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

B175449791

FACILITY: Ervin Amasteel Division		**SRN / ID:** B1754
LOCATION: 915 TABOR ST., ADRIAN		**DISTRICT:** Jackson
CITY: ADRIAN		**COUNTY:** LENAWEE
CONTACT: Richard Payne , Plant Engineer		**ACTIVITY DATE:** 08/01/2019
STAFF: Mike Kovalchick	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: FCE of a secondary steel mill. The facility is in compliance.		
RESOLVED COMPLAINTS:		

Major Source for CO-Area Source for HAPs-Full Compliance Evaluation (FCE)

Facility Contact

Richard (Rick) Payne III: Plant Engineer ph: 517-265-6118 ext. 117

rpayne@ervinindustries.com

John Gramm: Plant Manager ph 517-265-6118

Purpose

On August 1, 2019, I conducted an unannounced compliance inspection of Ervin Amasteel Division (Company) located adjacent to Adrian, Michigan in Lenawee County. The purpose of the inspection was to determine the facility's compliance status with the applicable federal and state air pollution regulations, particularly Michigan Act 451, Part 55, Air Pollution Control Act and administrative rules and the Company's Renewable Operating Permit (ROP) No. MI-ROP-B1754-2018.

Facility Location

The facility is located adjacent to city of Adrian in Madison Township in an industrial area. Residential homes are located about 600 feet to the NE of the melt shop and about 1000 feet to the South.

Facility Background

The facility was last inspected on July 6, 2017 and was found to have some minor compliance issues. The facility is a cast steel shot and grit abrasives manufacturer. The facility operates one 40-ton capacity Electric Arc Furnace (EAF), from which the molten steel is processed to form shot and grit. The facility has approximately 95 employees and operates 24 hours a day, five days a week. The EAF is operated from approximately 7 PM to 10:00 AM to take advantage of reduced electricity rates.

Regulatory Applicability

The entire facility currently operates under ROP No. MI-ROP-BI1754-2018 that was issued on March 5, 2018.

The facility is considered a Major source of CO and an area source of HAPs.

The facility is subject to the Area Sources Electric Air Furnace Steelmaking Facility NESHAP, 40 CFR Part 63 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.

There are several PTI exempt processes at the facility that were listed in the recent ROP renewal application. These include the following:

EU-SPACEHTRS-Natural gas fired space heating units ranging from 0.1-0.99 MM Btu/hr. (exempt per Rule 282 (2)(b)(i)

EU-WTRHTR-Natural gas fired water heating unit 0.28 MMBtu/hr. (exempt per Rule 282(2)(b)(i)

EU-LPGTANKS-Two 30,000-gallon propane storage tanks. (exempt per Rule 284(2)(b))

EU-RXGEN-Natural gas fired (endothermic) atmosphere generator 10 MMBtu/hr. (exempt per Rule 285(2)(l)(iv)

EU-HTSFUR-Natural gas fired heat treat furnaces ranging from 1.2-2.1 MMBtu/hr. (exempt per Rule 282(2)(a)(i))

Arrival & Facility Contact

Visible emissions or odors were not observed upon my approach to the Company's facility. I arrived at 8:00 am, proceeded to the Company's front office to request access for an inspection, provided my identification and spoke with Richard Payne (RP) Plant Engineer and John Gramm (JG) Plant Manager for the facility.

I informed them of my intent to conduct a facility inspection and to review the various records as necessary.

Both RP and JG extended their full cooperation during my visit and fully addressed my questions.

Pre-Inspection Meeting

The pre-inspection meeting was brief. I asked them if there had been any changes at the facility since I had listed inspected the facility. The only change of note was that about a week ago, they replaced a large ventilation duct elbow which was part of the ventilation duct between the EAF building and the large dust collector located in the southern part of the property. The previous elbow was heavily deteriorated due to acidic emissions and erosion from particulates impacted it. (Note: Lime is added just downstream of the elbow. It is used to protect the baghouse and to ensure that the captured baghouse fines are non-hazardous.) I then outlined to RP what I wanted to inspect and indicated that I would request some records after the inspection. It was also noted that the annual CO stack test was scheduled for August 13-14.

Onsite Inspection

RP gave me a tour of the facility. Safety equipment included hard hat with earmuffs along with secondary ear plugs, safety glasses, safety shoes and a safety vest.

RP showed me the scrap yard. (Open sided building with roof.) It handles 300 to 400 tons of scrap per day. 90% of the scrap comes from Omnisource with some coming from Padnos and other scrap dealers. The scrap includes sheet metal stampings, bushings, frag, plate and structural pieces, manganese pieces etc. They use the paint filter test method to verify purchase specifications that appear to be oily etc. The material is collected using a magnetic grabber that fills the charge ladle. The non-metallic materials/chucks are loaded by front end loader. No oil or dust was noted. A small train car (electric powered) like set up takes the filled ladle from the scrap yard building to the Melt shop.

We visited the EAF building and a roof adjacent to it. The EAF was in the process of being tapped. A tremendous amount of smoke was being generated. For the most part it appeared to be captured by the roof canopy hood located near the ceiling of the 100-foot-high building. (The roof of the building has no openings.) Some of the emissions were being captured by the "fly swatter" hood located close to where the tapping was occurring. Generally, no smoke was observed exiting the building except through the ventilation system. There are 2 vents on the south side of the Melt shop and one on the east side of it near the roof line. These are the vents that EPA was interested in during their previous inspections and concluded an administrative consent order with the Company regarding this issue. As a result, the Company has altered the fans associated with the side vents so that they are not turned on when the EAF is in operation. The east vent was closed but the south vent was open due to a chimney effect of the hot gases from the EAF pushing open the gravity louvers on the vent. Despite the fan not being on, minor amounts of opacity were noted briefly coming out the south vent during the tapping part of the EAF cycle. I estimated the opacity at 10%. The actual 6-minute average is probably lower than that since the tapping only takes about 4 minutes to complete. The opacity limit is 6%. A few minutes later, the tapping was over and the smoke in the ceiling area quickly cleared. We then proceeded to the EAF pulpit/control area located directly adjacent to the EAF. We observed the EAF for a while from this location. We witnessed the 3 electrodes being placed into the scrap and being turned on to start the melt. I took several photos of all the process parameters being displayed on the control room screens. See attached. This includes the damper positions.

The Melt shop now has a HMI system to allow for the automated operation of the Melt shop hood dampers. This includes the furnace control damper, the furnace monitor damper, the caster monitor damper, the box and ladle collection damper, the fly swatter collection damper and the atomizing tank collection damper. The automated system allows for the control of damper openings, as well as the percentage that an individual damper is opened. Damper openings are controlled based on the stage of the process (melting, pouring, and casting) to optimize the use of the 300,000 scfm of airflow available to draw off emissions.

They try to control the chemistry of the steel by the scrap composition. The use four different alloys including carbon and manganese even though they only produce one grade of steel. Attached photo shows a snapshot of the chemical composition of the steel while we were in the control room. Generally, the metals that are at most concern for air quality purposes such a chromium, lead, nickel etc. were at low levels.

