



Ford Motor Company
Vehicle Operations

Dearborn Truck Plant
3001 Miller Road
PO Box 1659
Dearborn, Michigan 48121

Mr. Robert Byrnes
Michigan Department of Environmental Quality
Air Quality Division
3056 West Grand Blvd., Suite 2-300
Detroit, MI 48202

April 21, 2016

Dear Mr. Byrnes,

On March 31, 2016, the Michigan Department of Environmental Quality (MDEQ) issued a Violation Notice to the Dearborn Truck Plant based on their review of the facility's 2015 Semi-Annual and Annual ROP Certifications. The notice cited rule/permit condition violations related to the Guidecoat Emissions Unit (Rule 336.1702; 336.1910, 40 CFR Part 64, Permit Conditions EU-Guidecoat IV.1 and FG-Controls IX.1) as well as the Controls Flexible Group (40 CFR Part 64.7 (d), Permit Condition FG-Controls VI.6). As requested by the MDEQ, below is Ford's response to the Violation Notice.

Operation of the Fresh Air Damper

The fresh air damper is used to allow fresh air into the duct leading to the Prime Abatement Adsorber during startup, cleaning and maintenance activities. During cleaning or maintenance periods, the atmospheric valves and fresh air damper are opened, the isolation valves are closed, and prime abatement ceases as all air is directed to atmosphere (see Figure 1) (Cleaning Mode). During production periods, abatement is restarted, isolation valves are opened, and the fresh air damper and atmospheric valves are then closed directing emissions from the Prime booth to the abatement system (Production Mode). When the fresh air damper does not open or close properly, this fault causes the abatement equipment to cease operation.

As discussed below, during the July 25, 2015 to November 11, 2015 production period the system operated in Production Mode. On November 11, 2015 a sudden booth balance upset caused the engineers to investigate the source of the upset. Upon investigation they found that the proximity switch indicated that the fresh air damper was in the closed position although a physical inspection of the fresh air damper showed it to be open. Since air would be preferentially pulled from the fresh air damper due to the negative static pressure in the duct, it caused the booth upset. A subsequent investigation found that the internal bearings had seized not allowing the negative static pressure in the duct to naturally pull the damper blades closed.

The thermal oxidizer associated with this damper is designed to operate without natural gas in Production Mode, and instead uses VOCs in the inlet air to maintain combustion temperature. If the fresh air damper actually was in Cleaning Mode during the entire time period of July 25, 2015 to

November 11, 2015, there would have been insufficient VOC's for the thermal oxidizer to maintain proper combustion temperature unless natural gas also was used for combustion. Throughout this time period, however, our data indicates that during normal production natural gas was not being used by the system, and yet proper combustion temperature was still maintained. For reference, please see Figures 2a-2c showing that proper temperature was maintained during two separate weeks that are representative of production during this time period, as well as one week representing current operations. Therefore, Ford does not believe there was any impact on control efficiency of the prime abatement system during this time period. As you know, due to the large amount of data necessary to fully evaluate this issue, we only selected three weeks of data, but upon request we can provide the data for the entire time period.

Deviations

During the period of July 25, 2015 thru February 21, 2016, there were multiple bypasses of the prime abatement system due to the malfunction of the fresh air damper. With each concern, the plant implemented corrective actions as summarized in Table I to return the damper to proper operation. As a preventive action, the system was reprogrammed on February 21, 2016 so that the fresh air damper remains closed during cleaning (similar to Production Mode, allowing for abatement) unless the Prime booth is taken completely off-line. In addition, the fresh air damper assembly was completely replaced on February 28, 2016. The facility has experienced no other concerns since the replacement was completed.

