Great Lakes Works
Environmental Dept.
No. 1 Quality Drive
Ecorse, Michigan 48229

May 26, 2017

EES Case Management Unit
Environmental and Natural Resources Div.
U. S. Department of Justice
Box 7611
Washington, DC 20044-7611

Eric Cohen
Office of Regional Counsel, C-14J
US EPA, Region V
77 West Jackson Blvd.
Chicago, IL 60604

Compliance Tracker (AE-17J)
Air Enforcement and Compliance Assurance
U. S. Environmental Protection Agency
Region 5
77 West Jackson Blvd.
Chicago, IL 60604

Neil D. Gordon
Michigan Dept. of Attorney General
Environment, Natural Resources, and
Agriculture Division
P. O. Box 30755
Lansing, MI 48909

Wilhemina McLemore
Michigan Department of Environmental Quality
Air Quality Division
Cadillac Place, Suite 2-300
3058 W. Grand Blvd – Suite 2-300
Detroit, Michigan 48202-6058

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AIR ENFORCEMENT BRANCH
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Not entered?

Sir/Madam:

Re: *United States, et al. v United States Steel Corporation*
Consent Decree 2:12-cv-304, DJ# 90-5-2-1-06476/1
United States Steel Corporation – Great Lakes Works
The BOP Shop Dirty Gas Main Plan

Pursuant to Paragraph V.D.26. of the above-referenced Consent Decree, U. S. Steel is submitting the BOP Shop Dirty Gas Main Plan for your review.

If you have any questions regarding this matter or require additional information, please contact Alexis Piscitelli at 313-749-3900 or apiscitelli@uss.com.

Sincerely,

Alexis Piscitelli
Director, Environmental Control
Great Lakes Works
United States Steel Corporation

cc: David Hacker (USS)

attachments

U. S. STEEL - GLW #2 BOP DIRTY GAS MAIN PLAN

Effective May 29, 2017 Revision 0

Abstract

The #2 BOP Dirty Gas Main Plan provides written procedure for inspection and maintenance of the #2 BOP Dirty Gas Main ductwork and support structures at the Great Lakes Works facility

Piscitelli, Alexis S

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Section A

Process and Equipment Description

Emissions from the Basic Oxygen Process (BOP) vessels are captured by hoods above the vessels and ducted to the Electrostatic Precipitator (ESP) during the oxygen blow. The particulate emissions from the two BOP vessels are transported from the hoods to the ESP via one of two downcomers (Vessel 25 and Vessel 26) and a common dirty gas main. Between the capture hoods and the ESP control, steam is added to the gas stream. The addition of moisture to the gas stream lowers the resistivity of the particulate entrained in the gas and improves the particulate emission control efficiency of the ESP. The ductwork is equipped with dampers which open or close based on the process occurring in each Vessel. For example, when oxygen is being blown on 25 Vessel, the damper in the 25 Vessel downcomer will be open while the damper on 26 Vessel downcomer will be closed. Oxygen blows do not occur on both Vessels simultaneously.

Section B

Structural Integrity and Moisture Monitoring

The ductwork is visually inspected by trained personnel monthly. The visual inspection includes checking for cracks, holes, dents, excessive corrosion and excessive moisture. During these inspections, the dampers are also inspected and checked for proper operation. Completed inspections are maintained electronically.

The following equipment is included in the monthly inspection:

- 25 Isolation chamber
- 26 Isolation chamber
- 25 Downcomer
- 26 Downcomer
- Dirty Gas Main
- Inlet Header
- Precip. (hoppers and drag chain housings)
- Outlet header

- ID fan housing and ductwork to stack
- Dust silo

Section C

Material Build-up Measurement

There are 14 sounding ports along 25 Vessel downcomer, 26 Vessel downcomer, and the dirty gas main that are used to check for material build-up within the ductwork. A diagram identifying the locations of the sounding ports is included in Section G. Each sounding port has a baseline depth measurement. Depth measurements at each sounding port are taken with a laser and compared with the baseline to determine the build-up in the ductwork. The depth measurements are taken twice per month.

