appendix A** of this report. Below is a table that summarizes test dates for each parameter tested.

Table 2: Source, Parameter and Test Date

Source	Parameter	Test Date
EUBOILER1	Nitrogen oxides and Carbon Monoxide	February 2, 2016

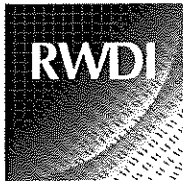
2. SOURCE DESCRIPTION

2.1 Facility Description

JNAP is located at 2101 Connor Avenue in Detroit, Michigan. JNAP facility is an automobile assembly plant where vehicles are prepped, painted and assembled. The Dodge Durango and Jeep Grand Cherokee were the production vehicles at the JNAP during testing. The boiler tested generates hot water for plant use. The boiler utilizes natural gas for fuel. A description of the boiler and the pollution control is presented below. The maximum capacity varies from 50-70% of full capacity.

Table 3: Boiler Description

Boiler	Pollution Control Equipment
EUBOILER1	Low NO _x Boilers and Flue Gas Recirculation



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FCA US LLC – Jefferson North Assembly Plant (JNAP)
Source Testing Program EUBOILER1
RWDI #1600520
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3. SAMPLE LOCATION

The sampling location was located inside the power house on the second level. A stratification test was performed and the flue gas at this location was determined to be uniform or un-stratified.

4. SAMPLING METHODOLOGY

4.1 Testing Methodology

The following table summarizes the test methodologies that were followed during this program.

Table 4: Summary of Test Methodology

Parameter	Proposed Method
Temperature, Flow Rate and Moisture	USEPA ^[1] Method 1-4
Oxides of Nitrogen (NOx)	USEPA ^[1] Method 7E (CEM)
Carbon Monoxide	USEPA ^[1] Method 10 (CEM)

Notes: [1] USEPA = United States Environmental Protection Agency

4.2 Description of Testing Methodology

The following section provides brief descriptions of the sampling methods.

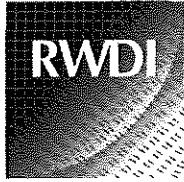
4.2.1 USEPA Method 1-4

The exhaust velocities and flow rates were determined following the United States Environmental Protection Agency (USEPA) Method 2, "Determination of Stack Gas Velocity and Flow Rate (Type S Pitot Tube)". Velocity measurements were taken with a pre-calibrated S-Type pitot tube and incline manometer. Velocity and sampling points for a traverse were determined from USEPA Method 1, "Sample and Velocity Traverses for Stationary Sources". Volumetric flow rates were determined following the equal area method as outlined in USEPA Method 2. Temperature measurements were made simultaneously with the velocity measurements and conducted using a chromel-alumel type "k" thermocouple in conjunction with a digital temperature indicator.

The dry molecular weight of the stack gas was determined following calculations outlined in USEPA Method 3, "Gas Analysis for the Determination of Dry Molecular Weight". Stack moisture content was determined through direct condensation and according to USEPA Method 4, "Determination of Moisture Content in Stack Gases". Detailed flow and moisture information is located in **Appendix D**.

4.2.2 USEPA Method 10

USEPA Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources (Instrument Analyzer Procedure)", was used to measure the carbon monoxide concentration of the flue gas. The exhaust gas sample was withdrawn from a single point at the centre of the duct/stack using a stainless steel probe. The sample proceeded through a heated filter where particulate matter was removed. The sample was then transferred via a heated Teflon® line and introduced to the analyzers (hot/wet) for measurement. A Rosemount Model NGA2000 Non-Dispersive Infrared Analyser (NDIR) was used for oxygen measurements. A schematic of the sampling system apparatus is located in **Appendix B**.



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Prior to testing, a 3-point analyzer calibration error check was conducted using USEPA protocol gases. The calibration error check was performed by introducing zero, mid and high level calibration gases directly into the analyzer. The calibration error check was performed to confirm that the analyzer response was within $\pm 2\%$ of the certified calibration gas introduced. Prior to each test run, a system-bias test was performed where known concentrations of calibration gases were introduced at the probe tip to measure if the analyzers response was within $\pm 5\%$ of the introduced calibration gas concentrations. At the conclusion of each test run a system-bias check was performed to evaluate the percent drift from pre and post-test system bias checks. The system bias checks confirmed that the analyzer did not drift greater than $\pm 3\%$ throughout a test run.

Data acquisition was provided using a data logger system programmed to collect and record data at one second intervals. Average one minute concentrations were calculated from the one second measurements.

Appendix C contains detailed data for CO and NO_x emissions, including summary of results and 1 minute averages for EUBOILER1. Calibration error check and system bias check information is located in **Appendix E** with calibration gas Certificates of Accuracy located in **Appendix F**

4.2.3 USEPA Method 7E

NO_x emissions were measured following USEPA Method 7E, "Determination of Nitrogen Oxides Emissions from Stationary Sources." The NO_x concentration was measured using a Teledyne Chemiluminescence gas analyzer. The exhaust gas sample was withdrawn from a single point at the centre of the duct/stack using a stainless steel probe. The sample proceeded through a heated filter where particulate matter was removed. The sample was then transferred via a heated Teflon® line and introduced to the analyzers (hot/wet) for measurement.

Prior to testing, a 3-point stratification test was conducted at 16.7, 50 and 83.3 percent of the stack diameter for at least twice the response time as outlined in the method. The NO_x concentration was measured to be uniform in the stack cross section and was less than $\pm 5\%$ or 0.5ppm of the mean concentration for all three traverse points. The gas stream was considered to be unstratified and a single sampling point, located at the centroid of the stack was used for sampling. Stratification information is included in **Appendix E**.

A NO/NO₂ conversion check was performed prior to the start of the sampling by introducing NO₂ gas into the NO_x analyzer. The analyzers NO_x concentration readout was greater than 90% of the introduced calibration gas; therefore the conversion met the converter efficiency requirement of section 13.5 of USEPA Method 7E. NO/NO₂ conversion data is located in **Appendix E**.

Calibration error and system-bias checks were performed as described in section 4.2.2.



5. PROCESS DATA

JNAP representatives provided production information during testing of the boilers including load capacity (%) and natural gas usage per test (ft³/hr). Below is a table showing steam load and gas usage during testing.

Table 5: Process Data

Source		Run 1	Run 2	Run 3	Average
EUBOILER1	Date	2-Feb-16	2-Feb-16	2-Feb-16	--
	Time	7:14 to 8:14	8:26 to 9:26	9:35 to 10:35	--
	Natural Gas (ft ³ /hr)	43,600	45,800	43,901	44,434
	Boiler Load (%)	50%	50%	50%	50%
	Gross Calorie Value	1034 btu/ft ³ (provided by DTE)			

Note: The gross calorie value of the fuel used during testing was 1034 Btu/ft³

Prior to commencing the testing, Mr. Patel and/or the Boiler Operators confirmed that the process was operating normally and load was within 50-70% of full capacity.

6. RESULTS

The average emission results for this study are presented in the table below. Detailed information regarding each test run can be found in **Appendix C**.

Table 1: EUBOILER 1 Nitrogen Oxide and Carbon Monoxide Emissions

Parameter	Run 1		Run 2		Run 3		Average	
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Carbon Monoxide	0.0032	0.14	0.0017	0.08	0.0018	0.08	0.0022	0.10

lb/MM Btu: pound per million British thermal unit
 lb/hr: pound per hour

7. CONCLUSIONS

Testing was successfully completed on February 2nd, 2016. All parameters were tested in accordance with USEPA referenced methodologies. Field notes from the testing program can be found in **Appendix G** and sample calculations are presented in **Appendix H**.