

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

B706136794

FACILITY: Gerdau MacSteel Monroe		SRN / ID: B7061
LOCATION: 3000 E FRONT STREET, MONROE		DISTRICT: Jackson
CITY: MONROE		COUNTY: MONROE
CONTACT: Craig Metzger , Environmental Manager - Monroe Mill		ACTIVITY DATE: 09/26/2016
STAFF: Eric Grinstern	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MAJOR
SUBJECT: Compliance Inspection		
RESOLVED COMPLAINTS:		

FACILITY DESCRIPTION

Gerdau MacSteel Monroe is located in Monroe County, in the Port of Monroe, in the City of Monroe. Gerdau acquired MacSteel from the Quanex Corporation in 2008. The facility has been a steel manufacturing operation since approximately 1978. The Monroe mill is part of Gerdau Special Steel North America, which is a subset of mills that produce special bar quality steel at three plants (Jackson, MI, Monroe, MI and Fort Smith, Ark.). In addition to the mills, Gerdau Special Steel North America includes processing plants in Michigan, Wisconsin, Indiana and Ohio.

Gerdau MacSteel is an electric arc steel making facility that operates one 140-ton capacity electric arc furnace, a ladle metallurgy station, two vacuum tank degassers, casting line, billet reheat furnace, rolling mill and finishing operations. The facility recently completed an extensive modification/upgrade to the plant. The modifications increased the mill's potential output from 740,000 tons of steel to 850,000 tons of steel per year.

REGULATORY OVERVIEW

The facility is a major source with processes covered under Renewable Operating Permit (ROP) No. MI-ROP-B7061-2009a, issued on August 28, 2009 as well as Permit to Install (PTI) No. 102-12A, issued on October 27, 2014 (revised on 7/27/2015 and 8/10/2015). PTI No. 102-12A addresses proposed modifications to the existing EAF, conversion of the ladle refining stations (LRS) to a ladle metallurgical station (LMF), installation of a new twin tank vacuum degasser (VTD), a new continuous caster, new slidegate heater, new cooling tower and a new walking beam billet reheat furnace. The proposed project under PTI No.102-12A was subjected to Prevention of Significant Deterioration (PSD) review.

The facility is considered an area source of hazardous air pollutants and is subject to the Area Sources Electric Arc Furnace Steelmaking Facility NESHAP, 40 CFR Part 63 Subpart YYYYY (Subpart YYYYY), issued on December 28, 2007. The EAF is also subject to NSPS 40 CFR Part 60 Subpart AAa, Standards of Performance for Steel Plants: Electric Arc Furnaces and AOD Vessels. The facility's ROP is in the Proposed stage of renewal, with issuance pending retesting to be conducted in October 2016.

COMPLIANCE EVALUATION

At the facility, AQD staff consisting of Eric Grinstern and Scott Miller met with Craig Metzger, Environmental Manger, Gerdau MacSteel. A copy of the "Environmental Inspections: Rights and Responsibilities" brochure was provided to the company.

Below is an evaluation of the compliance requirements for each regulated emission unit evaluated. Compliance is being assessed according to the structure of the Proposed ROP which incorporates the requirements of PTI No. 102-12A.

EUEAF

The electric arc furnace (EAF) melts steel scrap in a batch operation. The EAF is a refractory lined cylindrical vessel with a bowl-shaped hearth and dome shaped roof. Electrodes are lowered and raised through the furnace roof for melting the steel scrap. Six oxy-fuel burners are used to increase the steel melting rate. The molten steel is gravity fed from the EAF to the ladle used in the LMF by tapping at the bottom of the unit. The furnace has Direct Evacuation Control (DEC) from which emissions are ducted through a combustion chamber to allow for CO and VOC control, followed by a water quench system (sonic spray chamber for CO control) prior to baghouse control (DVBAGHOUSE-01). Fugitive emissions from the furnace are a captured by a roof canopy hood that ducts to DVBAGHOUSE-01. There are no

roof monitors in the portion of the building housing the EAF; therefore VE observations are made at the roof line.

