

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION

ACTIVITY REPORT: Scheduled Inspection

A780938801

FACILITY: U S STEEL GREAT LAKES WORKS		SRN / ID: A7809
LOCATION: 1 QUALITY DR, ECORSE		DISTRICT: Detroit
CITY: ECORSE		COUNTY: WAYNE
CONTACT: Alexis Piscitelli , Environmental Manager		ACTIVITY DATE: 03/03/2017
STAFF: Katherine Koster	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MEGASITE
SUBJECT: FY2017 Scheduled Inspection - CGL, HSM, Main Plant generators		
RESOLVED COMPLAINTS:		

Reason for Inspection: FY2017 Targeted Inspection – Continuous Galvanizing Line, Hot Strip Mill, Electrogalvanizing Line, Emergency Generators

Level of Inspection: PCE

Inspected by: Katie Koster, AQD

Personnel Present: Nathan Ganhs, Environmental Engineer

Facility phone number: 313-749-3857, 313-378-1612 (cell)

\*\*\*\*\*

**FACILITY BACKGROUND**

United States Steel, Great Lakes Works (USS – GLW) is an integrated steel mill in operation since August 1930. It is located just south of the City of Detroit. The site consists of approximately 1100 acres that span along the Detroit River through the cities of Ecorse and River Rouge. The facility includes the Main Plant Area, the 80-inch Hot Strip Mill, and the iron making and coke making operations on Zug Island.

This inspection report focuses on the continuous galvanizing line (CGL), hot strip mill (HSM), some of the emergency generators on site located at the Main Plant, and the electrogalvanizing line (EGL). In the ROP, these are known as the following: EGEGL-OPERATIONS, EGREACTOR1 – 10, EGEGL-STO-TANKS, EGCON-GALV-LINE, EG80MILLFURNCS. The following generators are not in the ROP but are permitted under 96-12A, EUEMERGEN4 A 2922, EUEMERGEN5 2922. The remaining generators are not permitted and/or not in the ROP at this time.

**COMPLAINT/COMPLIANCE HISTORY**

No complaints have been received related to the CGL, HSM, EGL, or emergency generators which are the emission units that are the subject of this report.

**OUTSTANDING CONSENT ORDERS**

The CGL is operating under Consent Order 33-2015 as a stack test and inspection revealed that the facility was operating the annealing furnace without the use of the selective catalytic reduction system which is a pollution control device for NOx. As such, they were not meeting the NOx limit.

A burner had to be installed in the ductwork before the SCR system in order to ensure the temperature of the furnace exhaust gas entering the SCR system was sufficient to initiate the reaction to control NOx.

Consent Order 50-2014 was the originally issued consent order which was revised to CO 33-2015 which adjusted the compliance timeline and increased the monetary penalty.

The HSM is not operating under any consent orders although it is an emission unit that is part of the proposed SO2 non-attainment SIP for a portion of Wayne County.

Two of the emergency generators associated with the HSM operations were referred to the enforcement



unit for failure to obtain a PTI and the facility refused to apply for one for an extended period of time. However, a permit application was finally submitted, and no further enforcement action was warranted.

#### OUTSTANDING LOVs

There are no outstanding LOV's related to the equipment that was inspected.

#### INSPECTION NARRATIVE

On March 3, 2017, AQD inspector Katie Koster arrived at USS around 9:30 and proceeded to the CGL with Mr. Nathan Ganhs, USS Environmental Engineer. The line was down due to an issue with the zinc pot. As such, we met with Mr. Al Blevens, manager, and he presented some of the environmental records associated with the CGL. I returned to the site on March 30 and we conducted a full walkthrough with Mr. Blevens.

##### Continuous Galvanizing Line

Zinc galvanizing is performed on steel that will be used on "exposed" parts which have a high likelihood of rusting. Annealing occurs first to soften and improve the formability of the steel strip prior to being coated with zinc. The galvanizing line is composed of a welder/tension leveler controlled by a dust collector, an electrolytic caustic precleaner controlled by a mist scrubber, a strip dryer, an annealing furnace controlled by selective catalytic reduction unit, cooling tower, zinc dip tank, dryers, and a line oiler and a new phosphorus chromate coating section. The new coating section is to provide an extra layer of corrosion resistance but it has not been put into operation yet as there are no customers. There are 1.3 miles of steel running through the line at any given time.

Some parts are galvanealed and some are galvanized which is essentially the same but results in a matte vs. spangled finish; it depends on the customer preference. Natural gas fired edge burners are used in the galvanealing process to ensure the edges of the steel strip are maintained at the proper temperature.

