Grede LLC | 801 S. Carpenter Ave Kingsford, MI 49802

Operations

&

Maintenance

Plan

3/27/2020

Updated 12/15/2021

Air Pollution Control Plan

Consisting of:

Capture System, Control Device System Operation & Maintenance Plan

Preventive Maintenance Plan

Startup, Shutdown & Malfunction Abatement Plan

Contents

Operation and Maintenance Requirements	6
Preventive Maintenance	8
Malfunction Abatement Plan	108
Mold Vent Ignition Plan	110
Cupola Start-up	113
Cupola Tap Out Procedure	121
Melting Down the Stack	124
63.7700(b) (4) Monitoring Plan Bag Leak Detection System	127

Purpose

These plans document certain responsibilities and procedures for the operation; maintenance and monitoring of air emission control equipment and are consistent with malfunction planning requirements of the MACT Standard for Iron and Steel Foundries (40 CFR Part 63 Subpart EEEEE). This document also lists Compliance Assurance Monitoring, or "CAM" requirements (40 CFR Part 64) and provides information for the proper operation and maintenance of collection equipment as required by Michigan Rule 336.1911, Malfunction Abatement Plans.

Fabric Filter Air Pollution Control Devices

Fabric Filter Air Pollution Control Devices route conveyed process emissions to remove filterable particulate from the air stream. Dry Collectors contain bags, which filter particulate matter from the air by drawing in the air stream and trapping particles on the surface of the bags. The clean air is released to the atmosphere while the particulate matter is discharged and shipped to a landfill or beneficially reused.

Wet Collector Air Pollution Control Devices

Wet Collector Air Pollution Control Devices route conveyed process emissions to remove filterable particulate from the air stream. Wet Collectors "scrub" the air traveling through the collector, mixing with dust and forming sludge. The clean air is released to the atmosphere while the particulate matter is discharged and shipped to a landfill or beneficially reused.

The following regulatory documentation requirements, where applicable, are intended to be addressed in this plan

- Capture System Operation and Maintenance
- Control Device Operation and Maintenance
- Control Device Corrective Action Response Documentation
- Startup, Shutdown and Malfunction
- Mold Light Off Description
- Preventive Maintenance
- Scrap Selection and Certification

OPERATION AND MAINTENANCE REQUIREMENTS-63.7710

Responsible Personnel:

- Maintenance Manager/Maintenance Supervisors

  Maintenance Manager/Supervisors will designate the appropriate maintenance individuals to conduct each PM.
- Leadperson Environmental Maintenance

  Leadperson Environmental Maintenance maintains the PM system for Environmental PM system and will ensure all PMs are completed

Capture System Operation and Maintenance – 63.7710(a)-(b)

The following inspections are made of the subject capture systems:

- PM schedule that is consistent with the manufacturer's instructions for routine and long-term maintenance.
- Monthly PM inspection of equipment important to the performance of the capture system
- Monthly observations of the physical appearance of the capture and ventilation system equipment (holes, dents, accumulated dust, fan condition). This will be performed in routine monthly equipment PM's and noted.

Control Device Operation and Maintenance – 63.7710(a)-(b)

The following inspections are made of the control devices:

- Recording the pressure drop to ensure it is within the range specified daily.
- Recording the fan amperage to ensure it is within the range specified daily.
- Recording visual inspections of exhaust stacks for visible emissions daily.
- Recording pH levels on the Acid Scrubbers per shift daily.
- Recording flow rate on the Acid Scrubbers per shift daily.

- Recording upper stack temperature for the Cupola baghouse, amperage of blower, differential pressure on a daily basis, and continuously monitored while Cupola is in operation.
- Recording Visual inspections for smoke on the Cupola baghouse daily.
- Annual inspection/calibration of the amperage gauges.
- Annual inspection/calibration of magnehelic/photohelic gauges for pressure drop.
- Quarterly monitoring of the fan for wear, material buildup, and corrosion through visual inspections, vibration detectors, or equivalent.

Preventative Maintenance

DEFINITIONS

EMR - Environmental Management Representative

Preventative Maintenance Check Sheet (PM) - are issued for a particular piece of equipment with a list of items which require checks of measuring, observing, changing, replacing, or logging.

Maintenance Work Instruction (MWI) - is a list of step by step directions for the safe completion of preventive maintenance function.

PAC - is the part of the Maintenance Department designated for Planning and Control.

RESPONSIBILITIES

The individual department manager, supervisor, or designate is responsible for performing job specific training.

The Maintenance PAC personal assigned to PMs is responsible for issuing PMs at prescribed time frames and forwarding to Repair personal.

The Maintenance Repair person is responsible for timely completion of the environmental PM's and their logging.

The Engineering & Maintenance Manager or designate is responsible for maintaining environmental controls within assigned limits.

The EMR or designate is responsible for setting the monitoring limits of all pollution control devices. This will be based upon permit requirements, best operating practices, and manufacturer recommendations.