A heat from tap to tap takes about one hour and 20 to 30 minutes. They try to completely empty the furnace into the ladle so that they can repair the furnace every day due the use of an "acid practice" type refractory. The refractory is acidic in composition and is sprayed on rather than being in brick form. It is cheaper to shut down daily due to the cost of energy after 11 am. (When you shut down the furnace, the refractory is damaged due to the extreme change in temperature.)

As we exited the control room, we walked by the EAF and where the "fourth hole" ventilation is located coming out of the EAF.

The EAF has a Direct Evacuation Control (DEC) system that is used for primary ventilation of the off gases produced by the melting operation of the furnace. (Used when the roof to the EAF is in place when charging/taping is not occurring. They scrape the top of the furnace that holds the furnace roof prior to adding a charge to keep it free of debris for quality control purposes and to reduce air emissions.) The DEC is coupled to the furnace interior employing a method referred to as a "fourth hole." The ventilation gases drawn from the fourth hole go into ventilation elbow where the combustion process started in the furnace is encouraged to continue. There is a gap in the ventilation duct that allows outside air to be drawn in. This is the "CO destruction device" referenced in their ROP permit.

After the heat has been moved from the furnace to the casting ladle it is poured into the tundish which has holes in the bottom and water is sprayed on the molten metal as it comes through the holes. The fly swatter hood is used to cover the tundish ladles for particulate control during the casting process.

RP then showed me the rest of the Melt shop and the product that is produced by casting process. The equipment associated with the casting wasn't closely observed. This area used to be considered EU 0004; shot forming area. However, emissions from this area are now captured by the same baghouse used for the rest of the Melt shop. (FG-0009). The South side of the Melt shop has a sealed door entry that must be activated to exit/enter.

RP showed me the North slag building. This is a small building open on one side located near the scrap yard. Slag from the furnace is placed inside the building to cool. When the front-end loader enters the building, it triggers a motion sensor that turns on a baghouse located behind the building. There was some slag in the building during the inspection, but the baghouse was not running since nothing had been deposited in the building recently. RP indicated that they were dealing with a minor electrical problem for the couple of days that was preventing the fan from automatically turning on. Otherwise, the baghouse appeared to be in good shape. See attached photos. After it cools, the slag is removed from the building and brought to the South side of the plant.

RP took me to the South slag area of the facility. It is a several acres of open ground directly south and surrounding the EAF baghouse. Slag coming from the EAF is brought and deposited into a pile daily. 2 or 3 times a year, an outside contractor comes in to process the slag into a sellable product. Each visit takes a couple weeks to complete. The outside contractor used conveyors and screens to sort the building and a bulldozer to crush the larger chunks. During the inspection, this process was not operating, and no dust was noted. Facility wide, levels of fugitive dust were very low. They have sweeper that is used daily and a contractor operated vacuum truck that comes by weekly.

RP took me to look at EAF baghouse. Just outside the 8-section positive pressure-reverse jet baghouse is where a large ventilation duct was coming in from the Northside of the facility where the EAF is located. A smaller auxiliary fan has been added siting directly adjacent to the original fan. This auxiliary fan is used when the EAF is not in operation. Next, we entered the baghouse control room. See attached photos of the control panel and pressure drop meters for each section of the baghouse. The readings were generally close to 11" of inches of water.

Next, we went outside to look at the 2 dust boxes located underneath the baghouse. Collected solids from the baghouse are routed into 1 of 2 dust boxes for collection. On one of the boxes, I observed a small leak of dust coming off the top of the box from faulty seals. This problem was noted during the previous inspection but was clearly had significantly improved. The was also very littles fines deposited on the ground.

We stopped to look at the Grit dust collector associated with EU-0007. No opacity was observed, and the collector appeared to be operating properly.

We stopped to look at the dust collector associated with EU-0004. This was an 80,000-cfm baghouse that was used for the direct pick-up air in the shot forming work area in the Melt shop. This baghouse has been disabled as emissions that were directed to it are now direct to the EAF baghouse and was slated to be torn down soon.

RP showed me the 20,000 SCFM ASCAST (HI-Carb) dust collector associated with the shot processing equipment. It appeared to be operating properly with no opacity noted.

Recordkeeping/Permit Requirements Review

-MAERS Review

Facility is operating at only fraction of permitted emission limits. 32 tons of CO emissions reported in 2018. 12 tons of S02, 17 tons VOC and 27 tons of NOx also reported.

Overall, 2018 MAERS shows compliance.

-Permit Requirements Review

EU-0007

Emission unit includes processes associated with the production, cleaning and sizing of abrasive grit. Emissions are controlled by a 26,420 scfm baghouse (SV11) (Grit Dust Collector) located on the south-end of the building.

Emission Limits - Monitoring/Recordkeeping

Restricts PM, PM10 and PM2.5 emissions, as well as limiting opacity to a six-minute average of 5%. Compliance is based upon proper operation of the baghouse. Proper operation is based upon differential pressure monitoring, for which the facility is required to monitor and record daily.

Status

I reviewed records from May 29, 2019 through July 16, 2019. The records list the operational range as 1"-4". Review of the records showed that all the readings were within range. I also looked at the repair log for last 2 years. Nothing notable. See Attachment (1).

Note: Observation of the baghouse exhaust during the inspection showed no visible emissions. Observation of the area around the baghouse showed good housekeeping practices.

FG-0005

Flex group includes shot processing equipment controlled by Baghouse-0005

(20,000 scfm) (As Cast/Hi-Carb Collector)

Emission units within flex group include:

EUASCSTDRYER1, EURMLTDUMPHOIST, EUACSCRNLINEBINS, EU#1LINEDRYELEV1, EU#1LINEDRYELEV2, EUAMALINEBEATSYS, and EU#4BEATERSYSTEM

Emission Limits - Monitoring/Recordkeeping

Restricts PM, PM10 and PM2.5 emissions. Compliance is based upon proper operation of the baghouse. Proper operation is based upon differential pressure monitoring. If an excursion outside the established pressure drop range (1.5"-5.5") occurs, the facility is required to observe for visible emissions. If visible emissions are noted, the facility is required to conduct Method 9 readings and take remedial action within 24 hours. Also, requires monthly inspections of the baghouse.

Status

I reviewed baghouse records from May 14, 2019 through July 2, 2019. The records document that the pressure drop reading were within the established range. Review of the records showed that all the readings were within range. I also looked at the repair log for 2019. Nothing notable. See Attachment (2).

Design/Equipment Parameters

Requires exhaust stack be vented obstructed vertically upward.

Requires the facility to implement and maintain a Fugitive Dust Control Plan. Facility is required to make daily observations in accordance with the plan.

Status

The facility has a Fugitive Dust Control Plan in place for this portion of the facility.

Note: Observation of the baghouse exhaust showed no visible emissions.

FG-COLDCLEANERS

The facility has one 30-gallon cold cleaner. It was not observed during the inspection.