First, the off-gauge part of the steel coil is cut off at the entry end of the process and two coils are welded together. After the welder and tension leveler, the strip enters the electrolytic cleaning process. The cleaning tank contains an NaOH solution and four brushes scrub the steel strip. Hot water is used which is heated with residual heat from the annealing furnace. The process is controlled by a water scrubber which runs continuously. Once per shift, the water flow rate is recorded and twice a year the inside of the scrubber is cleaned. There is also a low flow alarm. During the inspection, I recorded a water flow rate of 57.5 gpm. The system is set to alarm at 35 gpm or lower as a low flow condition. In the center operators' pulpit, the scrubber flow was also registering at 58 gpm. Apparently, the scrubber was replaced last year when the burner upstream of the SCR system was installed. One fan for the scrubber has been replaced since then. I inquired about any maintenance or operational issues with the new scrubber. I was informed that there was a low flow situation and the corrective action was to clean some nozzles. I discussed the maintenance program with USS personnel. Hard copy inspection records had not been maintained after they were entered as complete into the system; the planner (Russ O Neal) stated he will maintain them in the future. A log of the inspection and maintenance completion dates was provided (attached).

Next, we proceeded to the annealing furnace where the temperature can be as high as 2000F. NOx emissions from the furnace are controlled by the SCR system whereby urea is injected in the exhaust gas from the furnace to convert the NOx to N2, H2O, and CO2. There is also a catalyst bed present to foster the necessary reaction. The urea injection rate is dependent upon the measured NOx value before the gas stream enters the control device and is constantly changing. The exhaust gas has to be at a minimum temperature before urea is injected. Facility has the set point at 600F. If the exhaust gas/inlet gas to the SCR is not at the required minimum temperature for a reaction to occur, a burner is present that automatically turns out to heat the air. Previously, there was no duct burner and the facility was not using the SCR when the temperature was not at the minimum needed for a reaction. Stack testing revealed the NOx hourly limits could not be met during this scenario. This was the subject of CO 33-2015 and resulted in the burner being installed. According to USS, there is no scheduled preventative maintenance for the burner as it is apparent whether it is working. The NOx and O2 inlet and exit



analyzers self-calibrate every day and there are quarterly audits of the calibration gas cylinders. At the time of the inspection, the NO analyzer was reading 2.79 ppm, NOx was 3.21 ppm, and NOx corrected was 1.08 lb/hr. The urea tank is nearby and has a low-level alarm. At the time of the inspection, urea flow was 6.0 gph and urea tank level was 3.05

In the center pulpit, I observed that the duct burner was not on because the inlet temperature was already at 771.5F.

After exiting the furnace, the strip enters a cooling tower because if it is too hot, it will collect too much zinc and the excess zinc will stick to rollers in the line. The strip exits the furnace around 1480F and enters the 300 ton molten zinc bath at around 920F. There is a zinc premelt pot which is necessary to control the aluminum content in the pot. Next, the strip enters skin pass mill (temper mill) where it is sprayed with a 1% rolling solution to prevent rolling defects, then the electrostatic oiler for rust prevention, and the vertical looper. Four different oils were previously in use but at this time only Ferrocote 61MAL and 61A are being applied. Quaker Chemical reports the usage to USS based on how much they have ordered and how much Quaker comes to take away in waste. The permit was recently modified to apply a phosphorus and chromate coating in 2015 (98-15, 219-06B). Nitrogen and hydrogen are used for cooling plus water. The presence of oxygen will cause scaling. Finally, the strip is recoiled and packaged. According to Mr. Blevens, USS GLW can make and process jumbo rolls through the CGL which is the only operation that can domestically.

Edge burners are used when products are galvanealed. There is a separate natural gas meter solely for the edge burners. The area manager showed us the location of the meter. I recorded a readout of 0554 X 100. There is another meter for the natural gas usage for the furnace. Natural gas usage is recorded every turn from the DSC center pulpit. The natural gas usage for the edge burners is read at the end of each month.

During the most recent stack test, the urea injection rate fluctuated between 5.66-6.83 gal/hr and the edge burners were not in use.

Mr. Blevens also mentioned that zinc rusts white and the steel has to be the same temperature as the zinc for proper coating.

#### Hot Strip Mill

On March 3, 2017, Mr. Gahns and I also entered the hot strip mill. I did not observe any visible emissions from the building roof while approaching the building. There are 5 reheat furnaces in the hot strip mill. Generally, the mill is running three to four of the furnaces at a time. We went to the reheat furnace control room where we spoke to the main operator. She stated that USS stopped combusting coke oven gas in the HSM furnaces about a year ago. Facility did a "stack test" to get another NOx emission factor for natural gas. AQD was not aware of this test until after it occurred. See attached results. The results have not been reviewed and approved by AQD.

#### Emergency Generators

Mr. Gahns and I also viewed the following generators:

- Two generators associated with the Hot Strip Mill operations
- 75 HP diesel fire pump for P Bldg., manufacture date: 11/06; hour meter read 227.4 hours
- 165 HP diesel water pump for No 2 caster, remanufactured 1985 block, hour meter read 30 hours
- 205 HP diesel water pump for No. 2 caster, remanufactured 1985 block, hour meter read 44.5

#### Electro galvanizing Line

This equipment is no longer in operation. It was shut down several years ago when USS purchased the old Double Eagle Facility in Dearborn on Miller Road to perform electro galvanizing.