The EMR or designate is responsible for monitoring system operation and performance.

GENERAL

PMs are issued per shift, daily, weekly, monthly, quarterly, semi-annual, or annual performance as determined by past performance history or manufacturer recommendations.

Preventative Maintenance Records – 63.7745(a)(2) – All records will be available on site either in hard copy or electronic format and available upon request. Preventative maintenance inspections are intended to identify equipment problems and are reported to the Maintenance Superintendent. Proof of continuous compliance with all requirements of the plan must be maintained.

- Records must be retained for at least 5 years unless otherwise specified.

PROCESS STEPS The Maintenance PAC personnel assigned to issuing PMs will:

Ensure Air Emission PMs are issued at designated time frames.

Forward to designate Repair person to complete PM.

The Maintenance Repair person will complete PM as indicated on printed copy, enter data into the computerized system and forward documentation back to the designated PAC person per the Preventive Maintenance System work instruction

On a weekly basis the Maintenance Superintendent will review all Air Emissions PMs for completeness and compliance.

Any deviation exceeding specification limits needs to be documented and addressed per the Maintenance Corrective Action System work instruction. The deviation must be recorded. The date and time of deviation, cause of deviation, duration of deviation and corrective action taken all must be recorded. Repairs must be made as soon as practicable.

If the equipment issue is resulting in emissions in excess of permit limits it must be shut down immediately and malfunction and abatement plan must be followed.

EU-P009

Title V Equipment Operating Ranges

Equipment Number	Check Equip	Range
324644 Cupola Baghouse	Motor Amps	115-281
	Diff Pressure	1.0 inch minimum
	Combustion Zone Temp.	1300 minimum

Date: 10/31/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000459 / 596 P.M.#: 3000459 Date Scheduled: 10/17/21
========== Shift: Date Due. . . : 10/27/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	1.50

Equipment: 324644 Hartzell Cupola Dust Collector Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Weekly - 324644 Hartzell Cupola Dus

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA HARTZELL CUPOLA DUST COLLECTOR 324644 WEEKLY PM		
		OK WOW
1	SEVEN BAG SHAKERS-TEST RUN IN MANUAL TO OBSERVE THEIR OPERATION	
2	SEVEN SECTION DAMPERS-INSPECT FOR PROPER TRAVEL, AIR LEAKS, PROPER STROKE OF CYLINDER AND CYLINDER MOUNTINGS	
3	SEVEN SECTIONS-INSPECT DRIVE MOTOR MOUNTING & WIRING CONDITION	
4	SEVEN SECTIONS-INSPECT REDUCER MOUNTING & CONDITION	
5	SEVEN SECTIONS-INSPECT SHAKER ARM MOUNTING & CONDITION	
6	SEVEN SECTIONS-INSPECT SAFETY CABLES CONDITION & MOUNTING	
7	CHECK DUST HOPPERS FOR LEAKS	
8	CHECK DUST HOPPER SLIDE GATES FOR DAMAGE AND LEAKS	
9	CHECK ALL AIR VIBRATORS, AIR SUPPLY LINES, HOSES FOR DAMAGE & AIR LEAKS	
10	CHECK FOR LEAKS IN AUGER TROUGH & TROUGH COVER	
11	CHECK OUTLET EXPANSION JOINT FOR LEAKS	
12	CHECK SEVEN SECTIONS. INSPECT BAGS FOR VISUAL DECAY OR BURN HOLES. ALSO CHECK UPPER & LOWER ATTACHMENT POINTS	

Remarks:

PM# 3000459
Original
09/15/21 T White

Date: 10/31/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000458 / 139 P.M.#: 3000458 Date Scheduled: 10/17/21
========== Shift: Date Due. . . : 10/31/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	1.50

Equipment: 324644 Hartzell Cupola Dust Collector Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 324644 Hartzell Cupola Du

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA HARTZELL CUPOLA DUST COLLECTOR 324644 MONTHLY PM		
		OK WOW
1	INSPECT ALL 7 SECTIONS-CONDITION AND MOUNTING OF THE DAMPER FLANGE BEARINGS, GREASE	
2	INSPECT ALL 7 SECTIONS FOR CONDITION AND OPERATION OF THE DAMPER CYLINDERS	
3	GREASE SECTIONS 1-7 SHAKER ARMS (HIGH TEMP GREASE)	
4	GREASE SECTIONS 1-7 BAG SHAKER FRAME WHEELS (HIGH TEMP GREASE)	
5	CHECK 1-7 SHAKER GEAR BOX LEVEL	
6	CHECK AUGER BELTS, SHEAVES, GUARDS FOR PROPER OPERATION AND TENSION	
7	CHECK THE AUGER DRIVE MOTOR FOR SECURE MOUNTING AND DEFECTIVE WIRING	
8	CHECK THE DUST AGER DISCHARGE BEARING (GREASE), AND CHUTE FOR DAMAGE	
9	CHECK DUST AUGER GEAR REDUCER FOR SECURE MOUNTING OIL LEAKS AND CONDITION, CHECK OIL LEVEL	
10	INSPECT BAGHOUSE STRUCTURE, PANELS IN PLACE, HOLES	
11	CHECK OUTLET EXPANSION JOINT FOR LEAKS	
12	CHECK DUCT WORK FOR HOLES & CONDITION	
13	VISUOLITE, CHECK FILTER BAGS & DUCTWORK FOR LEAKAGE	
14	EACH MONTH CHECK HORIZONTAL SECTIONS OF DUCT WORK FOR ANY FINES BUILD UP. REPORT BUILD UP OVER 15% OF DUCT DIAMETER TO SUPERVISOR.	