Emission Limits/Testing/Recordkeeping

Restricts visible emissions to 3% for the EAF baghouse stack and 6% from the EAF Shop Building. PM emissions are restricted to 0.0052 gr/dscf. The VE and PM restrictions are based on the requirements of NSPS Subpart AAa. Additionally, the permit restricts VE from the openings and vents in the upper half of the EUEAF building portion of the facility to a six-minute average of 0 percent opacity during operation of the electric arc furnace.

A COMS unit is used to demonstrate ongoing compliance with the baghouse VE limit. Compliance with the EAF Shop Building and openings and vents of the upper half of EUEAF building is based upon daily VE observations. VE is also used as a surrogate to demonstrate continued compliance with the PM limit for 40 CFR Part 64 CAM. The VE limit of 3% from the baghouse is a NSPS Subpart AAa requirement, while the 6% from the melt shop is a NSPS Subpart AAa requirement as well as a Subpart YYYYY requirement.

For 2015 and 2016, the facility documented 48 instances in the first half of 2015 when the 6-minute opacity average exceeded 3%. The facility also reported a total of ten instances of excess opacity during the first half of 2016. The 2016 exceedances were attributed to the adding of baghouse coating to the bags.

The excess opacity that occurred during the first quarter of 2015 was address in a Violation Notice issued on July 7, 2015.

Process/Operational Restrictions

Requires that the permittee not melt any radioactive scrap metal in the electric arc furnace and that the permittee shall not transfer material to the LMF from the EAF without a ladle cover.

All incoming scrap passes through multiple radiation detection systems. On the day of the inspection a load of scrap was rejected for setting off the alarm. It was raining on the day of the inspection, which tends to results in an increase in alarms due to the sensitivity of the system.

The facility's operating procedures require the use of a ladle cover during transfer.

Design/Equipment Parameters

Requires the EAF to be equipped with the following:

CO and VOC reaction chamber, DEC canopy hood, quench system, baghouse, combustion controls, including real time process optimization (RTPO) and the oxy-fuel burners, transferring of liquid steel to the LMF ladles is accomplished by tapping the bottom of the unit, use of a COM to monitor VE from the EAF baghouse stack.

Based on this and previous inspections, the facility is in compliance with the above listed requirements.

Monitoring/Recordkeeping

Requires the operation of a COM unit on the EAF baghouse stack, requires VE observations of the roofline portion of the shop building containing the EAF on a daily basis.

The facility has installed and is operating a COM unit on the EAF baghouse stack.

The facility conducts and records daily VE observations for the roofline of the shop. The facility reported that they failed to conduct VE observations on 18 occasions during the first half of 2016. The facility has since resolved this issue through employee training. Review of a sampling of the 2016 VE observations contained in the Melt Shop Report showed no instances where VE was noted.

EUDUST-SILO

Emission unit includes the silo that stores dust collected by the baghouse (DVBAGHOUSE-01). The silo is controlled by a bin vent filter.

Emission Limits - Monitoring/Recordkeeping

Restricts PM emissions on a pound per hour and ton per year basis. The tpy limit is 0.8 tpy and the pph limit is 0.2.

Compliance with the emission limit is based upon the requirement to calculate emissions on a monthly and 12-month rolling time period. The emission calculations are based upon an established emission factor contained with the permit.

Review of requested records for the past 12-months showed compliance with the emission limits. Pounds per hour is set at 0.01 pph based upon control efficiency. The tpy for the previous 12 month period was 0.02 tons.

EUROADS&PKG-01

Facility Roadways, Parking area, Material Storage areas, Stockpile areas, Gerdau Monroe slag transferring and hauling operations, and material handling operations.

Emission Limits - Monitoring/Recordkeeping**Emission Limits / Process/Operational Restrictions/Monitoring/Recordkeeping**

Restricts opacity from the roadways and material storage piles to 5% opacity based on Method 9D. Compliance with the emission limit is based upon implementation of a fugitive dust program

The facility has a fugitive dust plan in place. No dust was observed from the roadways or storage piles during the inspection. It was raining intermittently during the day of the inspection.

The facility paved the South and North Roads on September 24, 2016.

The facility reported that they failed to record non-certified VE observations during yard activity on 12 days between January 1, 2016 and January 12, 2016.

The facility has since resolved this issue through employee training.

Review of a sampling of the Security Shift Reports, showed that the facility monitors fugitive dust on the roads and yard. The facility is implementing a new program addressing sweeping and wetting of road ways.

