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

B430643624

FACILITY: Gerdau Special Steel North America - Jackson Mill		**SRN / ID:** B4306
LOCATION: 3100 BROOKLYN RD, JACKSON		**DISTRICT:** Jackson
CITY: JACKSON		**COUNTY:** JACKSON
CONTACT: Craig Metzger , Regional Environmental Manager		**ACTIVITY DATE:** 01/24/2018
STAFF: Mike Kovalchick	**COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Inspection of Gerdau and adjacent TMI International Corporation slag handling facility.		
RESOLVED COMPLAINTS:		

Major / ROP Source. Full Compliance Evaluation (FCE) and Inspection (PCE)

Facility Contacts

Patrick Buckley, Planning-Building & Grounds, 517-206-7892 patrick.buckley@gerdau.com

Craig Metzger, Regional Environmental Manager, 734-818-7113. Craig.metzger@gerdau.com

Michael Connolly-Director Environmental Engineering, TMS International 1155 Business Center Drive, Horsham, PA 19044-3454, 215-956-5618 MConnolly@tmsinternational.com

Purpose

On January 24, 2018, I conducted a scheduled, unannounced inspection of the Gerdau Special Steel North America - Jackson Mill (GJ) facility located in Jackson, Michigan (Jackson County) at 3100 Brooklyn Road. Zach Durham (ZD), Jackson District EQA, also joined me for this inspection. (Note: TMS International's slag handling facility located on GJ's property was also inspected.) The purpose of the inspection was to determine the facility's compliance status with applicable federal and state air pollution regulations, particularly Michigan Act 451, Part 55, Air Pollution Control Act and administrative rules, and the conditions of GJ's Renewable Operating Permit (ROP) number MI-ROP-B4306-2015, issued February 12, 2015. This facility was last inspected on July 28, 2016 and found to be in compliance.

Facility Location

Several residential and commercial properties, including a preschool, are located about 1,000 feet south and southeast of the facility, while US-127 and open / agricultural fields are located west and north, respectively, of the facility. See attached aerial photo.

Arrival & Facility Contacts

No visible emissions or odors were observed upon our arrival and parking at the facility, at approximately 9:00 am. We proceeded to the facility security office to request access for an inspection of the facility. Craig Metzger (CM) was not at the facility but was able to speak with him on the phone. He coordinated our visit with Patrick Buckley (PB) who is with Gerdau's Planning Department. I told Craig the purpose of the visit which was to take a tour of the facility to become familiar with the operations since we had not been to the facility, to discuss their torch cutting operation, and get an update the status of NOV that EPA had written on September 12, 2014 for violations uncovered during a August 15, 2012 inspection.

Regulatory Applicability

The facility is a Major / ROP source for CO and had also accepted PM, NOx, SO2, CO, and VOC emission limits in order to remain below major source emission thresholds for these pollutants. The facility is regulated by ROP number MI-ROP-B406-2015. It is also subject to:

- Title 40 of the Code of Federal Regulations (CFR), Part 63, Subpart YYYYY (5Y), National Emission Standards for Hazardous Air Pollutants (NESHAP) for Electric Arc Furnace (EAF) Steelmaking Facilities. This MACT includes requirements to limit mercury and other contaminants in the steel scrap, and a PM and PM10 emission limit of 0.0052 gr/dscf of exhaust gases and 6 % opacity limit for the facility's electric arc furnaces (EAFs).

· Title 40 of the CFR, Part 63, Subpart ZZZZ, NESHAP for Reciprocating Internal Combustion Engines (RICE) (AKA RICE MACT).

· Title 40 of the CFR, Part 64, Compliance Assurance Monitoring (CAM), with the following CAM monitoring parameters for FG-EAF/LMF/VAD: VE readings, baghouse (BH) pressure drop monitoring, and BH inspection and maintenance activities.

The facility reports its emissions to MAERS and is designated as a Fee Category I source.