Remarks:

PM# 3000458
Original
09/15/21 T White

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000461 / 595
==========

P.M.#: 3000461
Shift:

Date Scheduled: 10/17/21
Date Due. . . : 10/27/21

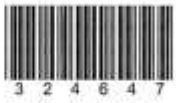
Craft	People	Clock#	Employee	Hours
ELECTRICIAN		18098	Bozile	1.00

Equipment: 324647 Baghouse Blower/Controls 07 Location: 03-001
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Weekly - 324647 VFD Baghouse Blower

ORDER/ITEM

EQ#



JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA BAGHOUSE BLOWER/CONTROLS 324647 WEEKLY PM		
		OK WOW
1	INSPECT THE V-BELT GUARD FOR DEFECTS & SECURE MOUNTING	
2	CHECK THE DRIVE MOTOR BASE MOUNT BOLTS & JACKS FOR TIGHTNESS	
3	CHECK THE DRIVE SHAFT BEARINGS FOR PROPER OPERATION	
4	CHECK THE BLOWER INLET, OUTLET & HOUSING FOR CRACKS OR LEAKS	
5	INSPECT THE DRIVE V-BELTS FOR PROPER OPERATION, CRACKS OR LEAKS	
6	INSPECT THE DRIVE & DRIVEN SHEAVES FOR PROPER OPERATION, SECURE MOUNTING, & PROPER ALIGNMENT	
7	GREASE DRIVE SHAFT BEARINGS (HIGH TEMP GREASE)	
8	CHECK INLET EXPANSION JOINT FOR LEAKS	
9	CHECK DRIVE SHAFT BEARING MOUNTS FOR TIGHTNESS	

Remarks:

PM# 3000461
Original
9/15/21

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000462 / 46 P.M.#: 3000462 Date Scheduled: 10/17/21
========== Shift: Date Due. . . : 10/31/21

Craft	People	Clock#	Employee	Hours
ELECTRICIAN		18098	Bozile	1.00

Equipment: 324647 Baghouse Blower/Controls 07 Location: 03-001
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 324647 VFD Baghouse Blo

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA BAGHOUSE BLOWER/CONTROLS 324647 MONTHLY PM		
		OK WOW
1	INSPECT BLOWER HUB AND BLADES FOR PROPER OPERATION, CRACKS OR DEFECTS	
2	INSPECT WEAR PLATES FOR WEL CRACKS AND THICKNESS	
3	INSPECT INSIDE BLOWER HOUSING FOR WEAR, CRACKS OR DEFECTS	
4	INSPECT INLET EXPANSION JOINT FOR LEAKAGE	

Remarks:

PM# 3000462
Original
9/15/21

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000463 / 395 P.M.#: 3000463 Date Scheduled: 10/18/21
========== Shift: Date Due. . . : 10/31/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	.75

Equipment: 324648 Quencher Baghouse Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 324648 Quencher

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA QUENCHER BAGHOUSE 324648 MONTHLY PM		
		OK WOW
1	INSPECT PUMP TO MOTOR COUPLING FOR WEAR	
2	INSPECT INSIDE OF QUENCHER FOR BUILD-UP OF ASH OVER THE SPRAY NOZZLES	
3	TEST ASCO VALVES-SUPPLY & DRAIN	
4	CHECK PUMP FOR CONDITION & PACKING LEAKAGE	
5	INSPECT PIPING FOR LEAKS	
6	CLEAN SUMP PUMP WELL	
7	MANUALLY TEST EACH QUENCHER SPRAY SECTIONS 1-8	
8	SPRAY PATTERNS SHOULD EMIT A FINE MIST	
9	CHECK PUMP FLOW RATE 1GPM-28GPM	
10	CHECK BACK UP PUMP, OPEN VALVES ON #2 & CLOSE VALVES ON #1. REVERSE PROCEDURE WHEN DONE.	
11	INSPECT PHYSICAL APPEARANCE OF THE QUENCHER, HOLES, CRACKS, DEFECTS	

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000469 / 596 P.M.#: 3000469 Date Scheduled: 10/31/21
========== Shift: Date Due. . . : 11/10/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	3.00

Equipment: 324704 Furness Process Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Weekly - 324704 Furness Process