Root Cause

The prime abatement system installed at DTP consists of a fluidized bed adsorber and packed bed desorber which utilizes beaded activated carbon (BAC) media to capture and control VOCs from the truck painting operations. This BAC system, and the corresponding ductwork and damper configuration, is unique to DTP -- it is the only BAC system used for compliance purposes within Ford Motor Company. Upon replacement of the fresh air damper, it was discovered that the damper assembly had concealed bearings, as opposed to sealed bearings that are normally specified by Ford for emission abatement equipment. Concealed bearings require periodic greasing however this requirement was not clearly captured within the Plant's preventive maintenance process as it was not disclosed from the manufacturer at the time of purchase and installation. We believe a lack of grease potentially caused the fresh air damper to operate improperly. The new damper is equipped with sealed bearings, so this will not be an issue with this particular damper going forward. DTP will review all air emission abatement equipment dampers to ensure that bearing lubrication requirements are addressed by routine preventive maintenance actions.

Ford believes that all violations cited in the March 31st notice have been properly addressed, however if there are any other questions/concerns, please contact Tamberlyn Shell at (313) 805-5374 or Mike Larson at (313) 845-2691 at your earliest convenience.

Sincerely,

A handwritten signature in black ink, appearing to read "Bradford Huff".

Bradford Huff

Ford Dearborn Truck Plant
Plant Manager

cc/via email:

Ms. Wilhemina McLemore, DEQ

Mr. Glen Logan, Ford EQO

Ms. Lisa Hansen, Ford EQO

Mr. Timothy Green, Ford OGC

Attachments

Table I. Dearborn Truck Plant Fresh Air Damper Deviations

Dates	Duration (min)	Cause	Actions Taken
7/25/2015	80	Prime abatement went offline due to the fresh air damper linkage failure. Identified a bent shaft putting stress on linkage, causing it to break.	The damper was opened manually and the linkage was repaired.
11/11/2015	-	Plant experienced airflow issues in the prime booth. Investigation discovered the fresh air damper in the open position due to broken linkage welds. The control room panel erroneously indicated the fresh air damper was closed.	The linkage was repaired.
11/12/2015	31	Prime abatement went offline due to the fresh air damper linkage issue.	Performed an emergency stop to shorten the sequence of shutdown time. System start sequence process started.
11/16/2015	43	Prime abatement went offline due to fresh air damper linkage issue. Stress on the linkage caused the shaft to fail.	Outside vendors were called in to investigate and make repairs to the linkage
11/17/2015	57	Prime abatement went offline due to the fresh air damper linkage issue. Repairs made by contractor not robust enough to prevent linkage stress.	Linkage was repaired but outside vendor was contacted to schedule additional work.
11/22/2015	90	Contractor working on modifying the fresh air damper actuator, left metal shavings on the magnetic position switch. This caused readings on the position of the fresh air damper that caused a fault that shutdown the abatement system.	The issue was identified and metal shavings were removed.
11/23/2015	108	Prime abatement went offline due to adsorber fluidized carbon flow issues. The carbon flow characteristics were altered due to moisture accumulation associated with equipment downtime on 1/22.	Transferred carbon to adjust levels and adjusted flow rate.
11/26/2015	147	Damper failed to close and open properly when switching between operating and cleaning mode, causing a shutdown due to fresh air damper fault. During restart, the sequence restart logic experienced a hang up, delaying restart.	Startup logic reviewed by vendor but no issues detected.
11/27/2015	247	Damper failed to close and open properly when switching between operating and cleaning mode, causing a shutdown due to fresh air damper fault. During restart, the sequence restart logic experienced a hang up, delaying restart.	The prox switch was adjusted on 1/29.
1/7/2016	31	Damper failed to close and open properly when switching between operating and cleaning mode, causing a shutdown due to fresh air damper fault.	System restarted and put back on-line.
1/30/2016	235	Damper failed to close and open properly when switching between operating and cleaning mode, causing a shutdown due to fresh air damper fault. Shaft was found to be broken.	Lubed the damper bearings. Rewelded the shaft and adjusted the prox flag.
2/1/2016	221	A booth air supply house failed, requiring the fresh air damper to open. The fresh air damper failed to open, causing a shutdown. During restart, the sequence restart logic experienced a hang up, delaying restart.	System put back on-line.