EUFLINN

Emission unit includes a 25 MMBtu/hr natural gas fired heat treat furnace.

Emission Limits - Monitoring/Recordkeeping

Restricts NOx emissions to 10.8 tons on a 12-month rolling time period basis.

Review of requested records for the past 12-months showed compliance with the emission limit of 10.8 tpy. The facility records showed the most recent 12 month period of NOx emissions to be 2.90 tons. The facility records also document monthly and 12 month natural gas usage.

The unit is only fired with natural gas and is not directly vented to the outside atmosphere. The Finn heat treat furnace is located adjacent to the other heat treat furnace (exempt from permitting) at the northwest end of the main building.

EULMF

The LMF is a complete ladle metallurgy system which includes arc reheating, alloy additions, powder injections and stirring. Emissions from EULMF are directed to DVLMFBAGHOUSE via removable covers or decks, which are located over the ladle while the process is operating.

Emission Limits

Restricts visible emissions to 5% for the LMF baghouse stack.

Process/Operational Restrictions

Requires that the DVLMFBAGHOUSE be installed and the permittee shall not transfer material to EUVTD from EULMF without a ladle cover.

Design/Equipment Parameters

Requires the LMF process vessel roof to be in the operational position for EULMF to be operated.

Compliance with the opacity limit is documented via the facility performing daily VE observations of the LMF baghouse stack. The facility conducts and records daily VE observations for the LMF baghouse stack. The facility reported that they failed to conduct VE observations on 18 occasions during the first half of 2016. The facility has since resolved this issue through employee training. Review of a sampling of the 2016 VE observations contained in the Melt Shop Report showed no instances where VE was noted.

The facility's operating procedures require the use of a LMF roof to be in operational position and the use of a ladle cover during transfer.

EUVTD

Two vacuum tank degassers which remove entrained gases from the molten metal. This emission unit does not include reheating. Controlled by the existing EAF baghouse. Emissions are directed to the DVBAGHOUSE-01 via removable covers or decks, which are located over the ladle while the process is operating.

Process/Operational Restrictions

Requires baghouse control and the process vessel roof be sealed.

The facility's operating procedures require the sealing of the process roof and the baghouse is installed and operating.

EUCASTER

Molten steel produced by the electric arc furnace is delivered to the continuous caster in a ladle via the ladle metallurgy system and twin tank vacuum degasser. The molten steel is gravity fed from the bottom of the ladle to the tundish enclosure. From the tundish, the molten steel flows into the enclosed caster strands. The semi-molten steel is then cut into billets by oxy-fuel cutting torches. The four cutting torches have a combined rated capacity of 4,413 cubic feet of natural gas per hour. EUCASTER also includes a 0.4 MMBtu/hour, natural-gas-fired, internally vented process heater that preheats the submerged entry nozzle (SEN) prior to it being inserted into the caster mold. Molten metal is added after the SEN is in place.

Material Limits/Recordkeeping

Restricts natural gas usage on a 12-month rolling time period basis to 36 MMSCF.

Design/Equipment Parameters

Requires the following:

The permittee shall not operate the cutting torches of EUCASTER unless the oxy-fuel burners are installed, maintained and operating properly.²

The combined maximum design heat input rate of the cutting torches of EUCASTER shall not exceed 4.5 million British thermal units per hour (MMBtu/hr.) on a fuel heat input basis.²

The maximum design heat input rate of the SEN process heater shall not exceed 0.4 million British thermal units per hour (MMBtu/hr) on a fuel heat input basis.²

The permittee shall not operate EUCASTER unless the liquid steel is tapped from the bottom of the ladle to the caster and sealed at the top of the caster.²

The permittee shall not operate EUCASTER unless the tundish is enclosed so that fugitive emissions do not occur from ladle tapping operations.²

Review of requested records for the past 12-months showed natural gas usage to be less than the permitted limit.

During previous inspections, bottom tapping ladles were observed along with the tundish being enclosed.

EUCASTERCOOLTWR

Emission unit includes the cooling tower associated with the new caster. Cooling tower for caster process water. Maximum water flow rate for cooling tower is 1,630 gallons per minute.