Emission Unit (EU) / Flexible Group (FG) Details

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EU-HTOV001	30 MMBTU/hr natural gas fired heat treat furnace PTI 24-06	7/1/1981	FG-FACILITY
EU-ROOFMONITOR	This emission unit is comprised of the melt shop roof monitor. The roof monitor is a covered vent at the apex of the roof line of the melt shop. The emissions emitted from the roof monitor are fugitive emissions that escape the roof canopies. PTI 535-96I	1/1/1973	FG-SHOP
EU-AF01	60.2 MMBTU/hr annealing furnace #1 PTI 183-01	9/8/2001	FG-FACILITY
EU-AF02	38.4 MMBTU/hr annealing furnace #2 PTI 183-01	9/25/2001	FG-FACILITY
EU-EAF-01	Electric arc furnace (EAF #1) melts scrap iron in a batch process. It is a refractory-lined cylindrical vessel with bowl shaped hearth and dome-shaped movable roof. The EAF emissions are ducted to a common baghouse (Baghouse No. 3)	1/1/1973	FG-EAF FG-EAF/LMF/VAD FG-SHOP FG-FACILITY
EU-EAF-02	Electric arc furnace (EAF #2) melts scrap iron in a batch process. It is a refractory-lined cylindrical vessel with bowl shaped hearth and dome-shaped movable roof. The EAF emissions are ducted to a common baghouse (Baghouse No. 3).	1/1/1973	FG-EAF FG-EAF/LMF/VAD FG-SHOP FG-FACILITY
EU-LMF	A ladle metallurgy furnace (LMF). Exhaust gases from the LMF are captured by the removable hood and associated canopy hoods and then routed to the melt shop baghouse. (DV-BH03) for PM emission control.	7/7/1989	FG-EAF/LMF/VAD FG-SHOP FG-FACILITY
EU-VAD	A vacuum arc degasser (VAD). Exhaust gases from the VAD are captured by the close fitting hood at the vacuum chamber door and associated canopy hoods and then routed to the melt shop baghouse (DV-BH03) for PM emission control.	7/7/1989	FG-EAF/LMF/VAD FG-SHOP FG-FACILITY
EU-binfilter	This device is a small baghouse atop a silo. Its use is to prevent fugitive emissions from escaping the silo, which stores EAF dust.	3/1/1998	FG-FACILITY
EU-limeBH	This is a small baghouse attached to the lime system. Its purpose is to collect fugitive emissions during lime system operation. It operates about 2 hours per day.	6/1/1999	FG-FACILITY
EU-COLDCLEANERS	Seventeen (17) cold cleaners	11/26/13	FG-FACILITY
EU-ENGINE1	Existing Emergency Compression Ignition Generator < 500 HP (Clean 1 West)	June 1984	FG-RICE
EU-ENGINE2	Existing Emergency Compression Ignition Generator <500 HP (Clean 1 East)	5/23/1997	FG-RICE

EU-ENGINE3	Existing Emergency Compression Ignition Generator < 500 HP (Turn Office)	Before 7/11/2005	FG-RICE
EU-ENGINE4	Existing Emergency Compression Ignition Generator >500 HP. (New Heat Treat)	2001	FG-RICE
EU-ENGINE5	Existing Emergency Spark Ignition Engine < 500 HP (Outside #1 STR)	7/14/1998	FG-RICE
EU-ENGINE6	Existing Emergency Spark Ignition Engine <500 HP (Admin Bldg.)	6/8/2006	FG-RICE

FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FG-EAF	Two (2) Electric Arc Furnaces	EU-EAF-01 and EU-EAF-02
FG-EAF/LMF/VAD	Two (2) Electric Arc Furnaces, a ladle metallurgy furnace (LMF), and a vacuum arc degasser (VAD).	EU-EAF-01, EU-EAF-02, EU-LMF and EU-VAD
FG-SHOP (Roof Monitor)	The shop roof monitor is above the EU-EAF-01, EU-EAF-02, EU-LMF, and EU-VAD. Fugitive emissions from all of these processes are emitted through the shop roof monitor.	EU-ROOFMONITOR, EU-EAF-01, EU-EAF-02, EU-LMF and EU-VAD
FG-FACILITY	All equipment at the facility including the FG-EAF, FG-EAF/LMF/VAD and the equipment covered by other permits, grand-fathered equipment and exempt equipment.	EU-EAF-01, EU-EAF-02, EU-LMF, EU-VAD, EU-HTOV001,EU-ROOFMONITOR, EU-AF01, EU-AF02, EU-binfilter, EU-limeBH, and EU-COLDCLEANERS
FG-RICE	Four (4) Compression Ignition Emergency Generators and Two (2) Spark Ignition Emergency Generators subject to the RICE MACT Requirements	EU-ENGINE1, EU-ENGINE2, EU-ENGINE3, EU-ENGINE4, EU-ENGINE5, EU-ENGINE6

Facility Background and Pre-Inspection Meeting

GJ is a Secondary Steel Producer (Mini-Mill) that employees about 400 persons. The melt shop operates 5 to 6 days a week, while the finishing shop operates 7 days a week. Typically, production occurs over three, 8-hour shifts. A heat typically lasts about an hour, and under normal operations, GJ can achieve 24-26 heats per day. A "heat" refers to a batch of molten steel. In addition, "tap-to-tap" is used to define the start and end of a heat, which includes furnace charging, melting, refining, de-slagging, tapping (pouring of the molten steel to a ladle, etc.), and furnace turn-around. The facility primarily produces small bar steel having a diameter between 0.9 to 4.25 inches.

Scrap is selected from the various piles found in the facility's scrap yard and is loaded in a charge bucket. The charge bucket's bottom opens to load 1 of the 2 EAFs with cold steel and the melting phase begins once the operator strikes an arc on the scrap as the EAF electrodes are lowered into the furnace. The furnace is charged again with additional cold steel. The EAFs alternate operations, as only 1 EAF is charged at one time.