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA FURNESS PROCESS 324704 WEEKLY PM		
		OK WOW
1	VISUALLY INSPECT EACH MATERIAL AUGER AND HOUSING	
2	VISUALLY INSPECT FOR MATERIAL BUILD-UP IN THE INJECTOR BOXES, TEST AND VERIFY SCALE OPERATION.	
3	CHECK THE CROSS OVER PIPE FOR MATERIAL BUILD UP. REMOVE INSPECTION DOOR TO CHECK INJECTION PIPES AND DUCTING. CLEAN AS REQUIRED.	
4	INSPECT ALL ELECTRICAL WIRING FOR VISIBLE DEFECTS.	
5	INSPECT THE CONDITION OF ALL AIR HOSES AND CONNECTIONS	
6	MANUALLY BLOW OUT INJECTION LINES TO DUCTWORK.	
7	CHECK PHYSICAL APPEARANCE FOR DEFECTS, CRACKS, HOLES.	

Date: 10/31/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000012 / 595 P.M.#: 3000012 Date Scheduled: 11/06/21
========== Shift: Date Due. . . : 11/10/21

Craft	People	Clock#	Employee	Hours
ELECTRICIAN		12213	Skoglund	1.00

Equipment: 301164 HOT BLAST Location: 03-001
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Weekly - 301164 Hot Blast

ORDER/ITEM  

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA HOT BLAST 301164 WEEKLY PM		
	IF ALIGNED FOR CUPOLA RECUPERATIVE BLAST, ONLY STEPS 1 AND 2 CAN BE PERFORMED. ANNOTATE CURRENT BLAST ALIGNMENT ON THE COVER SHEET	**OK WOW**
1	CHECK ALL GAS SUPPLY LINES FOR LEAKS & SECURE MOUNTING	
2	CHECK ALL AIR SUPPLY LINES FOR LEAKS & SECURE MOUNTING	
3	INSPECT ALL MODULATING VALVES FOR SECURE MOUNTING, LINKAGE & PROPER OPERATION.	
4	INSPECT EXPANSION JOINTS ABOVE BURNER ASSEMBLIES FOR AIR LEAKS & CONDITION.	
5	INSPECT EXPANSION BOOTS AT TOP END OF HEAT TUBES FOR CONDITIOIN, LEAKS AND SECURE MOUNTING.	
6	INSPECT THE LUBRICATOR SPILL VALVE AIR SUPPLY SPILL VALVE AIR SUPPLY HOSES FOR CONDITION & LEAKS.	
7	CHECK ALL (4) FOUR BLOWER MOTORS FOR VIBRATION, WORN SHAFT BEARINGS, SECURE MOUNTING & CONDITION OF ELECTRICAL WIRING.	
8	CHECK EXPANSION JOINTS (UPPER & LOWER) FOR HOLES, LEAKS OR LOSS OF AIR.	

Date: 10/31/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000013 / 133 P.M.#: 3000013 Date Scheduled: 10/25/21
========== Shift: Date Due. . . : 11/07/21

Craft	People	Clock#	Employee	Hours
ELECTRICIAN		16390	Gesquiere	2.00

Equipment: 301164 HOT BLAST Location: 03-001
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 301164 Hot Blast

ORDER/ITEM  

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA HOT BLAST 301164 MONTHLY PM		
	IF ALIGNED FOR CUPOLA RECUPERATIVE BLAST, ONLY STEPS 1 ,3,4,11,12,13 & 14 CAN BE PERFORMED. ANNOTATE ON COVER SHEET "BLAST ALIGNMENT"	**OK WOW**
1	REMOVE ALL POWER FROM THE (3) HOT BLAST PANELS & LOCK OUT MAIN DISCONNECT.	
2	BLOW DOWN ALL BURNER ASSEMBLIES & GAS LINES.	
3	CLEAN UP THE (3) HOT BLAST PANELS & ENSURE ELECTRICAL PRINT IS IN CABINET.	
4	CHECK STARTER CONTACTS, RELAYS, FIRE EYE UNIT & CLEAN FIRE EYE SCANNERS, ALSO CHECK ALL ASSOCIATED WIRING & CONNECTIONS.	
5	APPLY POWER TO HOT BLAST SYSTEM	
6	START HOT BLAST SYSTEM A. CHECK FOR PROPER BURNER OPERATIOIN B. CHECK ALL THERMOCOUPLES. C. CHECK ALL LAMP INDICATORS. 1. ON PANELS IN BLOWER ROOM 2. ON PANEL IN CUPOLA CONTROL ROOM	
7	SIMULATE AN OVER TEMPERATURE CONDITION ON EACH OF THE (4) HOTBLAST SYSTEMS. A. HOT BLAST WILL BE SHUT OFF WHEN OVER TEMPERATURE OCCURS B. CHECK GAS FLOW MAGNAHELIC TO ENSURE GAS FLOW STOPS.	
8	SIMULATE A NO AIR FLOW CONDITION ON EACH OF THE (4) HOT BLAST SYSTEMS. A. HOT BLAST WILL BE SHUT OFF WHEN A NO AIR FLOW CONDITION EXISTS B. CHECK GAS FLOW MAGNAHELIC TO ENSURE GAS FLOW STOPS.	
9	CHECK HOT BLAST TEMPERATURE VIEWING SCREENS IN CUPOLA CONTROL ROOM FOR PROPER TEMPERATURE INDICATIONS.	
10	CHECK FOR AIR LEAKAGE ON THE (4) MAGNAHELIC INSTRUMENTS & ASSOCIATED AIR LINES.	
11	CHECK ALL AIR PRESSURE SWITCHES TO SEE IF THEY ARE SET PROPERLY. SHOULD BE SET AT (4) FOUR (INCHES OF WATER)	
12	INSPECT ALL THERMOCOUPLES FOR CONDITIOIN & OPERATION.	
13	CLEAN FIRE-EYE OF ALL DUST, OIL & FILM (4 UNITS)	
14	CHECK PIPING, VALVES, REGULATORS, ETC, FOR GAS LEAKS	
15	CHECK ALL MECHANICAL & ELECTRICAL INTERLOCKS ON COMBUSTION GAS TRAIN	