When the dust build-up in either downcomer reaches an average of 2'0" deep or the dirty gas main reaches an average of 3'3" on the west end, ductwork cleaning is scheduled for the next downturn.

When the dust build-up in either downcomer reaches an average of 2'-8" deep, the west end of the dirty gas main reaches an average of 4'-4" deep, or an average of 1'-10" in the east end, operations are shut down and duct cleaning is conducted.

Section D

Structural Deflection Measurement

On the 25 Vessel downcomer and 26 Vessel downcomer there are a total of 6 saddle reference points and 2 truss reference points. A diagram identifying the locations of saddle reference points and truss reference points is included in Section G. Readings are measured using survey equipment to determine the deflection at the mid-span of the truss. The deflection measurements are taken quarterly.

When the deflection measurement exceeds 2 $^{15}/_{16}$" at the mid-span of 25 Vessel downcomer or 2 $^{1}/_{8}$" at the mid-span for 26 Vessel downcomer, an outside structural engineering company is contracted to complete a structural inspection of the equipment. Additional actions will be taken appropriate to the engineering company's finding and recommendations.

Section E

Duct Cleaning

The cleaning of the nonhazardous dust within the duct system is under taken by contracted vacuum trucks. When the level of dust in the duct reach the thresholds described in Section C Paragraph 2, cleaning is scheduled. This scheduled cleaning is meant to coincide with the next anticipated down turn. If the levels of dust in the duct reach the thresholds described in Section C Paragraph 3, a cleaning crew is contacted to begin cleaning immediately.

Section F

Diagram – Potential Accumulation Points

The areas where 25 Vessel downcomer and 26 Vessel downcomer connect to the dirty gas main duct have the potential to accumulate excess material. The volume expansion between the downcomers and the dirty gas main leads to a decreased air flow rate, leading to an increase in particulate settling. Sounding ports 25-2, 25-3, 26-1 and 26-2 measure accumulation at these points as shown in Figure 1.