Once the molten steel is to spec, tapping occurs when the EAF is tilted and the steel pours into a ladle to transfer the molten steel to the ladle metallurgy furnace (LMF) for additional fine refining / secondary addition of alloys, and then to the vacuum arc degasser (VAD) for the injection of argon to stir the molten steel for additional refinement and removal of entrained gases using a steam vacuum system. Emissions from the EAFs, the LMF, and VAD are controlled by a positive pressure baghouse (DV-BH03).

Next, the 50-ton ladle is transported to the caster area. A 2 strand tundish feeds molten steel to a continuous caster. A conveyer transports the molten steel strands to a walking beam furnace for reheat. Then the strands go through 6 roughing mills, which slowly round out the strands. The finishing mills conduct additional rolling and fine adjusting, prior to being cut. The finishing department then polishes, inspects, and conducts heat treatment in the facility's annealing furnaces. The final product is banded and shipped offsite.

FG-EAF/LMF/VAD has a less than 6% opacity limit, except for one 6-minute average of not more than 10%, per SC III.1 and a 6% opacity limit at the FG-Shop (Roof Monitor), per SC III.1. This roof monitor is sealed and readings are taken at the baghouse. The casting roof monitor is limited to a 20% opacity limit, per GC 11.

GJ reported the following, facility-wide total emissions for 2017: 517 tons CO, 71.76 tons NOx, 15.19 tons PM10, 28 tons S02, and 18 tons VOC. The facility reported emissions using CEMS, stack testing, and MAERS EFs. GJ's ROP does not specify facility-wide emission limits, but for comparisons, FG-EAF/LMF/VAD have the following limits, 280 tons per year (tpy) for SO2, 148.4 tpy for NOx, 1,400 tpy for CO, and 84 tpy for VOC.

Summary of the reporting / submittal requirements and include the follow items listed below.

- Annual MAERS report.

- Annual and Semi-Annual ROP Certifications, per ROP requirements. Recent deviations, with additional comments available on the FCE report, include: Records for daily non-Method 9 reading were not taken for 1 day, per FG-SHOP SC VI.2 and no records were produced for daily preventative maintenance work on the baghouse for one day, per FG-Facility SC III.1.

- Quarterly EAF baghouse dust analysis, per FG-EAF/LMF/VAD SC VI.2.

- Quarterly Continuous Emission Monitoring System (CEMs) Excessive Emissions Reports (EER), per ROP Appendix 3. The facility measures SO2 and CO emissions using CERMS, per ROP requirements.

- Semiannual mercury compliance reporting, per subpart YYYYY requirements.

- Stack testing test plan: every 5 years.

We then discussed US EPA's recent issuance of a Finding of Violation (FOV). See Attachment (1). The FOV was issued due to US EPA's observance of the EAF's (located on the south side of the building) emission migration to the caster area (located on the northern side of the building). These EAF emissions are regulated with an opacity limit of less than 6%, taken at the baghouse (DV-BH03), while the caster roof monitor is regulated at a 20% opacity limit. The FG-SHOP (Roof Monitor) was sealed up and now opacity readings are taken at the baghouse. GJ's focus was on maximizing EAF emission capture and minimizing drift to the caster area, but it becomes difficult under certain wind patterns. CM indicated that GJ has reached a tentative agreement with EPA and they expect to sign a settlement agreement in April, 2018. It will involve the installation of a new $5 million dollar baghouse to provide complete control of the roof monitor in addition to the existing baghouse. I recommended to CM that he should setup a pre-application PTI meeting with AQD Permits Section in Lansing for the new dust collector and related changes. I noted that the new PTI will be rolled into the ROP and conditions related to the new dust collector will become permanently enforceable under the ROP; a requirement of EPA.

I discussed GJ's torch cutting operation with CM and noted that there is no longer an existing permit exemption for uncontrolled torch cutting outdoors. CM indicated that he would have PB show us the torch cutting operation.

Onsite Inspection Narrative

PB gave us a tour of most of the facility. See attached photos.

We first observed the EAFs. The FG-SHOP (Roof Monitor) is sealed / closed and all VE readings are taken at the baghouse. VE readings are done at least once daily, especially while charging at the baghouse, per FG-SHOP SC VI. 2.

Most of the emissions were captured by the overhead canopy. GJ operates 2 individual EAFs with a 50-ton capacity. Each is equipped with 3 electrodes and additional oxy-fuel burners. Scrap is charged 2 times per heat. GJ does alternate the front (1st) and the back (2nd) charge. We then observed the LMF, followed by the

VAD. A ladle is transported by an overhead crane from the EAF to the LMF, then to the VAD, and finally to the caster and the caster roof monitor.

Next, we went outside to observe the torch cutting area. There appeared to be 3 separate torch cutting stations; each station equipped with multiple torches. There was a both a large pile of off-spec steel rods that were waiting to be torched and metal that had already been torched. PB explained that the steel needs to be cut into 4-foot sections so that he can be placed back in the ladle to be re-heated. They were not torching during the plant tour but PB explained that torching is done daily.