Table I. Dearborn Truck Plant Fresh Air Damper Deviations

2/8/2016	38	Fresh air damper being operated manually. Operator error in coordinating the manual process when switching between operating and cleaning mode caused a shutdown due to fresh air damper fault.	Software updated 2/21/16 to keep booth on line to the prime abatement during both production and maintenance modes. Damper was replaced on 2/28/16.
2/11/2016	37		
2/19/2016	15		
2/20/2016	25		

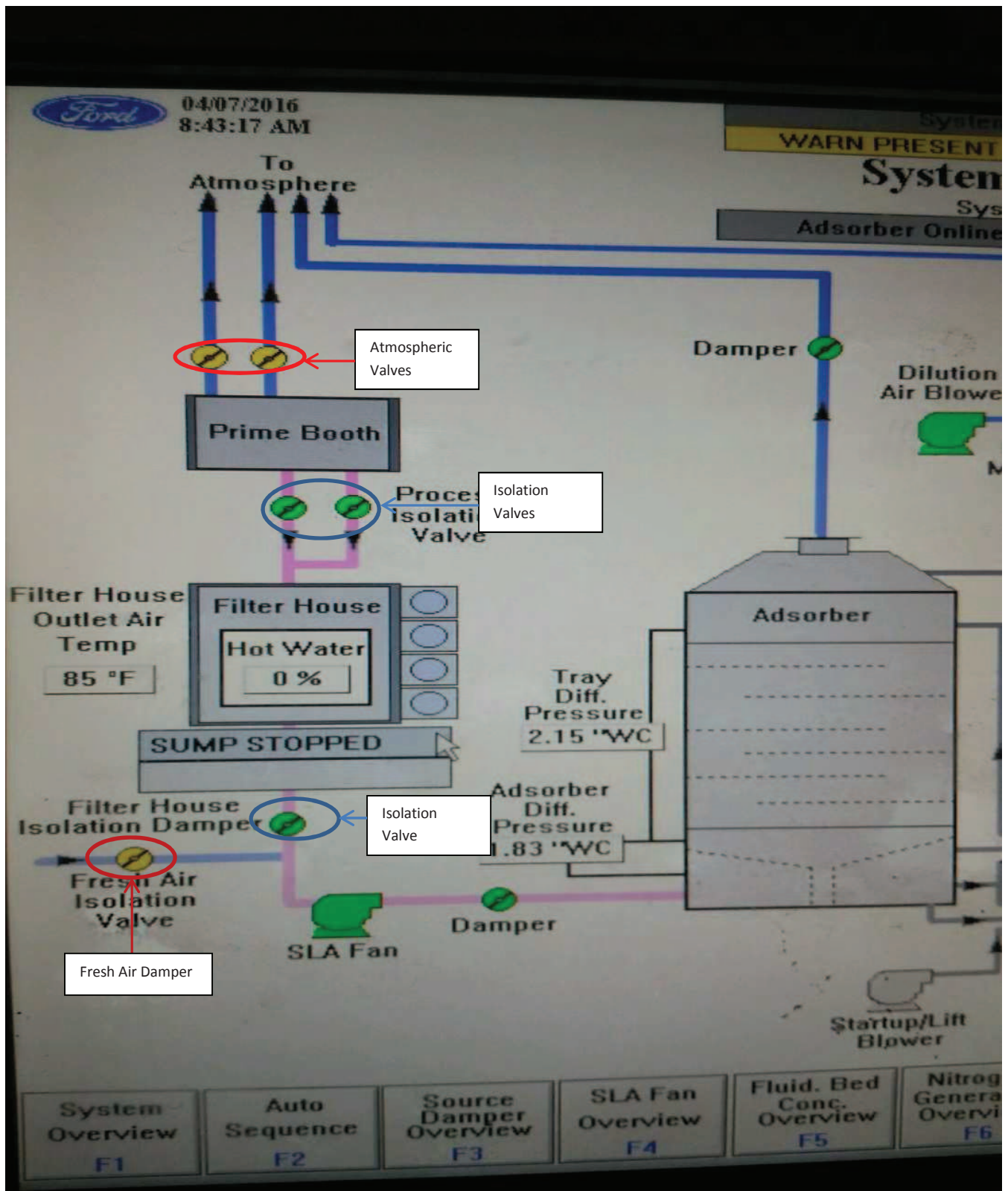


Figure 1. Prime Abatement System Schematic

Figure 2a. Prime Abatement (7/25/15 - 7/31/15)