It needs to be evaluated whether the Dearborn facility should become a part of the A7809 Stationary Source.

#### APPLICABLE RULES/PERMIT CONDITIONS

Permit to Install (PTI) 219-06B addresses excess NOx emissions from the CGL with the installation of a duct burner to heat the gas entering the SCR to ensure it is at the proper temperature for a reaction. PTI

98-15 was issued to modify the cleaning section of the CGL and add a new phosphate and chromic acid coating operation. The following conditions are from PTI 98-15. This permit has not yet been incorporated into existing ROP. There are no other conditions in the existing ROP that would conflict with this PTI or that are not covered in the PTI.

**The following conditions apply to: EUCON-GALV-LINE-S1**

Continuous galvanizing operations including: 1. Continuous galvanizing line 2. Continuous galvanizing line annealing furnace 3. Continuous galvanizing line selective catalytic reduction unit with exhaust gas NO<sub>x</sub> and Oxygen analyzers 4. Burner to heat exhaust if needed before entering the selective catalytic reduction unit 5. Continuous galvanizing line oiler 6. Continuous galvanizing line pre-cleaner mist scrubber 7. Phosphorus and Chromate coating section

**POLLUTION CONTROL EQUIPMENT:** Pre-cleaner mist scrubber and Selective Catalytic Reduction Unit.

**I. EMISSION LIMITS**

**1. IN COMPLIANCE.** The most recent stack test resulted in a NO<sub>x</sub> lb/hr value of 0.2 for the annealing furnace. The edge burners were not in use and the duct burner had not been installed. However, the bulk of the emissions are from the furnace and these two ancillary operations would not cause the NO<sub>x</sub> emissions to increase from 0.2 to over 7.24 lb/hr. See attached email from the facility. For example, annual NO<sub>x</sub> emissions from the burners based on natural gas usage and AP42 emissions factors were 0.18 lbs NO<sub>x</sub>. Total combined nitrogen oxide emissions as nitrogen dioxide (NO<sub>x</sub>) is limited to 7.24 pounds per hour from the EUCON-GALV-LINE-S1 Annealing Furnace, including the burner and the edge burners of the hot dip galvanizing line in the G-Building

**2. IN COMPLIANCE.** Based on the attached records, the highest twelve month rolling NO<sub>x</sub> emissions from January 2016 through February 2017 was 16.58 tons. Total combined nitrogen oxide emissions as nitrogen dioxide (NO<sub>x</sub>) is limited to 27.51 tons per year based on a 12-month rolling time period as determined at the end of each calendar month for the EUCON-GALV-LINE-S1 Annealing Furnace and the edge burners of the hot dip galvanizing line in the G-Building.

**3. IN COMPLIANCE.** Based on the most recent stack test in May 2013, the NO<sub>x</sub> emissions rate (average over three runs) from the annealing furnace was 0.2 lb/hr. Total combined nitrogen oxide emissions as nitrogen dioxide (NO<sub>x</sub>) are limited to 6.6 pounds per hour as determined by the average of three one-hour time periods by testing or otherwise determined by the testing protocol agreed upon by AQD. This applies to EUCON-GALV-LINE-S1 Annealing Furnace controlled by a Selective Catalytic Reduction (SCR) unit.

**4. IN COMPLIANCE.** Based on the attached records, highest twelve month rolling NO<sub>x</sub> emissions from January 2016 through February 2017 was 16.58 tons. Total combined nitrogen oxide emissions as nitrogen dioxide (NO<sub>x</sub>) 25 tons per year based on a 12-month rolling time period as determine at the end of each calendar month from EUCON-GALV-LINE-S1 Annealing Furnace controlled by a Selective Catalytic Reduction (SCR) unit.

**5. IN COMPLIANCE.** Based on the most recent stack test on March 13, 2013, the PM emissions rate (average over three runs) was 0.04 lb/hr. Particulate Matter is limited to 0.26 pounds per hour as determined through reference test method 5 from the EUCON-GALV-LINE-S1 Electrolytic cleaning process equipment controlled by a cross flow packed bed scrubber system

**6. IN COMPLIANCE.** Based on the attached records, highest 12 month rolling VOC emissions from January 2016 through February 2017 was 15.58 tons. VOC is limit to 28.91 tons per year based on a 12-month rolling time period as determined at the end of each calendar month from the EUCON-GALV-LINE-S1 Rust preventive oil application electrostatic spray unit operation

**7. IN COMPLIANCE.** Based on the SDS's, the highest VOC content of the oils used is 0.44 lb/gal for Ferrocote 61MAL HCL. VOC content is limited to 0.44 pound per gallon of oil per Method 24 or other AQD approved method for the EUCON-GALV-LINE-S1 Rust preventive oil application electrostatic spray unit operation.