Emission Limits - Monitoring/Recordkeeping

Restricts the emission of PM and PM-10. Compliance with the emission limits is based upon proper operation of the high efficiency drift eliminator. The facility is also required to submit and maintain a MAP for the drift eliminator.

A MAP for the casting system as a whole has been submitted to the District.

EUBILLETREHEAT-WB

A walking beam billet reheat furnace equipped with Ultra-Low NOx burners with the total heat input capacity of 260.7 MMBtu/hr.

Emission Limits/Material Limits - Monitoring/Recordkeeping

Restricts the emission of VE, CO, NOx, VOC, and GHG as CO₂e.

Compliance with the emission limits is based upon performance testing (NOx and CO) and the requirement to calculate emissions on a monthly and 12-month rolling time period.

The facility conducted compliance testing on July 17, 2015, which showed an exceedance of the NOx limit. The facility addressed the cause and retested on April 27-28, 2016, at which time

compliance was demonstrated. A Violation Notice was issued on June 15, 2016, addressing the exceedance of the NOx limit.

Review of facility records for the past 12-month time period showed compliance with the emission limits for VOC, CO, NOx, and CO2e.

Compliance with the opacity limits, 5% during normal operation and 20% during startup, is verified by the requirement that the facility performs and maintain records of daily VE observations, including startup. Mr. Metzger stated that the facility conducts Method 9 readings any time the unit has a startup. Additionally, He stated that they have not observed any opacity out of the unit, during startup or routine operation. Review of a sampling of the 2016 VE observations contained in the Quad Mill Operations Note/Shift Report showed no instances where VE was observed.

Note: The billet reheat furnace was in operation during the inspection. No VE was observed from the stack at any time during the inspection.

Material Limits/Recordkeeping

Restricts natural gas usage on a 12-month rolling time period basis to 1,633 MMSCF.

Review of facility records for the past 12-month time period showed compliance with the natural gas usage limit.

EUGASTANK

This emission unit includes existing stationary gasoline dispensing facilities (GDFs) located at an area source of hazardous air pollutants (HAPs) that have a maximum monthly gasoline throughput of one of the following:

1. Less than 10,000 gallons

GDF means any stationary source which dispenses gasoline into the fuel tank of a motor vehicle, motor vehicle engine, nonroad vehicle, or nonroad engine, including a nonroad vehicle or nonroad engine use solely for competition. These facilities include, but are not limited to, facilities that dispense gasoline into on- and off-road, street, or highway motor vehicles, lawn equipment, boats, test engines, landscaping equipment, generators, pumps, and other gasoline-fueled engines and equipment

The facility has one 550 gallon on-site.

FGENGINES

One or more diesel fuel-fired reciprocating engine generators, including portable units, each with a maximum nameplate capacity of 5 megawatts (MW), used for power generation including emergency back-up and/or peak power shaving.

The facility currently has four engines onsite (heat treat, administration, rolling mill, pump house).

Emission Limits/Material Limits - Monitoring/Recordkeeping

Restricts the emission of NOx and limits diesel fuel usage to 136,000 gallons per 12-month period with annual sulfur content of 0.05 percent by weight on an annual average.

Compliance with the emission limits is based the requirement that the facility may be requested to conduct a performance test to verify the set emission rate of 515 pounds of NOx per 1000 gallons of fuel used. The facility is also required to maintain records of fuel usage on a monthly and 12-month rolling time period.

Review of facility records for the past 12-month time period showed compliance with the diesel fuel usage limit.

FGMELTSHOP

The Melt Shop includes the EUEAF, EULMF, and EUVTD

POLLUTION CONTROL EQUIPMENT:

DVBAGHOUSE-01 for the EAF and vacuum tank degassers, DEC for the EAF, CO and VOC reaction chamber for the EAF, and DVLMFBAGHOUSE for the LMF

Emission Limits/Material Limits - Monitoring/Recordkeeping

Restricts emission of PM, PM10, PM2.5, SO2, CO, NOx, Pb, VOC, GHG (CO2E), and Hg. Additionally, steel output is restricted to 130 tons per hour, based on a 24-hour average and 850,000 tons per year, based on a 12-month rolling time period.