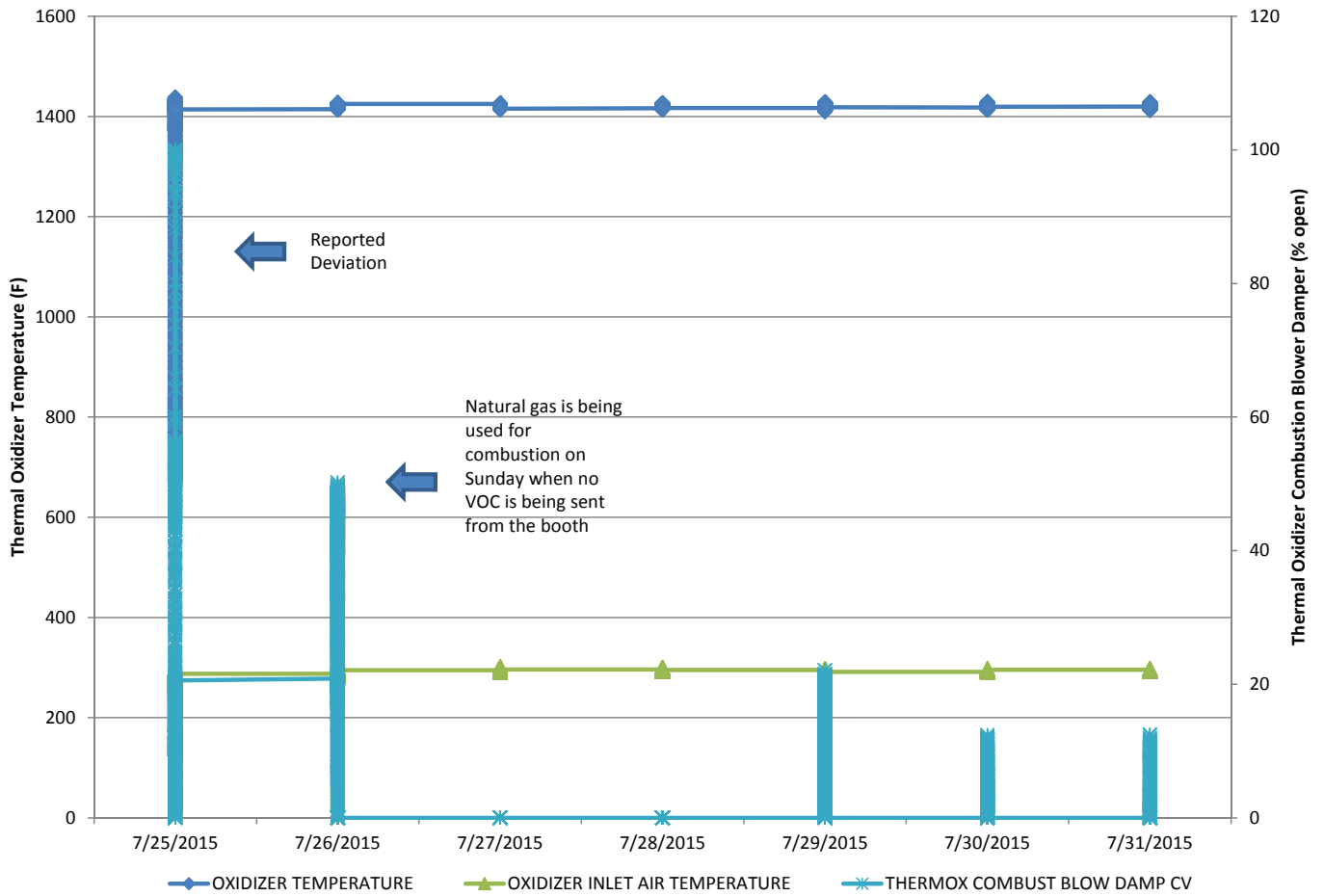


Figure 2b. Prime Abatement (11/1/15 - 11/8/15)