Next, we observed the baghouse duct work and no VE were observed. Behind the baghouse, the facility operates equipment to crush slag into smaller pieces that is sold. This facility is owned and operated by TMS International although it is on GJ's property. We observed VE from the equipment and piles of crushed slag. Most of the VE was from losses from conveyors dropping to material piles below being caught in the wind. Next, we observed the facility's positive pressure baghouse (DV-BH03). It is a positive pressure baghouse which places a fan in-duct prior to the baghouse compartments, where the actual bags are located. Prior to the fan's location, the ductwork is under negative pressure, while the baghouse compartment is under positive pressure. Operation of the baghouse is required for FG-EAF/LMF/VAD's operation, per SC IV.1 and to comply with NESHAP Subpart YYYYY PM emission limits (SCs I.1 and I.3). There was no collected dust spilled on the ground near the baghouse.

Post-Inspection Meeting

We returned to PB's office and held a brief post-inspection meeting. I gave PB a list of documents that I requested that I need to review to show compliance with their ROP. See Attachment (2). PB indicated that he would pass the request on CM and have the documents to me in a couple of weeks.

I indicated that I had concerns about the torch cutting and the slag handling operations and would return soon to look more closely at these operations.

We thanked PB for his cooperation and assistance and departed the facility at approximately 11:30 am.

Recordkeeping Review

Below is a summary of the records I requested, as specified by the following permit SCs or records requested to demonstrate compliance with a specific SC for the period of July 2015 through June 2016.

EU or FG Designation	Record Request per Permit SC(s) for 2017.	Comments (if applicable)	Substantial Compliance (Yes or No) / Comments
HTOV 001 (Old Salem Furnace-30 MM BTU Heat Treat)	VI.1	Requested to demonstrate compliance with SC I.1, 18.4 tons, per 12-month rolling time period, NOx emission limit.	Yes / See Attachment (3). 6.2 tons, highest 12-month rolling NOx emissions reported for December 2017.
EU-AF01	VI.1	Also requested to demonstrate compliance with natural gas material usage limits of less than 527 million cubic feet per 12 month rolling time period, per SC II.1 and less than 0.06 million cubic feet per hour, based on 24-hour averaging period, per SC II.2.	Yes / See Attachment (4). 164.27 MMCF, highest 12-month rolling natural gas usage reported for Jan 2017. Daily natural gas usage below 0.06 million cubic feet per hour limit.
			Yes /

		time period NOx emissions limit, and SC I.3, 20 tons, per 12-month rolling time period CO emissions limit.	for January 2017. 0.57 tons, highest 12-month rolling CO emissions reported for April 2017.
EU-AF02	VI.1	Also requested to demonstrate compliance with natural gas material usage limits of less than 336 million cubic feet per 12 month rolling time period, per SC II.1 and less than 0.038 million cubic feet per hour, based on 24-hour averaging period, per SC II.2.	Yes / See Attachment (4) & (5) 65.74 MMCF, highest 12-month rolling natural gas usage reported for June 2017. Daily natural gas usage below 0.038 million cubic feet per hour limit.
	VI.2	Requested to also demonstrate compliance with SC I.1, 3.12 pounds per hour, based upon a 24-hour averaging period, NOx emission limit, SC I.2, 13.9 tons, per 12-month rolling time period NOx emissions limit, and SC I.3, 15 tons, per 12-month rolling time period CO emissions limit.	Yes / See Attachment (4) & (5). Daily NOx emissions are below the 3.12 pounds per hour. 2.70 tons, highest 12-month rolling NOx emissions reported for June 2017. 2.5 tons, highest 12-month rolling CO emissions reported for June 2017.
FG-EAF	VI.2	Requested to also demonstrate compliance with SC II.1, 1,920 tons of scrap steel charged to FG-EAF material usage limit, calculated per calendar day as determined at the end of each calendar month and with SC II.2, 560,000 tons of scrap steel charged to FG-EAF material usage limit, calculated per 12-month rolling time period as determined at the end of each calendar month.	Yes / See Attachment (6) which shows daily charge and CO/SO2 emissions. Daily scrap steel charged to FG-EAF below 1,920 tons, with a 1352 tons / day reported highest for March 23, 2017. 281,447 tons, Highest 12-month rolling scrap steel usage reported in September 2017.
	VI.1	Amount of manganese added.	Yes / See Attachment (7)
	VI.2 and VI.6		Yes / Records reviewed upon quarterly receipt and included in the facility's file.