Date: 10/31/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000016 / 592 P.M.#: 3000016 Date Scheduled: 11/01/21
========== Shift: Date Due. . . : 11/10/21

Craft	People	Clock#	Employee	Hours
ELECTRICIAN		16390	Gesquiere	1.00

Equipment: 301176 CUPOLA WATER RECYCLE SYSTEM Location: 03-001
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Weekly - 301176 Cupola Water Recycl

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA
CUPOLA WATER RECYCLE SYSTEM 301176 WEEKLY PM

RECORD VALUES BELOW, CONTACT SUPERVISOR IF OUT OF RANGE

1. CUPOLA TOWER: HOT WELL TEMPERATURE (LESS THAN 110 DEGREES)_____
2. COLD WELL TEMPERATURE (70-90 DEGREES)_____
3. WATER CONDUCTIVITY _____
4. CHEMICAL TANK LEVEL, GENGARD GN8118 _____

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000015 / 342 P.M.#: 3000015 Date Scheduled: 10/25/21
========== Shift: Date Due. . . : 11/03/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		12213	Skoglund	1.00

Equipment: 301176 CUPOLA WATER RECYCLE SYSTEM Location: 03-001
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Bi-wkly- 301176 Cupola Water Recycl

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA CUPOLA WATER RECYCLE SYSTEM 301176 BI-WEEKLY PM		
		OK WOW
1	INSPECT ENTIRE SYSTEM FOR LEAKS	
2	INSPECT COOLING TOWER DRAIN FOR BUILD UP OF DIRT.	
3	INSPECT THE FILL AREA OF THE COOLING TOWER FOR DIRT & SCALE BUILD UP OVER NOZZLES	
4	VISUALLY INSPECT COOLING TOWER FAN MOTOR FOR SECURE MOUNTING & PROPER OPERATION.	
5	INSPECT SUPOLA MOAT DRAIN SCREENS FOR PLUGGING & PROPER SEATING	
6	VISUALLY INSPECT DRIVE, DRIVEN SHEAVES & BELTS FOR WEAR	
7	REMOVE & CLEAN STRAINER SCREEN ON MARLEY DISCHARGE PIPE.	
8	RUN SECONDARY CUPOLA WATER RECYCLE PUMP. VERIFY FLOW AND RECORD THE GALLONS PER MINUTE _____	

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000966 / 6
==========
P.M.#: 3000966
Shift:

Date Scheduled: 10/17/21
Date Due. . . : 10/31/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		12213	Skoglund	1.00

Equipment: 301280 Cupola Stack&Sprays-Inc.Pumps Location: 03-001
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: MNTH-Cupola Stack&Sprays-Inc. Pumps

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA CUPOLA STACK & SPRAYS-INC PUMPS 301280 MONTHLY PM		
		OK WOW
1	INSPECT PUMP TO MOTOR COUPLING FOR WEAR	
2	CHECK PUMP FOR CONDITION AND PACKING LEAKAGE.	
3	INSPECT PIPING FOR LEAKS	
4	CHECK AIR PRESSURE, 40 PSI MIN FOR ATOMIZING AIR	
5	REMOVE SPRAY HEADS FROM CUPOLA AND TEST.	
6	VERIFY THAT BOTH AIR AND WATER VALVES ARE WORKING PROPERLY.	
7	VERIFY THAT SPRAY IS A MIST.	