FG-0009

Flex group includes the 40-ton capacity electric arc furnace and associated pouring and casting operations that are controlled by Baghouse-0009 (Flowers Dust Collector). Additionally, separate ventilation to Baghouse-0009 provides control for the pouring ladles and two side draft hoods "fly swatters" used during furnace tapping. Baghouse-0009 has eight bays and the facility replaces the bags in one bay each year.

Emission units within flex group include: EU-EAF, EU-POURING and EU-CASTINGTANK

Emission Limits - Monitoring/Recordkeeping

Restricts CO, PM, PM10 and visible emissions.

Compliance with the CO emission limit is based upon annual CO emission rate testing, which is conducted in lieu of a CEMS unit. If testing shows a CO emission rate greater than 70% of the limit, a CEMS is required to be installed. Annual testing has showed emission rates below 70% of the limit. The next test is scheduled for Mid-August. The facility calculates and maintains records of the CO emission rate based upon the annual stack testing.

Compliance with the PM, PM10 and opacity emission limits are based upon past compliance testing, calculation (based upon most recent testing) and recording of PM hourly emissions, proper operation of the baghouse and daily Method 9 observations.

The facility conducted compliance testing in July 2013 at which time they demonstrated compliance with the PM emission limits.

As required by the permit, the facility maintains records of the hours of operation and tons of steel melted. Records reviewed showed compliance with the melted steel limits and hours of operation.

(See Attachment (3).) The records didn't include CO calculations as they were waiting to base them on the new stack test scheduled for August.

Proper operation is determined via the requirements to monitor and record the pressure drop across the baghouse on a daily basis, conduct three 6-minute Method 9 readings each day for the baghouse, monthly VE observation from the melt shop and baghouse dust handling system, monitoring and recording of the furnace static pressure, fan motor amperes and damper position once per shift. Additionally, proper operation is determined via the requirement to conduct monthly operational status inspections of the total capture system.

- Monitoring and recording of the furnace static pressure, fan motor amperes and damper position is performed by the furnace operator once per heat. The furnace operator has the ability to adjust the system to control furnace static pressure. The facility provided the requested records documenting compliance with the recording requirement. (See Attachment 4.)
- The facility provided Method 9 observation records for the month of June 2019, as requested. No opacity was noted during the month of June. Staff did not observe any VE during the inspection. (See Attachment 5.)
- Inspection of the capture system (duct) is documented on the daily collector inspection records.

Status

Compliance.

FGMACT-YYYYY

The emission unit is subject to 40 CFR Part 64 CAM for PM, which is also a requirement under Subpart YYYYY.

CAM requires monitoring of both the control and capture system. CAM monitoring for the control device is accomplished through the requirement to record the pressure drop on a daily basis. If the pressure drop is out of the normal parameters, the facility is required to make VE observations, and then conduct Method 9 readings if VE is noted.

As noted during a previous inspection, since the facility is required to conduct daily Method 9 readings under Subpart AAa, this is included in CAM.

The facility is submitting the required semi-annual CAM certification reports.

Subpart YYYYY – Area Source Electric Arc Furnace Steelmaking NESHAP

The facility is subject to Subpart YYYYY, which regulates scrap charged to the EAF, emissions from the EAF and opacity from the melt shop.

The facility is considered an existing source under Subpart YYYYY.

<u>Emission Limits</u>

The EAF is subject to a PM emission limit of 0.0052 gr/dscf and the melt shop is subject to a fugitive opacity limit of 6%.

Status: Compliance

The facility tested and demonstrated compliance with the PM limit in June 2008

The facility conducted and documented Method 9 readings for melt shop fugitive opacity on January 30, 2013. The deadline for conducting the testing was June 30, 2008. The late testing was documented during a previous inspection and addressed in a violation notice issued September 5, 2013.

<u>Material Limits/Process</u>

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 YYYYY.

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 for the facility to have a site-specific plan.

Contaminants other than mercury

The facility is operating under an approved plan in accordance with Subpart YYYYY. 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). 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.

<u>Reporting</u>

Subpart YYYYY requires the submittal of semi-annual compliance certifications.

The facility is submitting semi-annual certifications in accordance with Subpart YYYYY.

Subpart AAa – NSPS, Standards of Performance for Steel Plants: EAFs and AODs

The facility is subject to NSPS Subpart AAa –Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 17, 1983, which regulates PM emissions from the EAF and opacity from the EAF control device as well fugitive emissions from the melt shop.

The requirements of Subpart AAa are incorporated into the individual emission units/flex groups of the ROP.

Emission Limits

Limits PM to 0.0052 gr/dscf, which is the same limit contained in Subpart YYYYY.

Also, limits opacity from the EAF baghouse to 3% and opacity from the metal shop to 6% (same as Subpart YYYYY.)

The facility most recently demonstrated compliance with the PM emission limit as part of compliance testing required by Subpart YYYYY.

Limits opacity from the melt shop to 6%

Testing to demonstrate compliance with the melt shop opacity limit was required within 180 day of startup of the new EAF in 1994. The facility stated that the first recorded/documented Method 9 readings for melt shop opacity were conducted on January 30, 2013. Late testing was documented in a violation notice issued on September 5, 2013.

Regarding ongoing compliance, NSPS Subpart AAa allows for demonstration of compliance with the melt shop opacity limit through monitoring of the EAF static pressure drop, fan amperes and damper position once per shift. The facility is conducting the required monitoring.

Monitoring

Requires a COM unit, unless opacity from the control device is performed by a certified observed (Method 9) daily.

The facility conducts daily Method 9 readings of the baghouse.

Monitor and record the control system fan motor amperes and damper position once per shift **or** operate a monitoring device to continuously record the volumetric flow rate through each hood **or** operates a monitoring device the continuously records the volumetric flow rate at the control device inlet and check and record the damper positions once-per-shift

The facility monitors and records the fan system amperes, furnace static pressure and damper positions once per heat.

FGSI-RICEMACT

The Company has only a very small spark ignition style generator, so it was not evaluated for compliance during the inspection.

Post-Inspection Meeting

After the inspection, I met with RP and JG to discuss the results. I noted the issue with the very minor of dust that was coming out of the dust boxes underneath the EAF baghouse. We discussed the issue with south vent on the EAF building and minor amounts of opacity noted and that I would be following up on this issue after I reviewed the ROP conditions related to issue. Finally, we discussed the EAF dust collector waste that has a heavy metal stabilizer added to it called Bantox which consists mostly of calcium silicates. It is sent to be disposed of at the Carleton Farms landfill. I was concerned that this material may become exothermic when water is added to it. This issue could be contributing to the elevated temperatures observed at this landfill. I requested the SDS and amount disposed in 2019. (See Attachment (6)). More than 2.5 million pounds of the waste was generated so far in 2019 of which 19% of it contains Bantox. I thanked both RP and JG for their time and cooperation and left the facility at approximately 10:30 am.

Compliance Summary

The Company is in compliance. There were two areas of concern.