FG-EAF/LMF/VAD	VI.7		Yes / Daily preventative maintenance records were observed during the onsite inspection.
	VI.8	Also requested to demonstrate compliance with SC I.5, 1.0 pound SO2 / ton steel emissions limit, based on a daily average, SC 1.6, 280 tpy SO2 emission limit, based on a 12-month rolling time period, and SC I.10, 1,400 tpy CO emission limit, based on a 12-month rolling time period.	Yes See Attachment (6) and Attachment (8) 51.05 tons, highest 12-month rolling SO2 emissions reported for March, 2017. 539.08 tons, highest 12-month rolling CO emissions reported for December, 2017.
	VI.9	Requested to also demonstrate compliance with SC 1.8, 148.4 tpy NOx emission limit, based on a 12-month rolling time period, SC I.12, 84 tpy VOC emission limit, based on a 12-month rolling time period, SC I.16, 2.8 tpy Mn emission limit, based on a 12-month rolling time period, and SC I.18, 0.069 tpy Hg emission limit, based on a 12-month rolling time period.	Yes See Attachment (8) & (9). 39 tons, highest 12-month rolling NOx emissions reported for September 2017. 15.48 tons, highest 12-month rolling VOC emissions reported for September 2017. 0.1267 tons, highest 12-month rolling Mn emissions reported for September 2017. 0.0115 tons, highest 12-month rolling Hg emissions reported for September 2017.
	VI.11	Material Management Plan.	Yes / See Attachment (10).
	V.12		Yes See Attachment (11) which is a partial printout of baghouse/opacity related information. Baghouse pressure data were within the CAM limits of 2.5 through 15 inches of water.
	IX.1 through IX.7	CAM Requirements	Yes / Reviewed other permit and recordkeeping requirements regarding VE readings and, baghouse pressure drop and inspection and maintenance activities. CAM assurance plan is Attachment (12).

FG-SHOP (ROOF Monitor)	VI.2		Yes / Daily VE readings are conducted as apart of daily preventative maintenance activities. See Attachment (11).
	VI.3		Yes / See Attachment (11).
FG-RICE	VI.1.b		Yes / Documents not requested.
	VI.1.d		Yes / Documents not requested.
	VI.1.e		Yes / Documents not requested
	VI.1.f		Yes / See Attachment (13).
Fugitive Dust Control			Yes / See Attachment (14).

Attachment (15) are baghouse dust samples results for Pb, Mn, and Hg. No trend noted in 2017.

Attachment (16) is the Continuous Emissions Monitoring Plan for EAF/LMF/VAD Baghouse. CEMS will be further reviewed during scheduled inspection later in 2018.

Attachment (17) is the Statup, Shutdown, Malfunction Plan for the facility.

Attachment (18) is the Malfunction Abatement Plan for Electric Arc Furnaces, Ladle Metallurgy Furnace and Vacuum Arc Degassing.

Attachment (19) is the Pollution Prevention Plan for the Control of Contaminants in Scrap.

Attachment (20) is Rule 290 demonstration provided by TMI Corporation for their slag handling

operation. It wasn't clear from the diagram provided in the demonstration whether the process contains crushers or not. They used emission factors that were based on crushed stone processing and pulverized mineral processing. Slag is neither. Also, the demonstration didn't look at air toxics such as manganese oxide compounds, and other trace metals compounds like thallium, chromium, vanadium, cadmium, lead, and nickel. Depending on the specific compound, the TMI would need to show that either the toxic compound isn't present or that it is being emitted less than 20 pounds per month in order to be eligible to use Rule 290 to be exempt from PTI requirements. Furthermore, there is no fugitive dust plan in place to minimize particulate emissions and significant opacity was noted during the inspection. This process is in violation of Rule 201-No Permit to Install.

Attachment (21) is a table that shows typical metal concentrations found in steel slag from electric air furnaces such as those mentioned in previous paragraph.

Attachment (22) is a process flow diagram for GJ.

Compliance Summary

Based upon the visual observations and the review of the records, GJ appears to be in substantial compliance with the requirements of their ROP. Throughout the entire onsite inspection and subsequent recordkeeping review, the staff of GJ extended their full cooperation. However, there are two outstanding compliance issues.

- Torch Cutting operation may not be in compliance with 20% opacity and Rule 201. This issue will be revisited during an upcoming scheduled inspection when the torch cutting operation is active.

- Slag handling operation needs to be included in upcoming ROP renewal. It may need to be added as a separate section of the ROP.

Furthermore, the slag handling operation that is owned/operated by TMI International is in violation of Rule 201-No Permit to Install. A Violation Notice will be sent to TMI and they will be given 21 days to respond.