**8. IN COMPLIANCE.** Based on the most recent stack test in May 2013, the ammonia emissions rate from the annealing furnace (average over three runs) was 0.6 lb/hr. Ammonia is limited to 1.44 pounds per hour as determined by the average of three one-hour time periods by testing or otherwise determined by the testing protocol agreed upon by AQD from EUCON-GALV-LINE-S1 Annealing furnace controlled by

SCR unit.

9. NOT APPLICABLE. This operation has not started yet. Phosphoric Acid is limited to 4.4 pounds per hour on a 24-hour average from the EUCON-GALV-LINE-S1 Phosphorus and Chromate Coating operation.

## II. MATERIAL LIMITS

1. IN COMPLIANCE. From January 2016 through February 2017, the highest 12 month rolling tons of galvanized steel produced was 504,402 tons in June 2016. See attached. 850,000 tons galvanized steel processed per year based on a 12-month rolling time period as determined at the end of each calendar month from EUCON-GALV-LINE-S1.

2. IN COMPLIANCE. From January 2016 through February 2017, the highest 12 month rolling natural gas usage was 440.642 MMCF in October 2016. See attached. 838.6 million cubic feet per year of natural gas based on a 12-month rolling time period as determined at the end of each calendar month from EUCON-GALV-LINE-S1 Annealing Furnace, including the duct burner, and Edge Burners.

3. NOT APPLICABLE. According to Mr. Blevens, this process has not been started up yet. Phosphoric Acid is limited to 105.6 pounds per day on a 24-hour average from the EUCON-GALV-LINE-S1 Phosphorus and Chromate Coating operation.

## III. PROCESS/OPERATIONAL RESTRICTIONS

1. IN COMPLIANCE. The OMP and MAP were received on June 30, 2016. The main update was the addition of the duct burner and the catalyst is checked annually and either cleaned or replaced. According to attached maintenance records, catalyst was changed in 2014 and 2016. The permittee shall not operate the continuous galvanizing line, EUCON-GALV-LINE-S1, unless an Operation and Maintenance Plan (OMP) as described in Rule 911(2) has been submitted to the AQD District Supervisor. The permittee shall submit an updated OMP including the burner no later June 29, 2016, or 210 days after the issuance of Permit to Install 219-06B, whichever is later. The OMP shall include monthly inspections of all systems associated with the urea feed system, describe preventative maintenance consistent with the manufacturer's recommendations, and include a requirement for periodic determination of the functional viability of the catalyst. The OMP shall also include a requirement to repair any defect that could reasonably be expected to result in non-compliance identified during any inspection within a reasonable time period.

2. IN COMPLIANCE. The OMP and MAP were received on June 30, 2016. The main update was the addition of the duct burner. Averaging time for the alarms is not in the plan; facility to update. The permittee shall not operate the continuous galvanizing line, EUCON-GALV-LINE-S1, unless a Malfunction Abatement Plan (MAP) as described in Rule 911(2) has been submitted to the AQD District Supervisor. The permittee shall submit an updated MAP including the burner no later than June 29, 2016, or 210 days after the issuance of Permit to Install 219-06B, whichever is later. The MAP shall include the annealing furnace controlled by the SCR unit, the burner, and the electrolytic cleaning equipment controlled by a packed bed scrubber. It shall address alarm conditions that indicate abnormal functioning of the system including the operating parameter values and associated averaging time that would trigger the alarm.

3. IN COMPLIANCE. Documents were submitted. AQD did not issued a formal approval so the plans were approved by default after 90 days. The permittee shall submit the OMP and MAP and any amendments to the OMP or MAP to the AQD District Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the OMP, MAP, amended OMP or amended MAP shall be considered approved. Until an amended plan is approved, the permittee shall implement corrective procedures or operational changes to achieve compliance with all applicable emission limits. If at any time the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the permittee shall amend the MAP within 45 days after such an event occurs. The permittee shall also amend the OMP/MAP within 45 days, if new equipment is installed. The permittee shall review the OMP/MAP upon request from the District Supervisor.

## IV. DESIGN/EQUIPMENT PARAMETERS

1. IN COMPLIANCE. Automatic control system is in place. Urea flow rate alarm would be main indicator of abnormal functioning. Alarms flash on the HMI screen in the operator's pulpit and they are

recorded in the shift report. The SCR unit shall be equipped with an automatic urea feed injection system controlled by an automatic control system based on feedback and feed forward controls. This automatic control system shall be equipped with an alarm that will indicate any abnormal functioning of the system as described in the MAP.

2. **IN COMPLIANCE.** Water flow gauge is installed and routinely calibrated. During the inspection, I recorded a flow rate of 57.5 gpm. According to the OMP/MAP, flow rate below 35 gpm triggers an alarm. The scrubber is inspected on a monthly, quarterly, and yearly schedule. Records were presented during the inspection. Attached is a summary view of inspections completed over the last year. The permittee shall not operate the electrolytic cleaning process equipment unless the cross flow packed bed scrubber is installed and operating properly. A minimum water flow rate of gallons per minute or other rate established during compliance testing shall be maintained. The permittee shall install a flow gauge to measure the water flow rate.