1. I was unable to determine compliance with the 6% opacity limit for fugitive dust emissions coming from the EAF building. The Company is required to

a) Investigate what methods/procedures that they can implement that would reduce opacity coming from the vent on the upper south wall of the EAF building. An example would be to look at/adjust damper settings during tapping to improve capture in that part of the building to see if this could result in an improvement.

b) Conduct Method 9 readings to show compliance.

c) Provide an update by the end of August.

2. Attachment (6) information related to the EAF baghouse dust waste that is treated with a heavy metal stabilizer was forwarded to Detroit AQD office to further investigate if this waste is contributing to elevated temperatures at the Carleton Farms landfill due to possibility of an exothermic heat generating reaction that could occur in the presence of water.

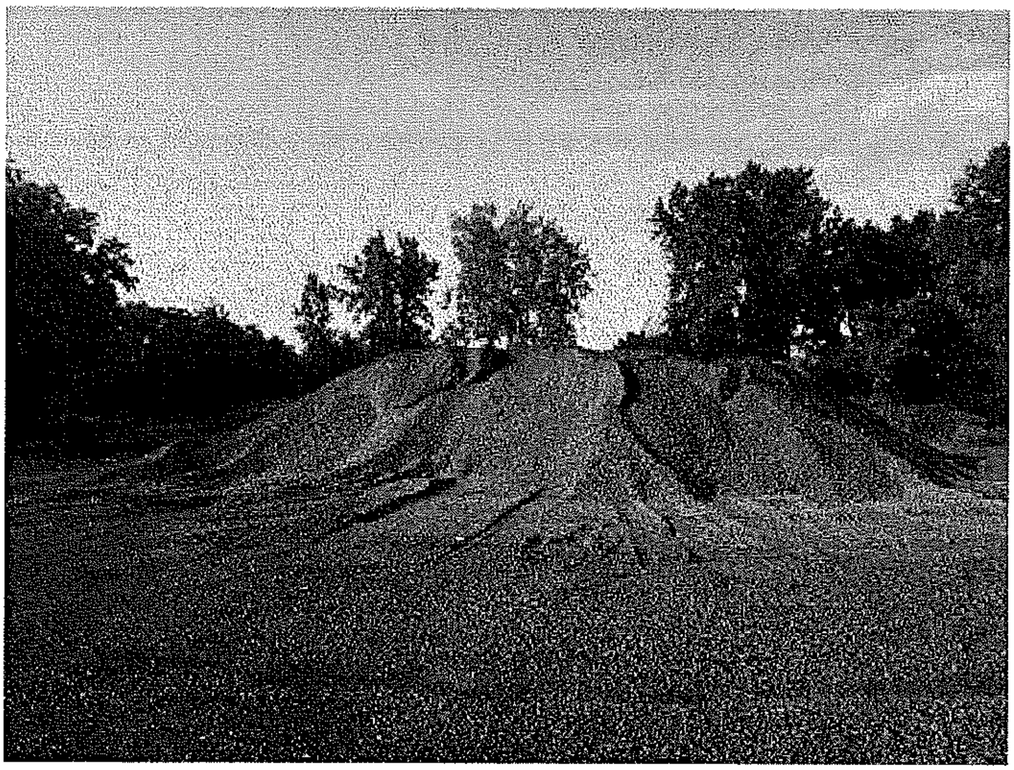
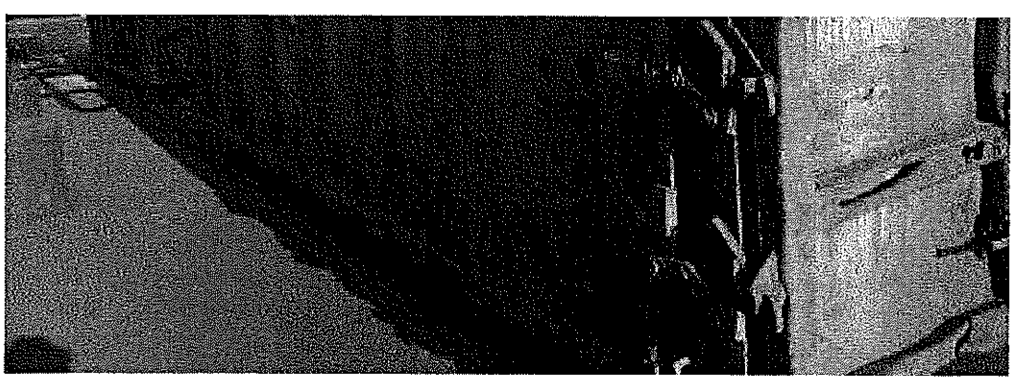
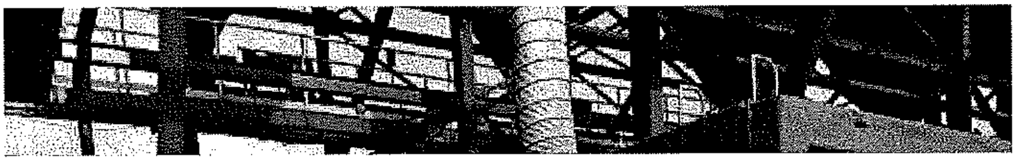


Image 1(Slag Pile) : One of 3 slag piles. Raw, middle, fine grade. This one is the middle grade that has already been screened to produce this size of material.





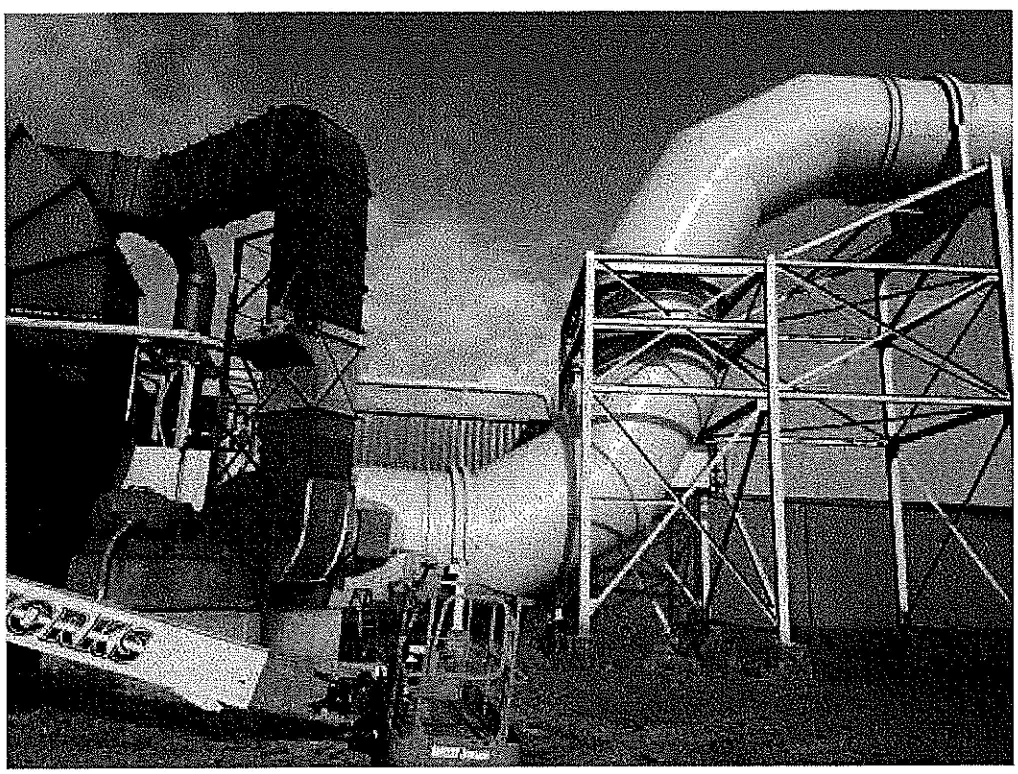


Image 3(New Elbow) : New elbow that had been installed recently located just before EAF baghouse.