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000024 / 134
==========

P.M.#: 3000024

Shift:

Date Scheduled: 10/25/21
Date Due. . . : 11/07/21

Craft	People	Clock#	Employee	Hours
ELECTRICIAN		16390	Gesquiere	2.00

Equipment: 301298 Cupola 2007

Location: 03-001

Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 301298 Cupola 2007

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA CUPOLA 2007 301298 MONTHLY PM		
		OK WOW
1	CHECK ALL MECHANICAL & ELECTRICAL INTERLOCKS ON COMBUSTION GAS TRAIN A. SHUT OFF COMBUSTION BLOWER MOTOR & CHECK TO SEE IF FLAME GOES OUT B. SHUT MAIN GAS OFF & CHECK IF BLOCKING VALVE IS WORKING. C. DISCONNECT SCANNER TO SEE IF MAIN GAS GOES ON.	
2	CHECK AMPS ON CUMBUSTION BLOWER (RECORD) _____	
3	CHECK GENERAL CONDITION OF CONTROL PANEL A. CHECK ALL COMPONENTS ARE SECURE. B. CHECK WIRE CONDITION.	
4	CHECK PIPING, VALVES, REGULATORS, ETC, FOR GAS LEAKS	
5	CHECK PHYSICAL APPEARANCE OF CUPOLA, CHECK FOR HOLES, CRACKS, AND ABNORMAL APPEARANCE. NOTIFY MAINTENANCE SUPERVISOR IF HOLES OR CRACKS ARE FOUND.	

Date: 11/01/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: / P.M.#: 3000979 Date Scheduled: 00/00/00
========== Shift: Date Due. . . : 00/00/00

Craft	People	Clock#	Employee	Hours
MECHANICAL		12213	Skoglund	.50

Equipment: 301298 Cupola 2007 Location: 03-001
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: 301298 - CUPOLA 2017

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA CUPOLA 2007 301298 MONTHLY PM		
		OK WOW
1	CHECK CAP FOR PROPER SEALING	
2	CHECK EXPANSION JOINT FOR LEAKAGE	

Remarks:

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000025 / 267
==========

P.M.#: 3000025
Shift:

Date Scheduled: 10/25/21
Date Due. . . : 11/03/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		12213	Skoglund	.20

Equipment: 301298 Cupola 2007
Location: 03-001
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Bi-Weekly - 301298 Cupola 2007

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA CUPOLA 2007 301298 BI-WEEKLY PM		
		OK WOW
1	CHECK OILER LUBRICANT LEVEL FOR CAP LIFT CYLINDER (LIGHT OIL)	

Remarks:

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000027 / 265 P.M.#: 3000027 Date Scheduled: 09/13/21
========== Shift: Date Due. . . : 09/22/21

Craft	People	Clock#	Employee	Hours
ELECTRICIAN		16390	Gesquiere	1.00

Equipment: 301421 Comb Blower/Afterburn/Gas Train Location: 03-001
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Bi-Weekly - 301421 Combustin Blower

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P009 CUPOLA COMBO BLOWER/AFTERBURNER/GAS TRAIN BI-WEEKLY 301421 PM		
		OK WOW
1	CLEAN UNIT OFF	
2	CHECK MOTORS TO SEE IF JUNCTION BOX IS TIGHT & IT IS SECURELY MOUNTED	
3	CLEAN MOTORS	
4	CHECK ALL MECHANICAL & ELECTRICAL INTERLOCKS ON COMBUSTION GAS TRAIN FOR BOTH AFTERBURNERS. (LOCATED ON CHARGE FLOOR)	
5	CHECK PIPING, VALVES, REGULATORS, ETC, FOR GAS LEAKS	
6	CLEAN IGNITORS AND FLAME SENSORS	

Remarks:

Spare or Replacement Parts Stocked

EU-P009 Cupola

324644 Cupola Baghouse

Spare Filter bags/Hardware, Bag shaker motors & gearboxes, Large and Small Dampers & accessories, air cylinders, Mac valves, Wheels for sleds, Arms and Turnbuckles for sleds, Bearings, Gauge Magnehelic, Gearbox auger, Motor Electrical Auger, Belts, Vibrator

324647 Baghouse Blower

Drive Motor, Belts, Fan, Shaft, Bearings, Housing, Expansion Joint

324648 Quencher Baghouse

Nozzles, Piping, Hose, Asco Valves, Pump, Pump Motor

324704 Furness Process

Air Hose, Bearings, Auger, Gearbox, Gearbox Motor, Drive Coupling,

301164 Hot Blast

Actuator Electric Motor, Adhesive Hi-temp, Auxiliary Contact Block, Bearings, Boot Joint, Card Output, Ceramic Paper, Chassis Fire Eye, Connector Cable, Controller Fire Eye, Cylinder Hydraulic, Drive Phase 3HP, Filter Element Air, Gauge Gas Pressure, Gauge Magnehelic, Hose Hot Blast, Igniter Electrical, Igniter Flame Rod, Joint Expansion, Motor Electric Thermocouple, Transformer Ignition, Transmitter, Valve Solenoid.