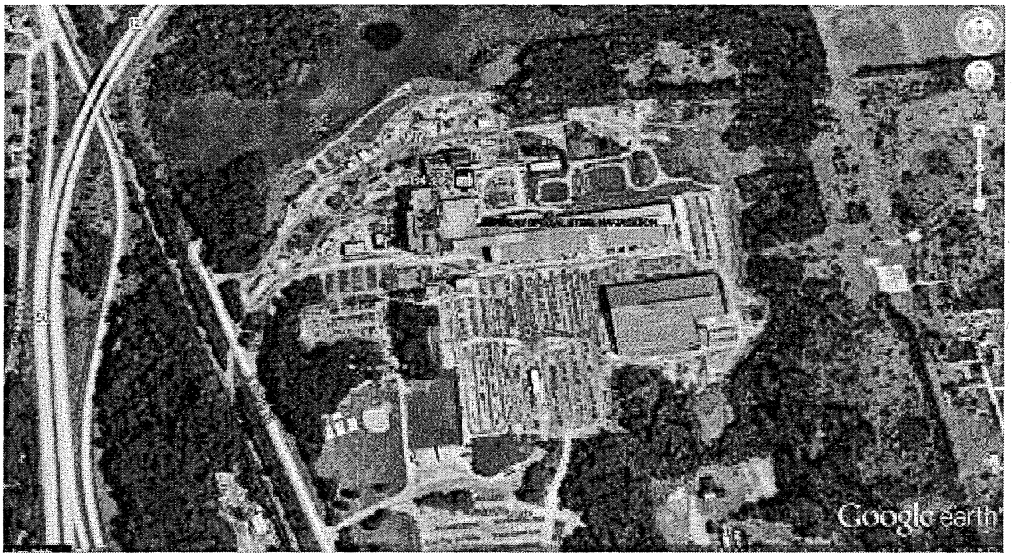

Image 1(Aerial image) : Aerial image

Image 2(EAF) : Looks towards EAFs from behind window.

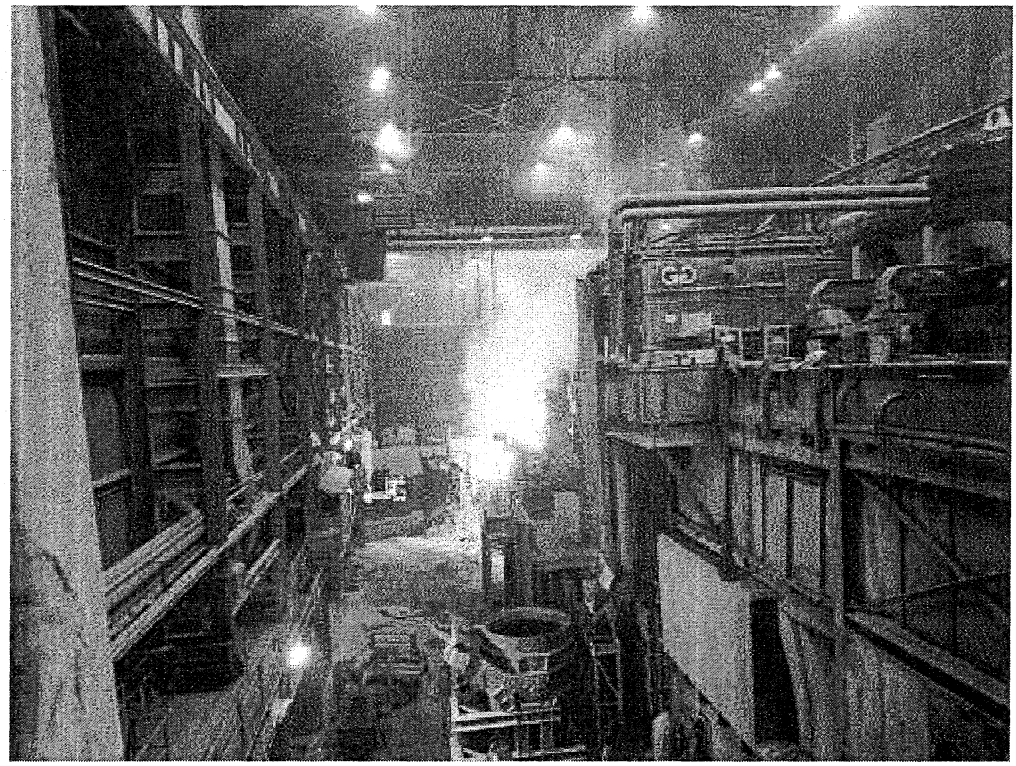

Image 3(EAF) : Distant view of ladle pouring.