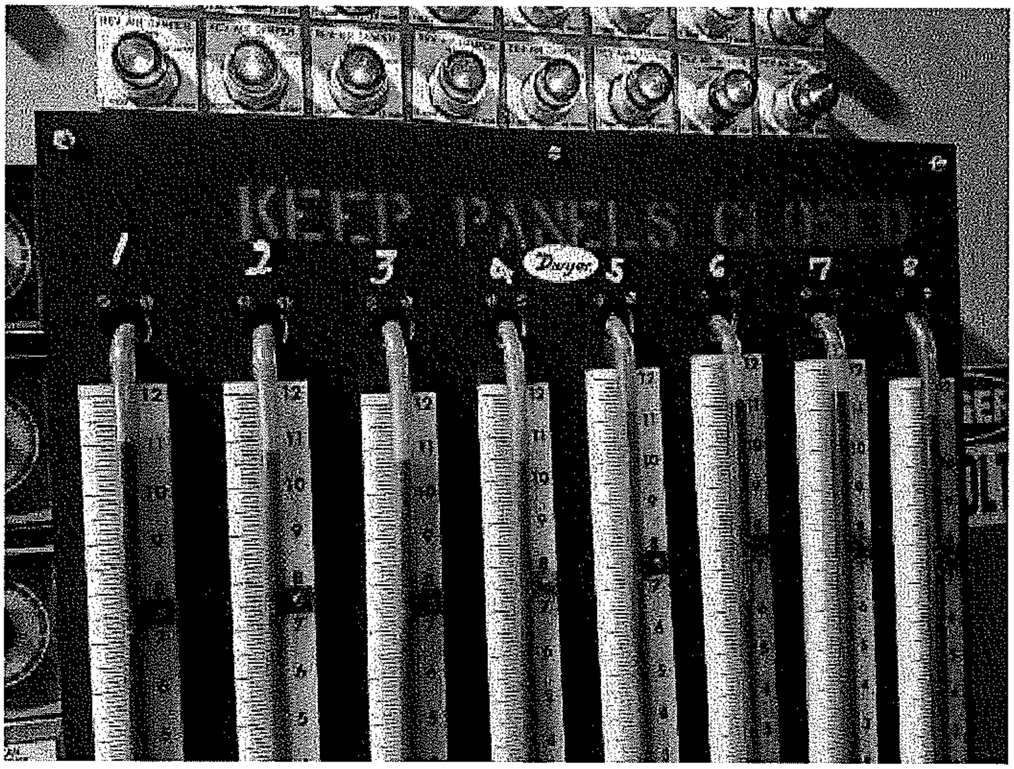


Image 4(EAF Baghouse Press.) : EAF Baghouse pressure differential for each of the 8 compartments. Shows 10 to 11".

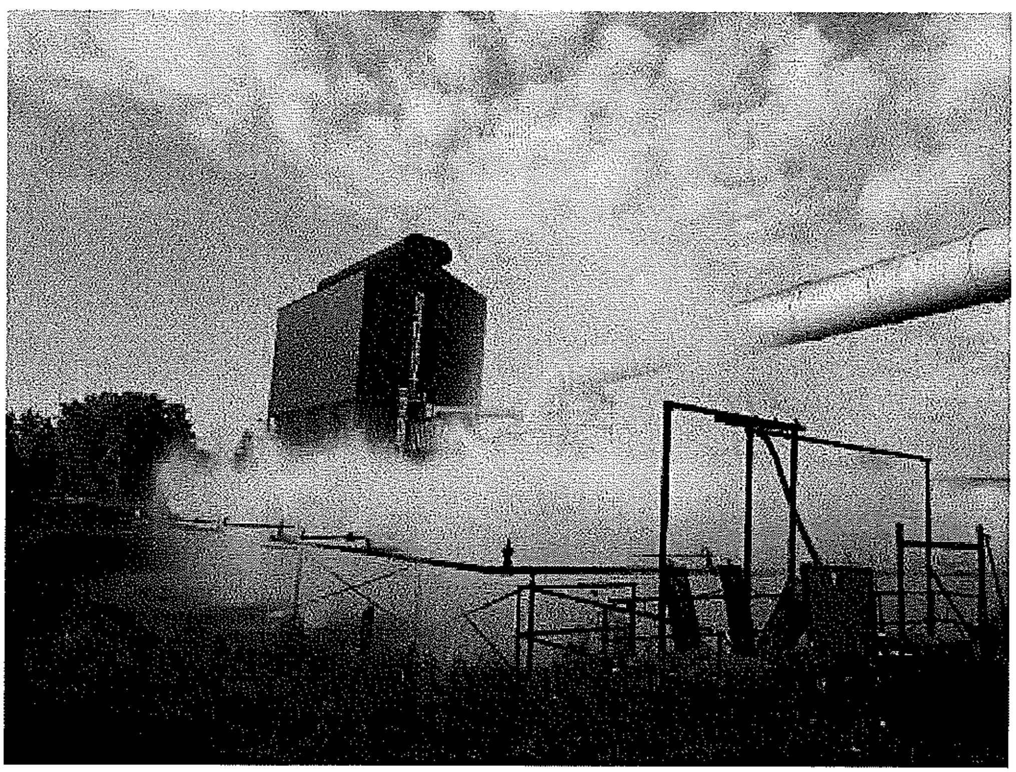


Image 5(EAF Baghouse) : EAF Baghouse. No opacity coming from roof monitor vent.