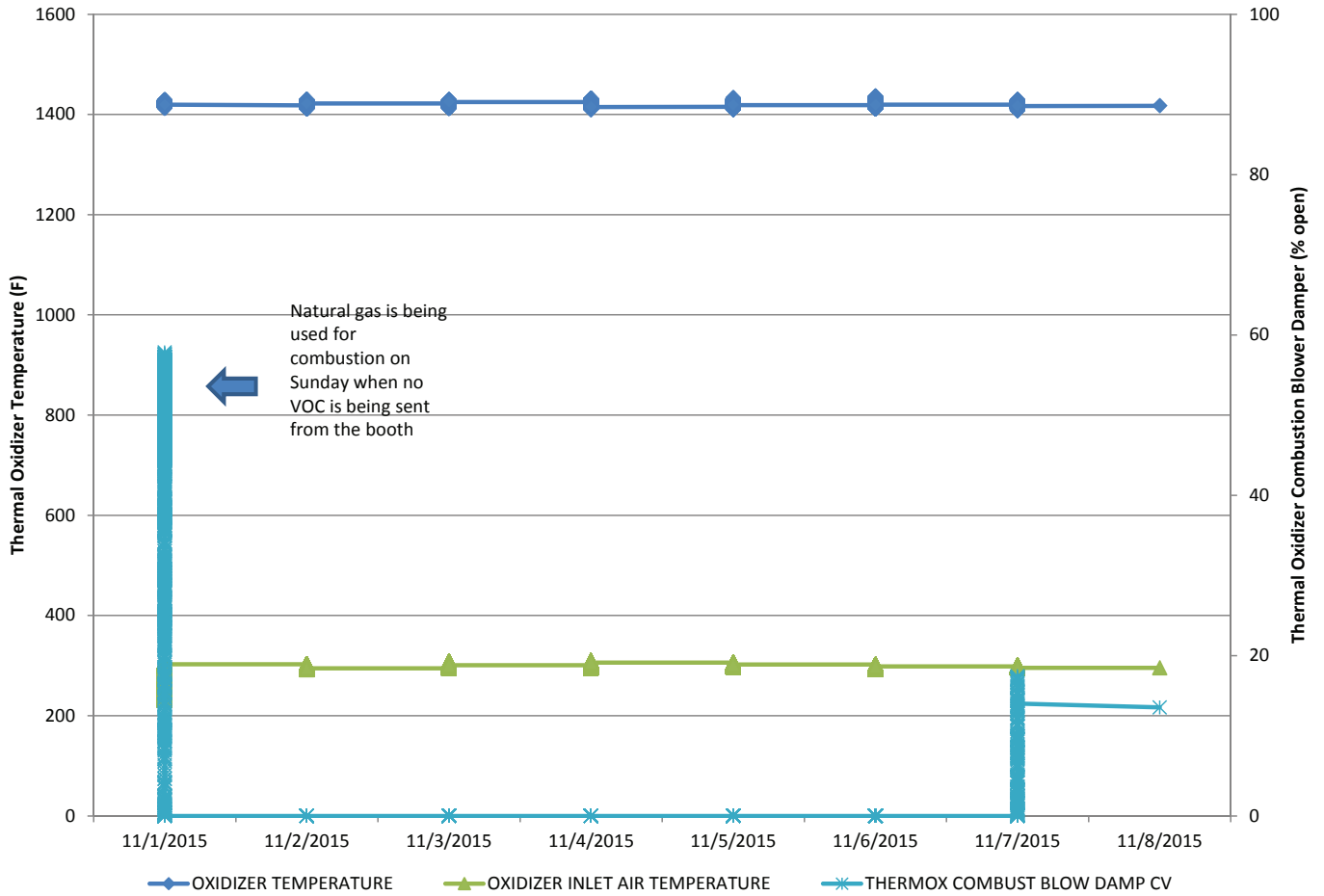


Figure 2c. Prime Abatement Operation (4/4/16 - 4/11/16)