Compliance is based upon the requirement to conduct emission testing within 180 days of achieving increased output capacity, and then every five years. Testing is required for PM, PM10, PM2.5, CO, NOx, VOC, SO2, Lead and CO2e. Compliance with the CO and SO2 emission limits is also based upon the use of CEMS. Mercury testing is required once per year for five years and then once every five years thereafter.

The facility installed the SO2 CEMS on July 28, 2015 in preparation for achieving the capacity to operate at an increased output, which was achieved on October 2, 2015. The SO2 CEMS showed an average emission rate of 0.21 pounds per ton of liquid steel. The emission rate was exceeding the existing ROP emission limit of 0.09 pounds per ton. A Violation Notice was issued on October 13, 2015 for the ROP SO2 violation. The SO2 emission rate stayed above 0.20 pounds per ton after the facility achieve the ability to operate at an increased capacity, at which time the PSD BACT established SO2 limit changed to 0.20 pounds per ton. A Violation Notice addressing this exceedance was issued on January 6, 2016. The facility installed a supersonic carbon injector and injected a coating on the baghouse bags to assist in SO2 removal. As a result the facility has been in compliance with the SO2 limit since February 1, 2016.

During the first quarter of 2015 the facility reported five instances where CO emissions were greater than the permitted 2.4 pounds per ton of steel melted, and one instance that the tons per day CO limit was exceeded. A Violation Notice addressing these exceedances was issued on July 7, 2015.

Performance testing to demonstrate compliance with the emission limits for PM, PM10, PM2.5, CO, NOx, VOC, SO2, Lead and CO2e was conducted on February 25-26, 2016.

The test results showed exceedances of the emission limits for PM10, PM2.5, NOx and VOC. A Violation Notice was issued on June 15, 2016, addressed the emission limit exceedances. The facility retested to demonstrate compliance with the emission limits exceeded. This testing was conducted on April 27/28, 2016. The test results showed exceedances for VOC, PM10 and PM2.5. However, upon review by TPU-AQD, the test was rejected due to an insufficient volume of gas collection for a valid test. The facility is scheduled to retest VOC, PM10 and PM2.5 on October 19-21, 2016.

Process/Operational Restrictions

Restricts the operation of each emission unit in FGMELTSHOP to an operating limit of 8,200 hours per 12-month rolling time period.

Review of the facility records for the previous 12-months documented compliance with the hours of operation limit.

Design/Equipment Parameters

Requires a device to monitor and record the SO2 and CO emissions and exhaust flow rate on a continuous basis, from the FGMELTSHOP (EAF) baghouse stack (SVBH-01-STACK).

The facility has installed SO₂ and CO CEMS units.

Monitoring/Recordkeeping

Requires the facility to maintain records of CEMS data for SO₂ and CO, monitor and records the 24-hour calendar day metal production rate, maintain monthly records of emissions and records of hours of operation.

The facility maintains the required CEMS records.

FGBLDGFUG

Processes located in the portion of the shop building that houses the EUCASTER, EULMF, and EUVTD, which vent fugitive emissions indoors that may escape the building through the roof monitor, as well as processes or activities other than EUEAF which are located in the portion of the shop building that houses EUEAF and which vent fugitive emissions that may escape through building vents. A portion of the plant ventilation that is vented through the ladle bay roof monitor is controlled by the LMF baghouse.

Emission Limits

Restricts visible emissions to 6% from EUCASTER as measured from the roof monitors of FGBLDGFUG.

Monitoring/Recordkeeping

Requires the facility to conduct daily VE observations to demonstrate compliance with the VE limit.

The facility conducts and documents the VE observations as part of the Melt Shop Report EAF Roofline observations. The facility reported that they failed to conduct VE observations on 18 occasions during the first half of 2016. The facility has since resolved this issue through employee training. Review of a sampling of the 2016 VE observations contained in the Melt Shop Report showed no instances where VE was noted.

FGGHG

The conditions of the flex group require a GHG emission limit, associated recordkeeping and an Energy Efficiency Management Plan.

Emission Limits / Monitoring/Recordkeeping

Restricts GHG as CO₂e to 294,201 tpy, based on 12-month rolling average.

Compliance with the emission limit is demonstrated by the requirement that the facility maintain monthly and 12-month rolling records of CO₂e emission rates.