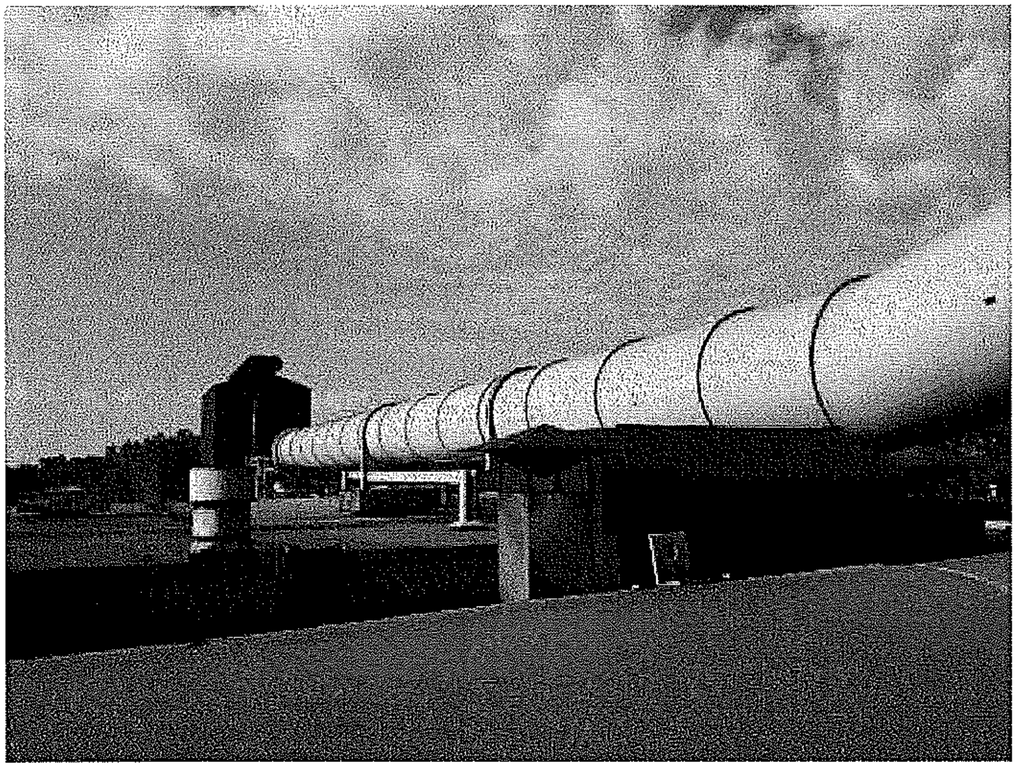


Image 6(EAF Baghouse Vent.) : EAF baghouse ventilation pipe from roof.

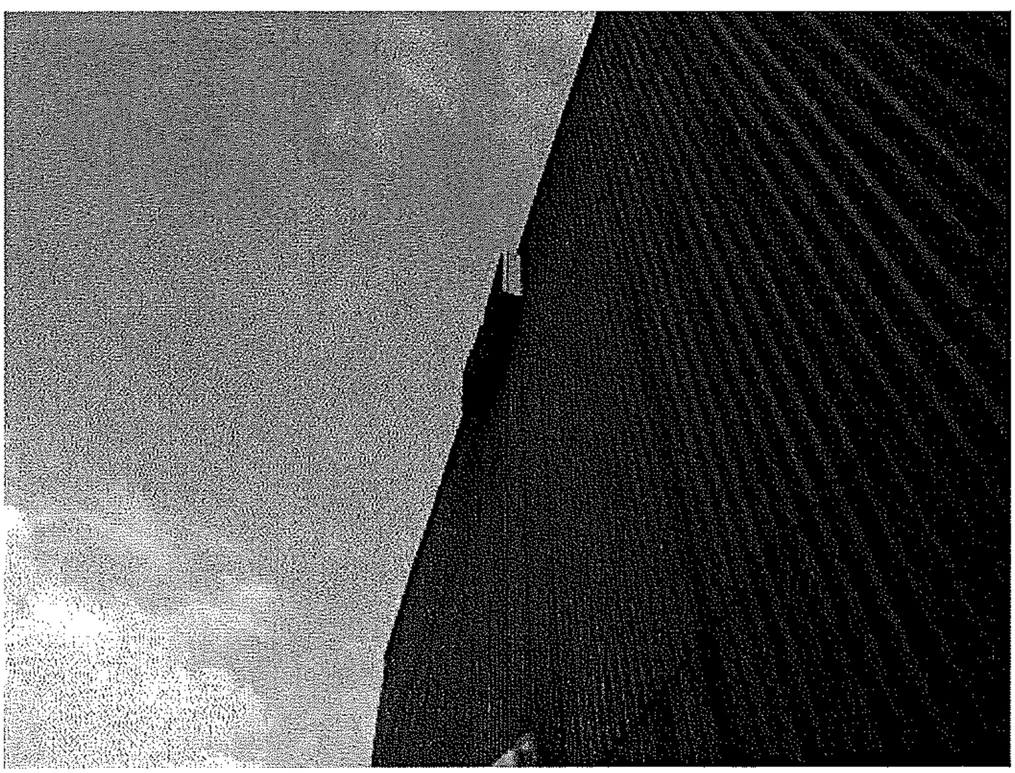


Image 7(South Vent-EAF Bldg.) : South vent of EAF building showing minor opacity.

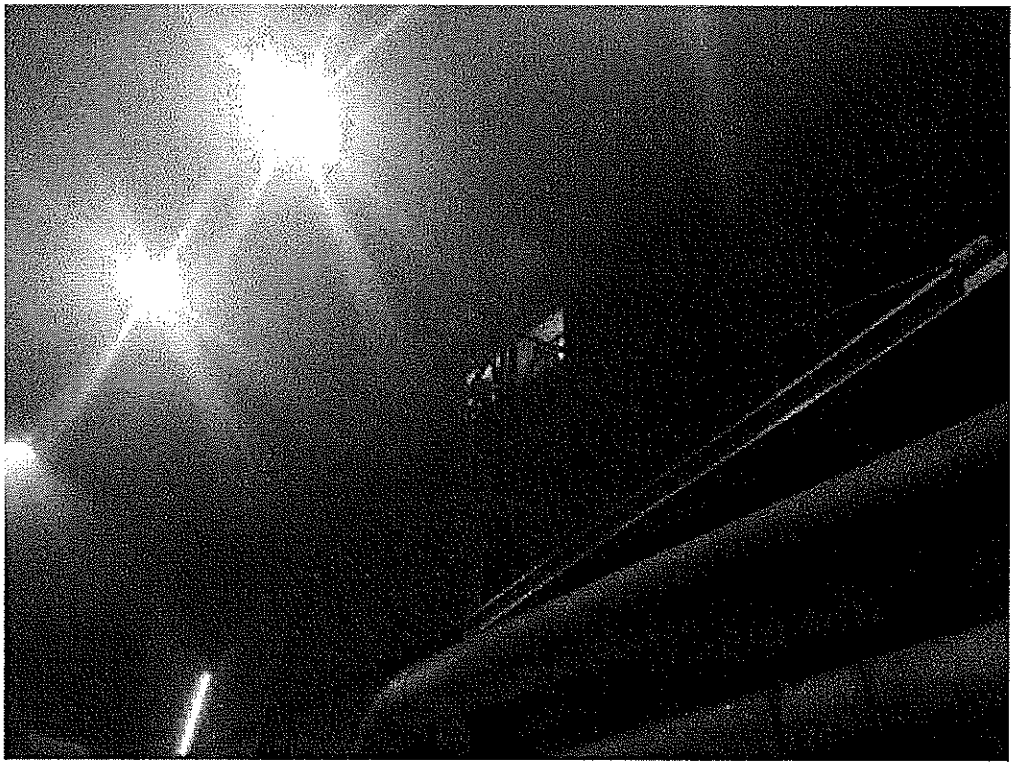


Image 8(South Vent-EAF Bldg) : South vent-EAF building from inside.