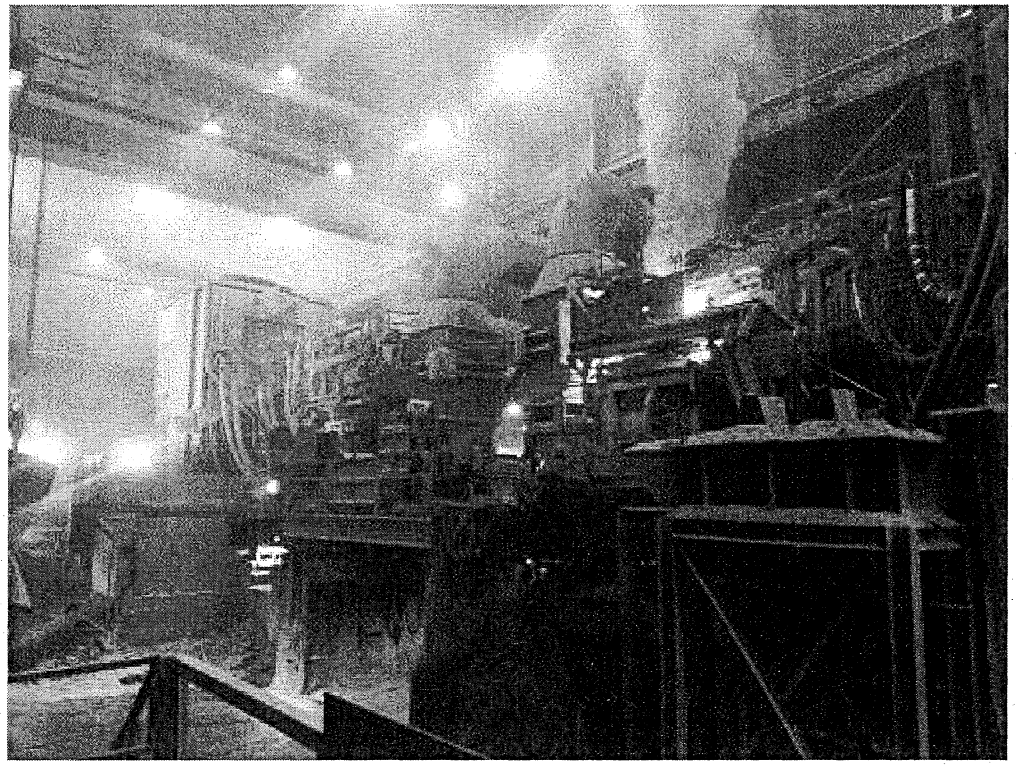

Image 4(Smoke EAF) : Smoke EAF

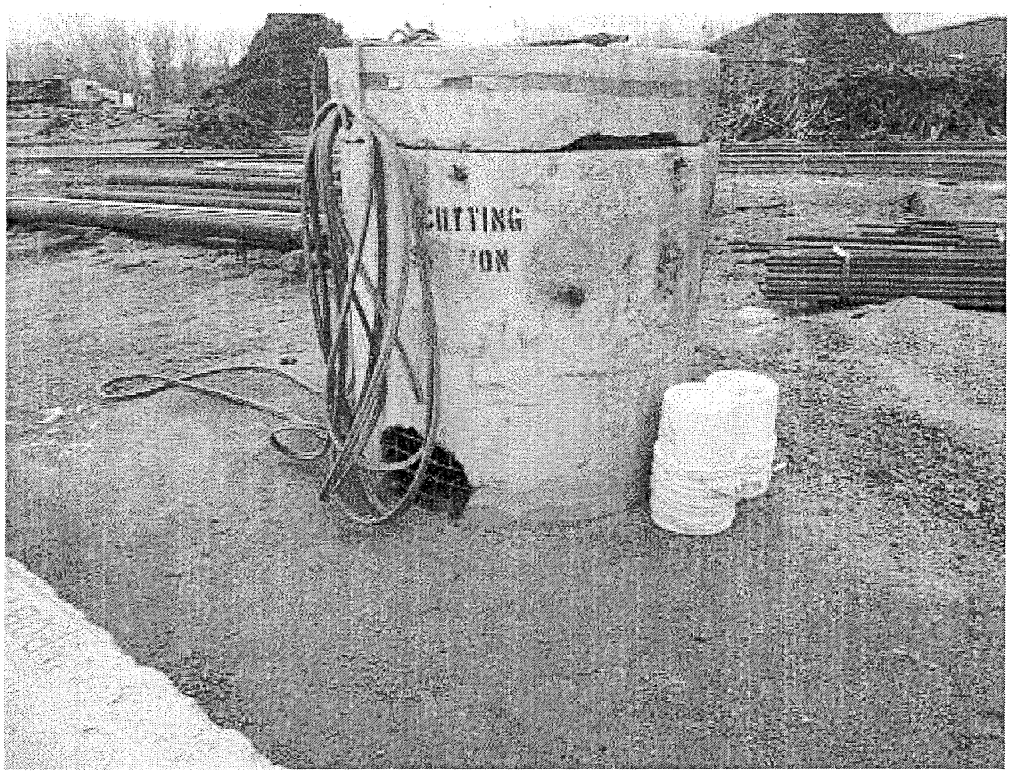

Image 5(Torch Cutting) : One of three torch cutting stations.