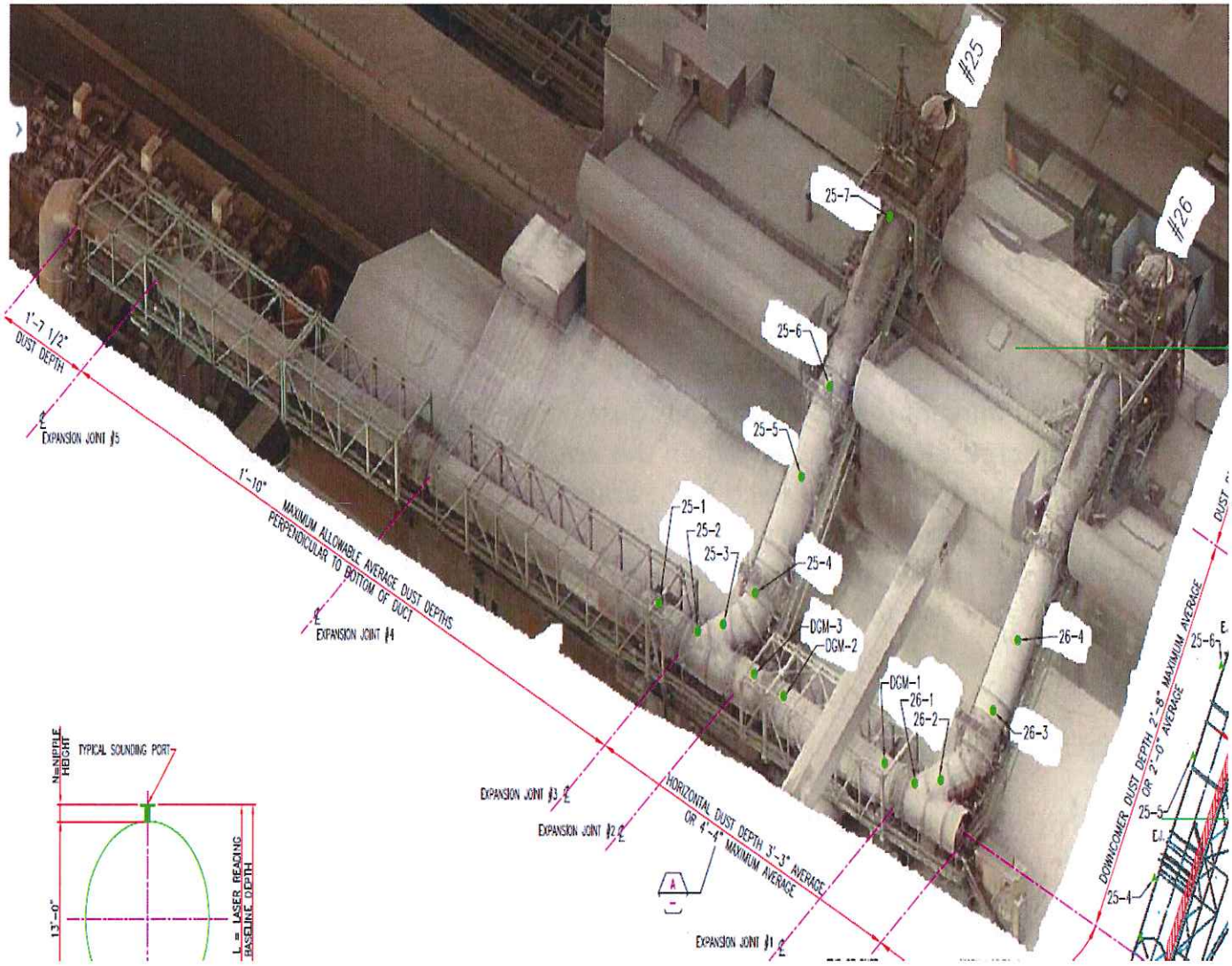
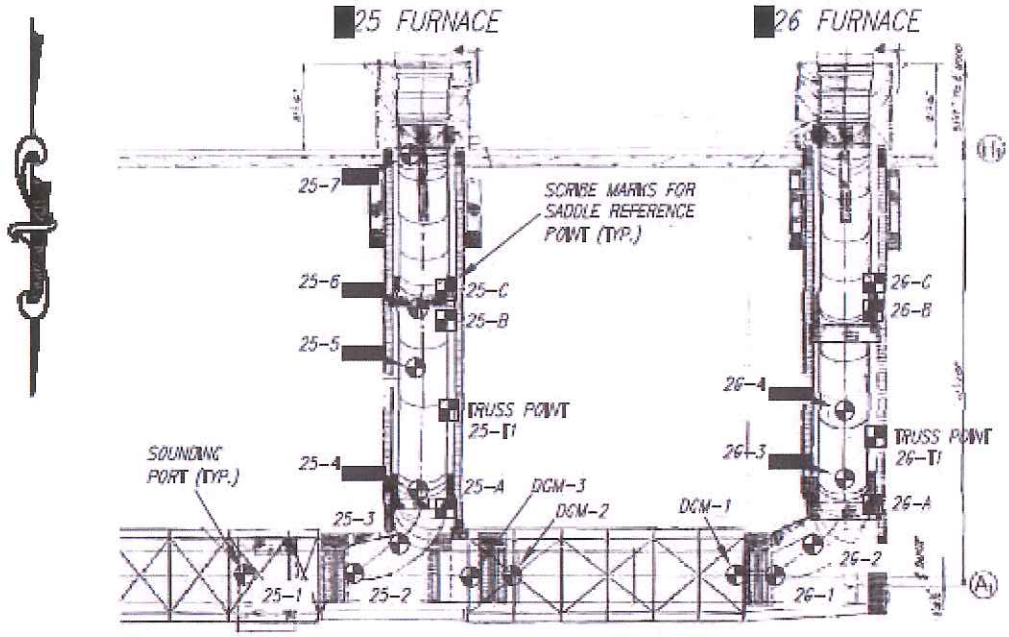


Figure 1. Arial view of 25 Vessel downcomer, 26 Vessel downcomer and the common dirty gas main duct.