301176 Cupola Water Recycle System

Coil AC Operating, Coil Valve, Cupola Recycle Seal Kit, Flange Coupling Assembly, Flow Meter, Flow Sensor, Flowmeter Cool Point, Gasket Pump, Gland Pump, Hub Flexible Coupling, Liquid Level Transmitter, Motor AC, Mount Rubber Ring Red, Pump Flange Rotary, Pump Hydraulic, Pump Slurry, Seal Pump, Flow Switch, Valves.

301280 Cupola Stack & Sprays

Arm Limit Switch, Coupling, Drive 3 Phase, Gauge Air, Module Analog Input, Nipple King Comb, Packing Pump, Pump High Head Circulation, Regulator, Sprayer Stack, Switch Limit, Thermocouple, Valve, Water Sediment Filter.

301298 Cupola 2007

Afterburner Body Assy, Arm Limit Switch, Bushing Water Cooled, Cable Communication, Cable Ethernet, Camera, Chassis PLC 17 Slot, Card Logix Relay, Compression Lug, Controller, Cupola Thermocouple, EZ Touch Complete Unit, Flow Sensor, Flow Meter, Gasket Expansion Joint, Gauge Pressure, Igniter Electrical, Motor Electrical AC, Nozzle Spray, Power Supply, Probe Tip, Pump Chemical Metering, Relay Timer, Thermocouple, Unilet, Valve Ball, Valve Gate, Water Gland Rubber.

301421 Comb Blower/Afterburn/Gas Train

Control VF560532AA, Filter Gas Regulator, Igniter Electrical, Lamp Analyzer, Motor 15HP, Sensor Flam UV1A6, UV Scanner Stack Burner

EU-P012

Title V Equipment Operating Ranges

Equipment Number	Check Equip	Range
324172	Motor Amps	122-137
Large Wet Dust Collector	Diff Pressure	2.0-4.0

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000434 / 134
==========

P.M.#: 3000434
Shift:

Date Scheduled: 10/24/21
Date Due. . . : 11/07/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	1.50

Equipment: 324172 Large Sch. Dust Collector Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 324172 Schneible Dust Col

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P012 MAIN PLANT SAND SYSTEM Large Wet Collector 324172 Monthly PM		
		OK WOW
1	INSPECT THE MUD CHAIN LINKS AND FLITES FOR PROPER OPERATION OF PINS, LINKS, LENGTH, AND STRAIGHTNESS	
2	VISUALLY INSPECT THE MUD CHAIN DRIVE SHAFT SPROCKETS FOR PROPER OPERATION & SECURE MOUNTING	
3	VISUALLY INSPECT THE MUD CHAIN DRIVE SHAFT TAKE-UP BEARINGS FOR PROPER ADJUSTMENT & SECURE MOUNTING	
4	INSPECT THE MUD CHAIN DRIVE ROLLER CHAIN FOR PROPER OPERATION, TENSION, & ALIGNMENT	
5	GREASE TAKE UP BEARINGS ON DRIVE SHAFT	
6	LUBRICATE ROLLER CHAIN ON DRIVE UNIT (JAX CHAIN LUBE)	
7	INSPECT ENTIRE DUCT WORK SYSTEM ON TOP-BOTTOM & SIDES FOR LEAKS	
8	CHECK ANY EXPANSION JOINTS FOR TEARS OR LEAKS	
9	CHECK FOR OUT OF BALANCE CONDITION	
10	INSPECT THE INSIDE OF THE COLLECTOR FOR LOOSE PLATE SECTIONS, REPORT FINDINGS	
11	INSPECT THE INSIDE OF COLLECTOR FOR DIRT-BUILD UP	
12	INSPECT ALL DUCTS FOR BUILD-UP	
13	INSPECT THE BLOWER DRIVE SHAFT BEARINGS FOR SECURE MOUNTING & SECURE SET SCREWS & GREASE	
14	INSPECT BLOWER V-BELTS FOR CONDITION & PROPER TENSION, OPERATION & ALIGNMENT	
15	CLEAN PROBES & CHECK CONDITION OF WIRING	
16	INSPECT TOWER TANK, SLUDGE TANK, CAPTURE SYSTEM, FAN FOR APPEARANCE, HOLES, CRACKS ANY ABNORMAL DEFECTS.	
17	EACH MONTH CHECK HORIZONTAL SECTIONS OF DUCT WORK FOR ANY FINES BUILD UP. REPORT BUILD UP OVER 15% OF DUCT DIAMETER TO SUPERVISOR.	