Note, there is a typo in this condition, "a minimum flow rate of gallons per minute" but 30 gpm is referenced in condition VI.9.

3. **IN COMPLIANCE.** NO<sub>x</sub> and O<sub>2</sub> analyzers are installed and calibrated. Automatic calibrations occur at monthly intervals. NO<sub>x</sub> and Oxygen concentrations in the exhaust gases from the annealing furnace controlled by the SCR unit shall be monitored using NO<sub>x</sub> and Oxygen analyzers and the automatic calibration equipment shall be programmed pursuant to the manufacturer's specifications on a time frame acceptable to the AQD District Supervisor.
4. **IN COMPLIANCE.** A letter was received that burner was installed on May 6, 2016. The location of the burner was presented during the inspection. Catalyst bed temperature was above the minimum of 600F, which is the facility's set point, during the inspection. On the "Center Section Checklist" (attached), the exhaust temperature entry is the inlet to the catalyst bed temp and is noted at 745 on 2/27/17. This value is recorded once per shift and also alarms on the operator control screen if it is too low. Mr. Blevens stated that USS will change the nomenclature from exhaust temp to SCR entry temp or something similar for a clearer indication of the temperature that is being portrayed. Burner turns on/off automatically based on the temperature set point. Effective April 30, 2016 or 150 days after the issuance of Permit to Install 219-06B, whichever is later, the permittee shall not operate the galvanizing line unless the SCR unit and associated burner are installed and operating properly. Proper operation includes, but is not limited to, maintaining a minimum catalyst bed inlet temperature of 475 degrees Fahrenheit during production mode of operation. The unit shall be considered in production mode if the main burners are firing and the product is moving through the continuous annealing furnace.
5. **IN COMPLIANCE.** There are reportedly alarms that flash on the HMI control screen for inlet temp and urea injection rate. Operators cannot use the control screen without acknowledging the alarm. An automated email also goes out to managers. Effective 150 days after the issuance of Permit to Install 219-06B, the permittee shall not operate the galvanizing line unless the SCR alarms monitoring the catalyst bed inlet temperature and urea injection rate are installed, maintained, and operating properly as specified in the OMP and MAP. The unit shall be considered in production mode if the main burners are firing and the product is moving through the continuous annealing furnace.

#### **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. (R 336.1201(3))

1. **IN COMPLIANCE.** The prior test was performed in October 2013 and the next test is due by October 2018. The SCR was in operation during the testing this time. The permittee shall conduct a nitrogen oxides and ammonia emission test from the annealing furnace/SCR unit during operation once every five years or more frequently upon the request of AQD. Nitrogen oxides emission testing shall be performed using Reference Method 7E or other approved method and ammonia emission testing shall be performed using an approved method. No less than 30 days prior to testing, a complete stack test protocol must be submitted to AQD for approval. The final plan must be approved by the AQD prior to testing.
2. **IN COMPLIANCE.** The prior test was performed in March 2013 and the next test is due in March 2018. The permittee shall conduct a particulate matter emission test from the cross flow packed scrubber stack during operation once every five years or more frequently upon the request of AQD. Particulate emission testing shall be performed using Reference Method 17 or other approved

method. No less than 30 days prior to testing, a complete stack test protocol must be submitted to AQD for approval. The final plan must be approved by the AQD prior to testing.