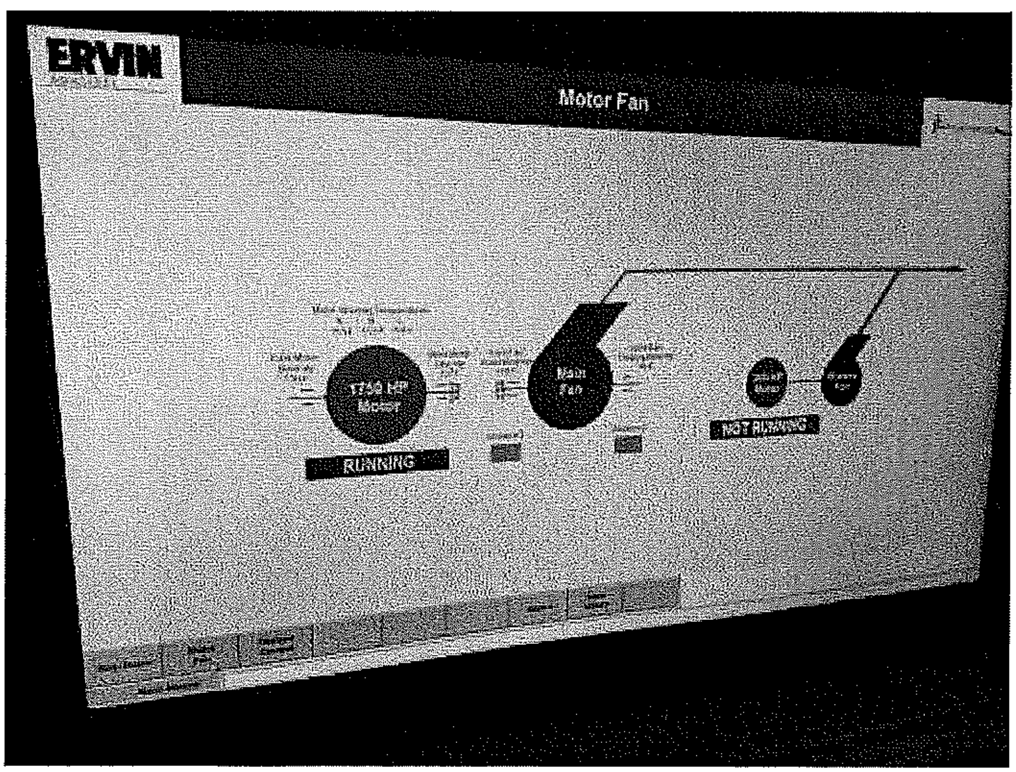


Image 9(EAF Control Screen 1) : EAF Control screen showing baghouse exhaust status.

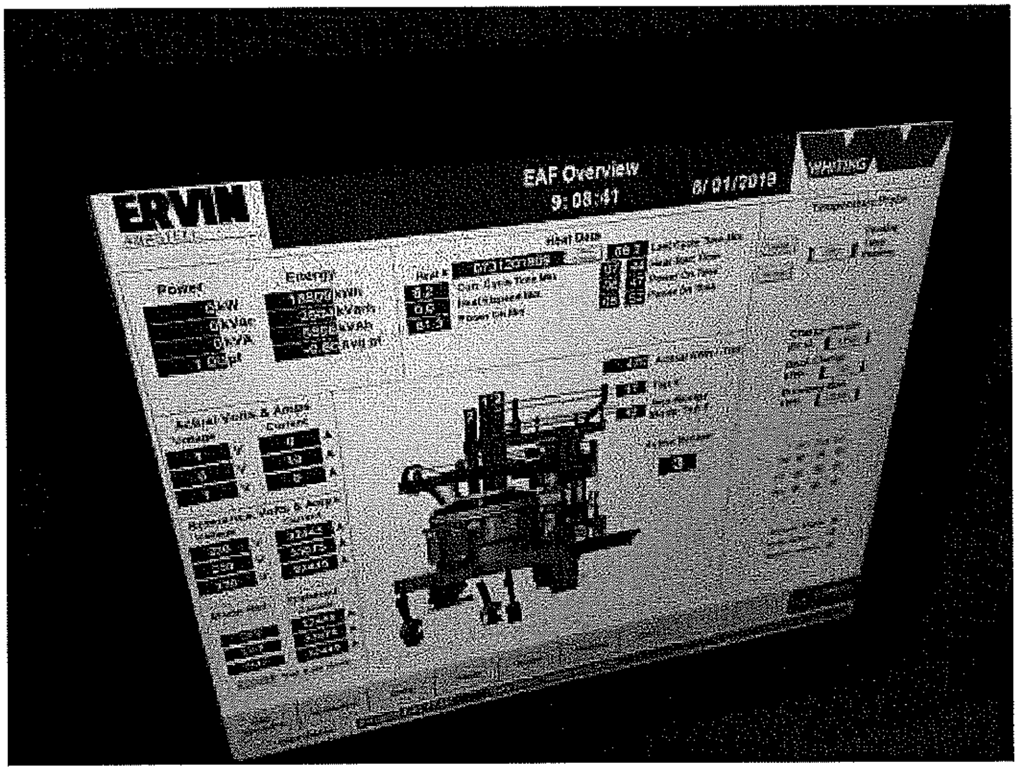
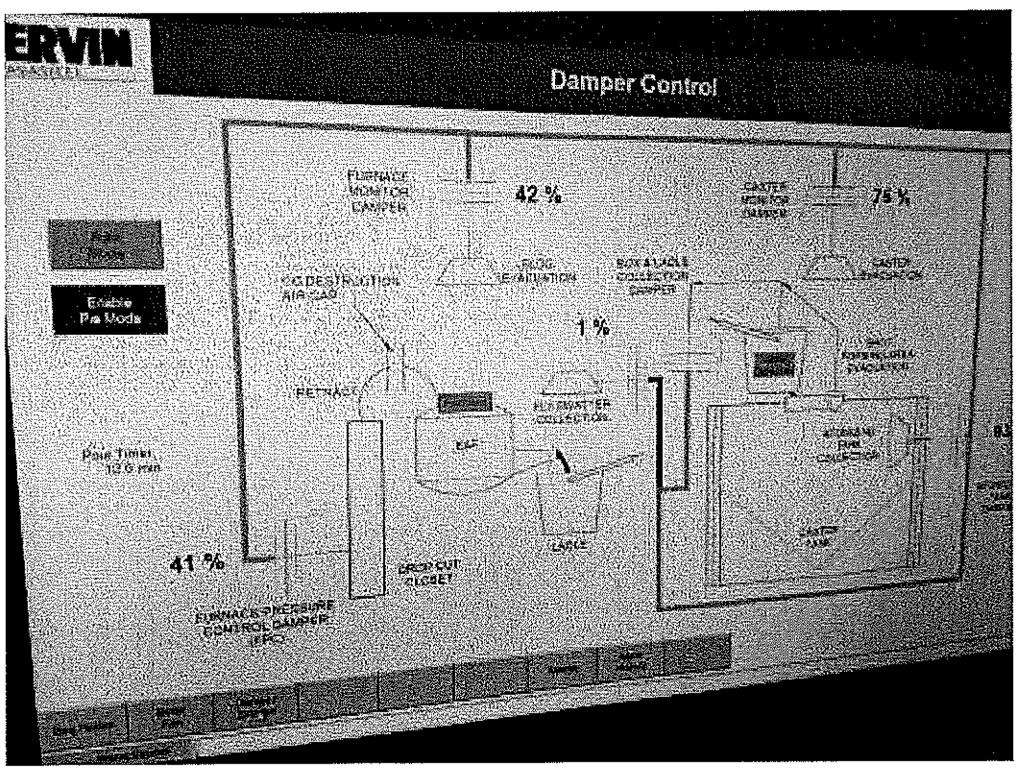