Section G

Diagram – Inspection Sounding Ports and Structural Reference Locations

The following diagram shows 25 Vessel downcomer, 26 Vessel downcomer and the common dirty gas main duct. Labeled are the location of the sounding ports, saddle reference points and truss points.



SOUNDING PORT	BASELINE DEPTH	DEPTH MEASUREMENT	DIFFERENCE
25-1	13'-6 3/4"		
25-2	15'-4 3/4"		
25-3	13'-11 3/8"		
25-4	13'-10 1/8"		
25-5	14'-1 1/4"		
25-6	13'-8 3/8"		
25-7	14'-0 1/2"		

BASELINE DEPTH READINGS REVISED USING LASER METHOD 6/3/14

SOUNDING PORT	BASELINE DEPTH	DEPTH MEASUREMENT	DIFFERENCE
26-1	14'-6 3/8"		
26-2	15'-11 1/8"		
26-3	17'-2 5/8"		
26-4	17'-2 1/8"		

BASELINE DEPTH READINGS REVISED USING LASER METHOD 6/3/14

SOUNDING PORT	BASELINE DEPTH	DEPTH MEASUREMENT	DIFFERENCE
DGM-1	13'-10 3/4"		
DGM-2	13'-9 1/4"		
DGM-3	13'-7 5/8"		

SADDLE REF. POINT	BASELINE READING	MEASUREMENT	DIFFERENCE
25-A	0"		
25-B	0"		
25-C	0"		

SADDLE REF. POINT	BASELINE READING	MEASUREMENT	DIFFERENCE
26-A	9/16"		
26-B	7/16"		
26-C	5/16"		

TRUSS REF. POINT	DIFF. NORTH/SOUTH	DIFF. EAST/WEST	DIFF. ELEVATION
25-T1			
26-T1			

DATE MEASURED: _____

DLZ
DLZ INDUSTRIAL, LLC

ECORSE MICHIGAN
US STEEL – GREAT LAKES WORKS
#2 BOP
#25 & #26 FCE DOWNCOMERS
MONITORING SURVEY

DRAWN: BDN | CHK'D.: ADG
DESIGNED: – | APPRV'D.: –
DATE:
SCALE: NTS
PROJECT NUMBER 1450-2545-70
SHEET 1 OF 1
DRAWING NUMBER 2545MON01

Figure 2. Example inspection form with locations for the sounding ports, saddle reference points and truss points of 25 Vessel downcomer, 26 Vessel downcomer, and the dirty gas main.

Section H

Action Level Identification and Corrective Action

Issue	Operation	Corrective Action
Cracks and holes	Visual inspection	Patching crew brought in to conduct repairs
Dents	Visual Inspection	Area evaluated and monitored for potential damage
Excessive corrosion	Visual Inspection	Area evaluated and tracked; may need patch
Excessive moisture	Visual inspection	Check upper section of boilers and make repairs

The depth measurements for dust levels are taken twice per month and structural defection measurements are taken quarterly.

For the dust depth measurements as described in Section C:

When the dust build-up in either downcomer reaches an average of 2'0" deep or the dirty gas main reaches an average of 3'3" on the west end, ductwork cleaning is scheduled for the next downturn.

When the dust build-up in either downcomer reaches an average of 2'-8" deep, the west end of the dirty gas main reaches an average of 4'-4" deep, or an average of 1'-10" in the east end, operations are shut down and duct cleaning is conducted.

For the structural deflection measurements as described in Section D:

When the deflection measurement exceeds 2 $^{15}/_{16}$" at the mid-span of 25 Vessel downcomer or 2 $^{1}/_{8}$" at the mid-span for 26 Vessel downcomer, an outside structural engineering company is contracted to complete a structural inspection of the equipment. Additional actions will be taken appropriate to the engineering company's finding and recommendations.

If a malfunction occurs that causes or may cause excess emissions during plant operations, the equipment causing the possible excess emissions will be evaluated as soon as practicable in accordance with safe operating procedures to determine the proper procedure to correct the problem or to determine that the malfunction will not cause excess emissions.