## **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. (R 336.1201(3))

1. **IN COMPLIANCE.** I viewed the continuous monitoring of the NO<sub>x</sub> and O<sub>2</sub> concentrations from the analyzers. NO<sub>x</sub> corrected, which is the NO<sub>x</sub> value after SCR treatment is recorded once per shift on the Center Section Checklist (attached). The permittee shall monitor NO<sub>x</sub> and Oxygen concentrations in the exhaust gases from the annealing furnace controlled by the SCR unit using the NO<sub>x</sub> and Oxygen analyzers. The permittee shall continuously monitor outlet NO<sub>x</sub> concentration and record the concentration once per shift as an indicator of proper operation of the Selective Catalytic Reduction (SCR) during production mode of operation. The unit shall be considered in production mode if the main burners are firing and the product is moving through the continuous annealing furnace.
2. **IN COMPLIANCE.** Urea flow is continuously monitored as shown on the operators HMI screen and recorded once per shift on the Center Section Checklist (attached). If there is an alarm triggered during the operator's shift, it flashes on the HMI screen and is noted in the Checklist or Turn Manager Shift Report (attached) in the comment or operational issues section. An email is automatically generated and sent to management. According to Mr. Gahns, no alarms have been generated. The permittee shall continuously monitor the urea injection rate and record at least once per shift as an indicator of proper operation of the SCR during production mode of operation. In the event the urea injection rate alarm is triggered, corrective action must be initiated to determine the cause of the alarm within 1 hour of the alarm. The unit shall be considered in production mode if the main burners are firing and the product is moving through the continuous annealing furnace.
3. **IN COMPLIANCE.** On the "Center Section Checklist" (attached), the exhaust temperature entry is the inlet to the catalyst bed temp and is noted at 745F on 2/27/17. This value is recorded once per shift and also alarms on the operator control screen if it is too low. Mr. Blevens stated that USS will change the nomenclature from exhaust temp to SCR entry temp or something similar for more clear indication of the temperature that is being portrayed. If there is an alarm triggered during the operator's shift, it flashes on the HMI screen and is noted in the Checklist or Turn Manager Shift Report (attached) in the comment or operational issues section. An email is automatically generated and sent to management. According to Mr. Gahns, no alarms have been generated. The permittee shall continuously monitor catalyst bed inlet temperature and record the inlet temperature at least once per shift as an indicator of proper operation of the SCR. In the event the catalyst bed inlet temperature alarm is triggered, corrective action must be initiated to determine the cause of the alarm within 1 hour of the alarm.
4. **UNKNOWN.** Facility claims that no excursions have been experienced as there have been no alarm conditions. An excursion is a departure from the indicator range defined in the MAP and/or OMP. Upon detecting an excursion or exceedance, the owner or operator shall restore operation of EUCON-GALV-LINE-S1 (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions).
5. **IN COMPLIANCE.** Cylinder gas audits are performed quarterly and were presented during the inspection. The permittee shall conduct a cylinder gas audit on the NO<sub>x</sub> and Oxygen analyzers once each calendar quarter to assess the accuracy of the data collected by the monitors using a method acceptable to the AQD District Supervisor.
6. **IN COMPLIANCE.** See attached email. Facility is reporting that there have been no abnormal functions of the injection system or the SCR. According to the facility, a system is in place to review the alarms recorded on the shift report by a manager who signs off on the report and no alarms have been triggered. An example of the task tracking is attached. The facility is going to update the task description to include inlet temperature. The permittee shall record each occurrence of abnormal functions by the automatic control system of the automatic urea feed injection system of the SCR as defined in the MAP and make the records available to AQD upon request.

7. **IN COMPLIANCE.** Monthly and 12 month rolling values for 2016 and part of 2017 are attached. The permittee shall keep records of the total amount of galvanized steel processed per month and rolling 12-month time period as determined at the end of each calendar month. These records shall be made available to AQD upon request..
8. **IN COMPLIANCE.** Urea usage is tracked daily and was presented during the inspection. The permittee shall keep records of the total amount of urea usage per day and make the records available to AQD upon request
9. **IN COMPLIANCE.** At this time, a flow rate below 35 gpm triggers an alarm. No low flow alarms below 30 gpm have been triggered. Flow rate is recorded daily on the shift report (attached). The permittee shall keep records of the water flow rate reading in the cross flow packed bed scrubber daily and make the records available to AQD upon request. Permittee shall take appropriate corrective action if flow rate is below minimum of 30 gallons per minute or other flow established during stack testing and shall keep records of corrective action taken
10. **IN COMPLIANCE.** Calibration and maintenance activities are regularly scheduled and records were presented during the inspection. The permittee shall keep records of the calibration and maintenance activities conducted on the automatic calibration equipment for the NO<sub>x</sub> and Oxygen Analyzers and make the records available to AQD upon request<sup>2</sup>.
11. **IN COMPLIANCE.** See attached records. The applicant shall keep a record of the following concerning the use of the rust preventive oil application electrostatic spray unit of the hot dip galvanizing line:
  - a. The amount applied in gallons on a monthly and 12 month rolling basis as determined at the end of each calendar month. Gallons per month in attached. 12 month rolling
  - b. The VOC content of each oil applied
  - d. VOC emission calculations determining the total mass emissions on a monthly and 12 month rolling basis as determined at the end of each calendar month.(There is a typo in the permit and bullet point c is skipped)
12. **IN COMPLIANCE.** Monthly records for 2016 are attached. The permittee shall monitor and record the total and separate monthly natural gas usage for both the edge burners and the annealing furnace including the burner in a manner and with instrumentation acceptable to the AQD District Supervisor. Acceptable instrumentation and manner of recording are natural gas meters and total natural gas usage summary every end of the month recorded by the permittee. The permittee shall keep records of the total natural gas usage for the annealing furnace and edge burners based on the 12-month rolling time period as determined at the end of each calendar month and make the records available to AQD upon request.
13. **IN COMPLIANCE.** Monthly NO<sub>x</sub> emissions records are being maintained. The permittee shall keep records of monthly and 12 month rolling NO<sub>x</sub> emissions calculations at the end of each calendar month for the annealing furnace and edge burners and make the records available to AQD upon request.
14. **IN COMPLIANCE.** Records of inspections and maintenance of the SCR, including catalyst bed, were presented during the inspection. The permittee shall maintain records as necessary to demonstrate compliance with the Operation and Maintenance Plan (OMP) including, but not limited to, records of inspections, maintenance and repair for the SCR system.
15. **DID NOT EVALUATE.** Did not evaluate the presence of parts for repair. The permittee shall properly maintain the monitoring system including maintaining necessary parts for routine repair of the monitoring equipment.
16. **DID NOT EVALUATE.** Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the owner or operator shall conduct all monitoring in continuous operation (or shall collect data at all required intervals) at all times that the pollutant-specific emissions unit is operating. Data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities shall not be used for purposes of this part, including data averages and calculations or fulfilling a minimum data availability requirement, if applicable. The owner or operator shall use all the data collected during all other periods in assessing the operation of the control device and associated control system. A monitoring

malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

17. **DID NOT EVALUATE.** The permittee shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan and any activities undertaken to implement a quality improvement plan, and other information such as data used to document the adequacy of monitoring, or records of monitoring maintenance or corrective actions.
18. **IN COMPLIANCE.** SDS sheets are available and were presented during the inspection. Coatings appear to be the same as the prior inspection. The permittee shall obtain the material safety data sheets (MSDS) for all coatings and cleaners used in EUCON-GALV-LINE-S1. The permittee shall maintain a copy of all versions of MSDS for each material utilized on-site with corresponding dates of material content changes on file and make them available to AQD upon request.
19. **NOT APPLICABLE.** According to Mr. Blevens, shift manager, this process has not yet started. The permittee shall keep the following information on a daily basis for EUCON-GALV-LINE-S1
  - a. Gallons of each liquid material used containing phosphoric acid.
  - b. Phosphoric Acid content of each material on a pound per gallon basis
  - d. Calculation of the total pounds of phosphoric acid used per day
  - e. Phosphoric Acid emission calculations determining the average hourly emission rate in pounds per hour based on daily use

The permittee shall keep the records in a format acceptable to the AQD District Supervisor. The permittee shall keep all records on file and make them available to the Department upon request.

20. **IN COMPLIANCE.** Facility claims that no alarms have been triggered. See attached email. The permittee shall maintain records of the date and time each time the urea injection or catalyst bed temperature alarm was triggered, date and time the corrective action was initiated, the corrective action taken, and the time and date when corrective actions were completed in response to an alarm. Records shall also contain the operating parameter and value that triggered the alarm and the value at the time the corrective action is completed.

## **VII. REPORTING**

1. **DID NOT EVALUATE.** No semi annual reports have been received. Each semiannual report of monitoring deviations shall include summary information on the number, duration and cause of excursions and/or exceedances and the corrective actions taken. If there were no excursions and/or exceedances in the reporting period, then this report shall include a statement that there were no excursions and/or exceedances.

## **VIII. STACK/VENT RESTRICTIONS**

**DID NOT EVALUATE.** Did not evaluate stack heights at this time. The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted.

## **IX. OTHER REQUIREMENTS**

1. **DID NOT EVALUATE.** The permittee shall comply with all applicable requirements of 40 CFR Part 64.
2. **NOT APPLCAIBLE.** No failures have been identified. If the permittee identifies a failure to achieve compliance with an emission limitation or standard for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the permittee shall promptly notify the AQD and if necessary, submit a proposed modification of the CAM Plan to address the necessary monitoring changes. Such a modification may include but is not limited to, reestablishing indicator ranges or designated conditions, modifying the frequency of conducting monitoring and collecting data, or the monitoring of additional parameters.

.....  
**IN COMPLIANCE – Consent Order 33-2015**

Permit issuance date was December 3, 2015. According to the letter received on June 6, 2016, as of May 6, 2016, the equipment required by AQD CO 33-2015 and PTI 219-06B has been installed. This met the 150 day window. The required equipment was a pre-burner for the SCR system to heat the incoming exhaust air from the annealing furnace to at least the minimum temperature needed for the SCR system. The SCR system has been tested and shown to achieve compliance with the NOX emission rates so the CGL should be achieving said emission rates with proper maintenance. Maintenance records and temperature records were presented during the inspection. The next stack test is due in 2018.

From Consent Order 33-2015, the following is the compliance program and implementation schedule:

9. A. Permit 1. No later than April 30, 2016 or 150 days after the issuance of Permit to Install 219-06B, whichever is later, the NOx emissions from EG-CON-GALV-LINE shall not exceed the emission rates specified in the Company's ROP that is in effect.

B. Compliance Schedule 1. No later than April 30, 2016 or 150 days after the issuance of Permit to Install 219-06B, whichever is later, the Company shall have completed the installation of the appropriate equipment and notified the AQD Detroit District Supervisor in writing that the installation of the appropriate equipment has been completed and operation of the equipment has commenced in accordance with the provisions of Permit to Install 219-06B, as amended.

**Hot Strip Mill**

There is a 20% opacity limit on a 6-minute average. No visible emissions were observed from the hot strip mill during my inspection. Certified VE readings are required at least twice a year and are being conducted. Copies of some of the VE readings are attached. Annual reports required for ozone season have been submitted. Coke oven gas is no longer being combusted in the furnaces. **IN COMPLIANCE.**

**Hot Strip Mill Emergency Engines**

**IN COMPLIANCE**

The following engines are operating under PTI 19-16A, issued on July 1, 2016.