Review the facility records for the previous 12-months showed compliance with the CO₂e limit.

Process/Operational Restrictions

Requires the facility to develop and submit an approvable Energy Efficiency Management Plan (EEMP) and a MAP for FGBLDFUG.

The facility has submitted the required EEMP and MAP.

FGMACT-YYYYY

The affected source is an existing electric arc furnace (EAF) steelmaking facility, which is (part of) an area source of hazardous air pollutant (HAP) emissions. The affected source is an EAF steelmaking facility as defined by 40 CFR Part 63 Subpart YYYYY.

The facility is considered an existing source under Subpart YYYYY and previously demonstrated compliance with the EAF emission limits. Upon completion of the furnace modifications, retesting was

required to be completed within 180 days of startup.

Emission Limits

The EAF is subject to a PM emission limit of 0.0052 gr/dscf and the melt shop (which is the fugitive emissions from the EAF for this facility is subject to an opacity limit of 6%.

The facility conducted testing in March 2008, at which time compliance was demonstrated.

After completion of the furnace modifications the facility retested and demonstrated compliance with the PM and VE emission limits on February 25/26, 2016.

Material Limits/Process

Contaminants in scrap other than mercury:

Requires metallic scrap charged to the EAF to comply with either the Pollution Prevention Plan option regarding selection and inspection to minimize contaminants or Restricted Metallic Scrap option described in Subpart YYYYYY.

For mercury:

Requires the facility to participate in and only receive motor vehicle scrap from providers who are participating in a USEPA-approved program (NVMSRP) or to develop a site- specific plan for receipt of scrap from non NVMSRP participants.

Contaminants other than mercury:

The facility is operating under an approved plan in accordance with Subpart YYYYYY. The plan addresses the use of scrap under the selection and inspection option as well as Restricted Metallic Scrap. The facility inspects and maintains records of each load of incoming scrap. The facility's scrap plan addresses actions to be taken if a non-conforming scrap is brought onsite.

Mercury

The facility's plan addresses participation in the approved program option (NVMSRP), as well as a site specific plan. The facility maintains records of all scrap providers participation in NVMSRP and verifies compliance through onsite inspections of providers as well as verifying participation in the ELVS program semi-annually.

In 2009 the facility's scrap management plan was revised to include site specific requirements to address the receipt of scrap from two Canadian suppliers that participate in Switch Out, the Canadian version of NVMSRP. The facility has not received any scrap from Canada in the second half of 2015 or 2016.

FGNSPS-SI-ICE

This table contains requirements of the New Source Performance Standards for Stationary Spark Ignition - Internal Combustion Engines, 40 CFR Part 60, Subpart JJJJ for spark ignition (SI, i.e natural gas/propane) emergency generators.

The facility has one natural gas unit fired generator under this flex group, EUADMININGEN.

FGMACT-ZZZZ-EMERGENCY RICE

Each existing emergency stationary reciprocating internal combustion engines (RICE) as identified within 40 CFR Part 63, Subpart ZZZZ, 40 CFR 63.6590(a)(1), and is exempt from the requirements of Rule

201 pursuant to Rules 282(b) or 285(g)

The facility has two diesel-fired generators under this flex group, EUFININSHING, EUMAINPUMPHOUSEGEN.

FGRULE290 & FGCOLDCLEANERS

FGRULE290 contains emission units EUPAINING, EUTURNER and EUMILLBH. EUPAINING addresses color coating the ends of the steel bar, EUTURNER addresses the use of a rust inhibitor and EUMILLBH addresses sawing.

The facility maintains records documenting compliance with Rule 290.

FGCOLDCLEANERS addresses 10-11 cold cleaners onsite. No lids were observed open on any cold cleaners during the inspection. The facility has a company that services the units.

CONCLUSION

The facility is considered to be noncompliant since they have not demonstrated compliance with the emission limits for VOC, PM10 and PM2.5 from FGMELTSHOP.

The Violation Notices issued for emission exceedances associated with FGMELTSHOP and EUBILLETREHEAT-WB are being addressed through enforcement action taken by AQD that will likely be resolved through a consent order.

NAME


Eric Greenstein

DATE

9/29/16

SUPERVISOR