Image 10(EAF Control Screen 2) : EAF Control Screen Overview



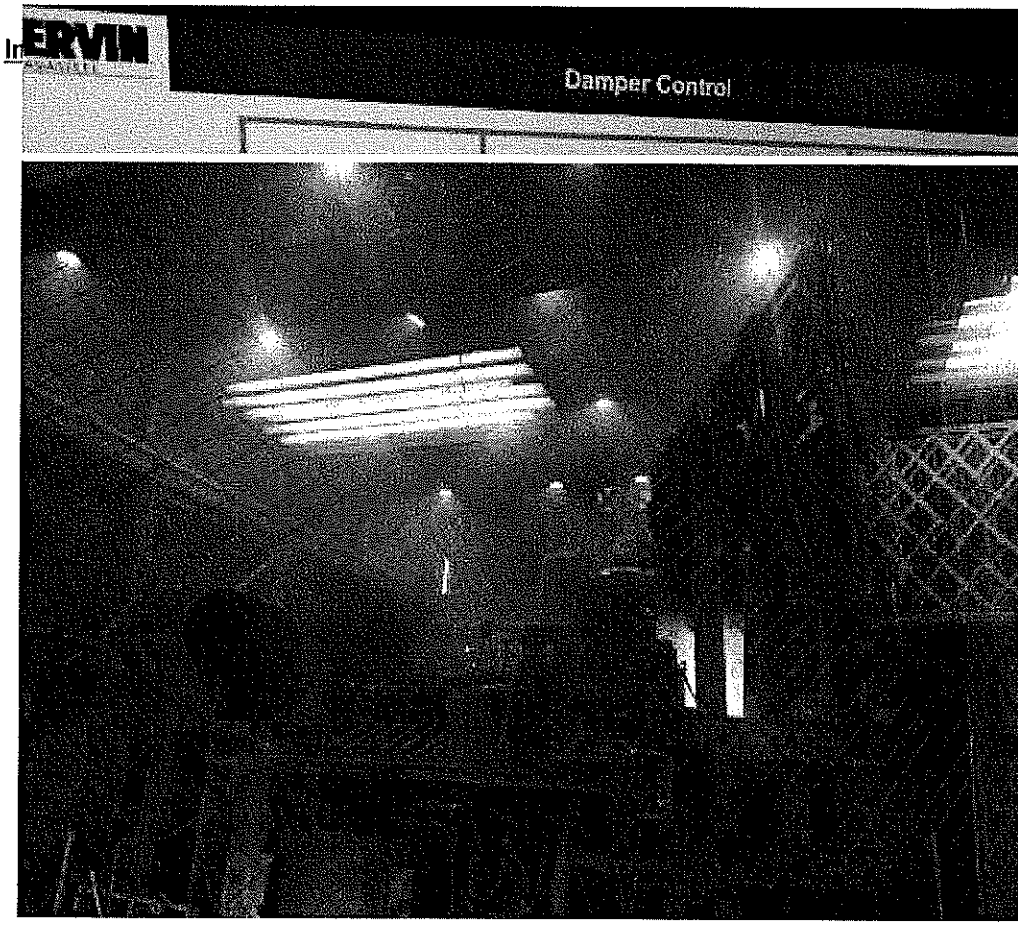


Image 12(EAF) : EAF as viewed from inside control room.

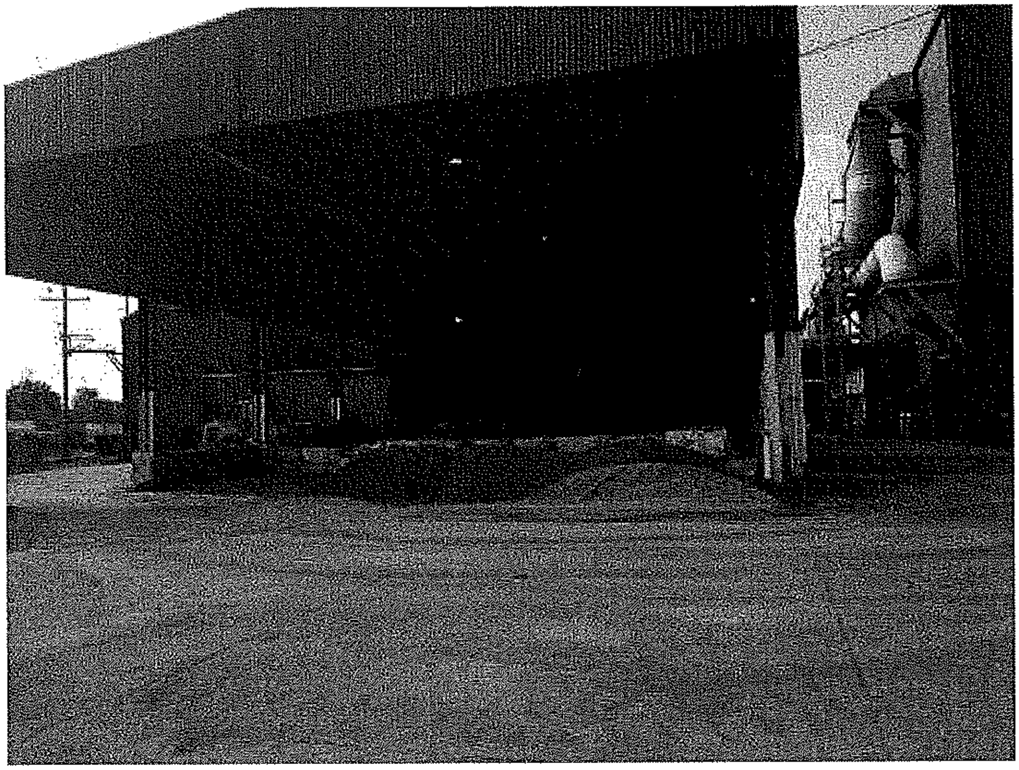


Image 13(Scrap Metal Shed) : Scrap metal shed.

NAME M. Kovalchick DATE 8/12/19 SUPERVISOR