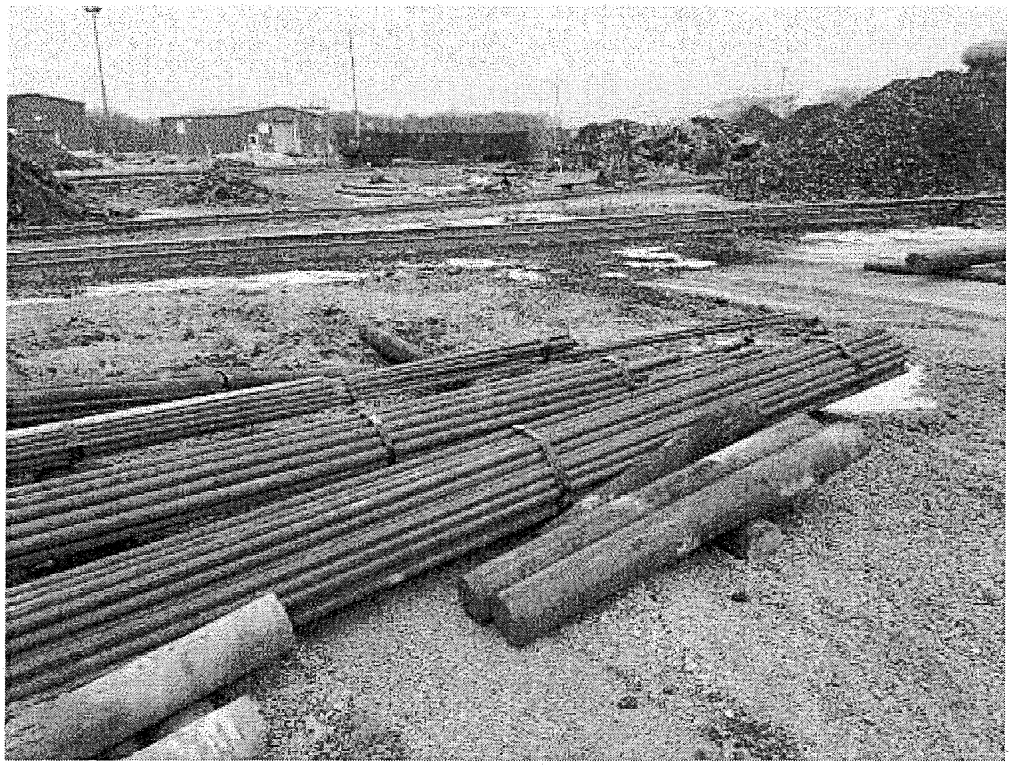

Image 6(Torch Cutting) : Recycled material ready to be torch cut.

Image 7(Torch Cutting) : Material already cut via torch cutting.

Image 8(Baghouse ducts) : Ducts to Baghouse

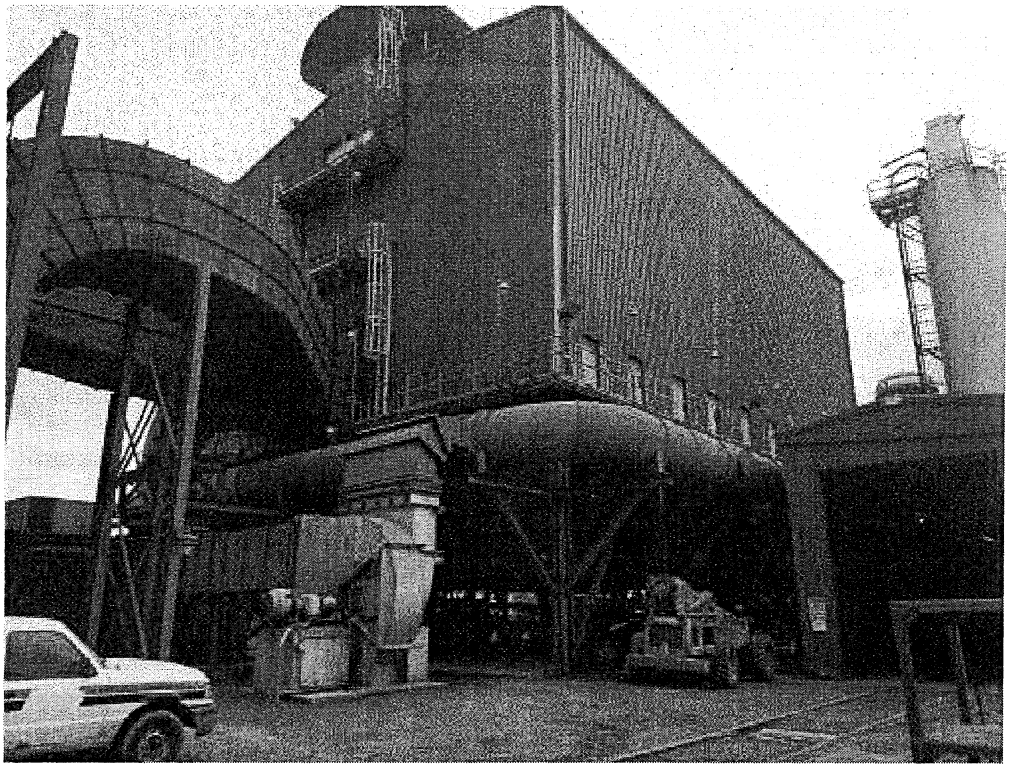

Image 9(Main baghouse) : Main baghouse

Image 10(Slag handling) : Slag handling facility.

NAME M. Kovalchuck DATE 3/13/2018 SUPERVISOR