**EUEMERGEN4 A 2922 horsepower diesel-fueled emergency engine with a model year of 2006, and a displacement of less than 10 liters/cylinder. Ordered 11/7/2005, manufactured on 3/27/2006. Located by the 80" Hot Strip Mill (HSM) river pump house. August 2006 installation.**

**EUEMERGEN5 A 2922 horsepower diesel-fueled emergency engine with a model year of 2006, and a displacement of less than 10 liters/cylinder. Ordered 11/7/2005, manufactured on 5/12/2006. Located by the 80" Hot Strip Mill (HSM) river pump house. August 2006 installation.**

AQD performed a cursory review of the permit conditions related to these engines as most of the conditions are related to the NSPS IIII and RICE MACT ZZZZ for which AQD does not have delegation. However, based on the review, engines appear to be operating in compliance with the conditions:

- Facility reportedly purchased certified engines. Spec sheets with emission data and engine information were provided during the permitting process and are in the permit file. Based on the information in the exhaust emission data sheet, 2000DQKAB, the engines can meet the pollutant limits in the permit.
- Sulfur in fuel records were provided (attached) and facility is using ULSD.
- Run logs are maintained, USS needs to convert the information to a 12-month rolling basis but based on review it does not appear that the engines have exceeded 500 hours or 100 hours of operation per year.
- Permitted engine sizes appeared to match up with nameplate information.
- Non-resettable hour meters are in place and showed the following: 109 hours and 110 hours.
- Maintenance records were documented in the log book.
- Notification that the engines will be operated in a certified manner was required within 30 days. Letter was received on August 5 and dated July 29. I do not have the postmark date; discretion is being applied as it is very close to the July 31 deadline.

**Electro galvanizing**

The electro galvanizing line is no longer operating. Operations were transferred to the former Double Eagle Steel location on Miller Road that USS purchased. This includes the following emission units:

**EUEGL-OPERATIONS-S1, EUEGL-STO-TANKS-S1, and EUREACTOR-1-10-S1****EXEMPT EQUIPMENT**

75 HP diesel fire pump for P Bldg is 0.191 MMBTU/hr heat output and assuming 30 percent efficiency yields 0.6MMBTU/hr heat input. This meets the Rule 285(2)(g) exemption for a combustion engine less than 10 MM BTU/hr input. I informed USS that the engine may be subject to NSPS Part 60 Subpart IIII and the rule should be reviewed and the following information needs to be maintained: Documentation that the unit is a certified engine and meets the NSPS Part 60 Subpart IIII emission limits, records of each time the unit was started, why, and the hours of operation per calendar year, and sulfur content in the fuel. The facility needs to demonstrate that the unit has not operated more than 100 hours a year for non-emergency purposes. I cannot confirm that from the hour meter as it is at 227.4. If this is not available, it needs to be created moving forward.

165 HP diesel water pump for No 2 caster and a 205 HP diesel water pump for No. 2 caster is on site. The 205 hp engine converts to 0.522 MMBTU/hr output and assuming 30% efficiency yields 1.74 MMBTU/hr input. As such, both water pump engines are exempt per Rule 285(g). These units are older and most likely subject to the RICE MACT and the rule should be reviewed by USS and information such as the non-resettable hours meter reading, maintenance records including oil and filter changes, air cleaner inspections, hose and belt inspections, and diesel fuel supplier certification indicating sulfur content in fuel.

Note, some records were provided and are attached showing the sulfur content in the fuel used for all of the generators in ULSD, and there are scheduled maintenance tasks for the No. 2 caster generators and P building pump.

**NSPS/MACTS/NESHAPS**

The continuous galvanizing line and annealing furnaces are not subject to any NSPS or MACT standards.

The RICE MACT and/or NSPS III for the emergency engines is applicable and was discussed above.

**APPLICABLE FUGITIVE DUST CONTROL PLAN CONDITIONS**

Fugitive dust measures were not evaluated during this inspection. However, process specific fugitive dust is not an issue for these EU's.

**MAERS REPORT REVIEW**

The initial MAERS submittal for the CGL is incorrect and shows a permit to install exceedance. I asked the facility for an explanation. An old emission factor was used (from when the facility was not using the SCR at all times) and has been updated. MAERS was revised by the facility. See attached email explanation. The updated emissions matched the information provided during the inspection.

Engines/generators need to be added to the MAERS but are not going to be a significant source of emissions. This has been noted for next year.

Natural gas emission factors in use for the Hot Strip Mill are the EPA emission factors and are the same ones used in prior years.

**FINAL COMPLIANCE DETERMINATION**

At this time, the facility appears to be in compliance with the conditions evaluated in this report.

**Follow up**

Next stack test for the scrubber needs to be performed at the minimum flow the company wants to use moving forward.

NAME Kate Felt

DATE 7/14/17

SUPERVISOR W.M.