Remarks:

Spare or Replacement Parts Stocked

EU-P012 Main Plant Sand System

Actuator Mechanical, Bearings, Chain, Sprockets for Tank, Flight Angle, Gauge Magnehelic, Gear Reducer, Blower Motor, Belts, Pump Water, Chain Sludge Tank, Shafts Sludge Tank

EU-P014

Title V Equipment Operating Ranges

Equipment Number	Check Equip	Range
324128	Motor Amps	120-140
West Fuller	Diff Pressure	5.0-7.0

324132	Motor Amps	100-120
East Fuller	Diff Pressure	5.0-7.0

324866	Motor Amps	145-165
Clean Rm Steelcraft	Diff Pressure	3.5-5.5

Date: 10/31/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000484 / 138 P.M.#: 3000484 Date Scheduled: 10/03/21
========== Shift: Date Due. . . : 11/03/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	2.00

Equipment: 324866 SteelCraft Dust Collect Cln Rm Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 324866 SteelCraft Dust Co

NEED 4 WEEKS TO COMPLETE THIS PM. SET DUE DATE ACCORDINGLY

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P014 Main Plant Finishing
Cleaning Room Dust Collector 324866 Monthly PM

Step	Check or perform the following Weekly	Week 1	Week 2	Week 3	Week 4
W1.	Check the blower shaft pillow block bearings for wear, loose set screws or locking collars and normal temperature				
W2.	Observe the unit (while running) for vibration and noise				
W3.	Inspect for evidence of leakage from ducts, expansion joints and collector housing				
W4.	Inspect housings for wear and leakage on both fines' augers and rotary air lock				
W5.	Grease bearings for the collector pup auger .				
W6.	Make sure collector gets shut down and emptied.				

Step	Check or perform the following once during the month	OK	WOW
M1.	Inspect unit structure, expansion joint, hinges, latches and guards for integrity		
M2.	Inspect condition and alignment of belts and sheaves on the blower drive		
M3.	Inspect motor mounting and condition of electrical supply wiring		
M4.	Inspect pulse piping, regulators, valves and fittings for leaks		
M5.	Inspect all blower flange and pillow block bearings for wear and loose set screws or locking collars		
M6.	Grease the blower pillow block bearings		
M7.	Check oil level in the fines' auger gear boxes		
M8.	Check condition, tension and alignment of belts and sheaves on the fines' auger drives		
M9.	Inspect the drive, chain and sprockets on the rotary air lock		
M10.	<u>January, April, July, October only</u>: Perform Vis-o-lite test		

Remarks:

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000814 / 30
==========

P.M.#: 3000814
Shift:

Date Scheduled: 10/24/21
Date Due. . . : 11/07/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	1.00

Equipment: 324866 SteelCraft Dust Collect Cln Rm Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: MONTHLY 324866 CLN RM STEELCR

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

Monthly Inspection of Cleaning Room Steelcraft Dust Collector Horizontal Ducts

Inspect the horizontal sections of all duct work using the doors installed throughout. Refer to the attached map for door location and document results in the table below					
Door	**Service**	**Duct Diameter**	**15% Max Depth**	**Actual Depth**	**Initials**
1	Main Trunk Between Eastern Roof Penetrations	30”	6”		
2	Main Trunk Upstream East Roof Penetration	38”	8”		
3	Main Trunk Above #1 Wheelabrator Panel	38”	8”		
4	Main Trunk Downstream #1 Wheelabrator Branch	38”	8”		
5	Main Trunk Upstream #1 Wheelabrator Branch	38”	8”		
6	North End Main Trunk Above Cleaning Room Office	34”	7”		
7	South End Main Trunk Above Cleaning Room Office	34”	7”		
8	Main Trunk Above Main Forklift East/West Aisle	34”	7”		
9	North End Main Trunk Above North/South Aisle	34”	7”		
10	Main Trunk Downstream #4 Wheelabrator Branch	34”	7”		
11	West End Branch Trunk #4 Wheelabrator	18”	3.5”		
12	East End Branch Trunk #4 Wheelabrator	18”	3.5”		
13	First Door Downstream #4 Wheelabrator	18”	3.5”		
14	Main Trunk Upstream #2 Wheelabrator Branch	24”	5”		
15	Main Trunk Downstream #3 and 5 Wheelabrator	24”	5”		
16	Last Door #3 Wheelabrator Branch	18”	3.5”		
17	West End #3 Wheelabrator Branch	18”	3.5”		
18	East End #3 Wheelabrator Branch	18”	3.5”		
19	East End #5 Wheelabrator Branch	18”	3.5”		
20	West End #5 Wheelabrator Branch	18”	3.5”		
21	First Door Downstream #5 Wheelabrator Branch	18”	3.5”		

1. Main Fan must be locked off to perform this check.
2. Measure the buildup observed at each door and compare to the max depth listed in the table above. Record the actual depth observed in inches and circle in ***RED*** ink any measurements that meet or exceed the maximum depth allowed.

3. Depths measured or observed that are less than the Max Depth listed above shall be cleaned to less than 1" depth and reported to the Maintenance and Cleaning Room Lead/Supervisor/Managers.
4. Depths measured or observed that exceed the Max Depth listed above must ***IMMEDIATELY*** be brought to the attention of the Cleaning Room Lead/Supervisor/Manager, Maintenance Lead/Supervisor/Manager and Plant Manager. A plan to mitigate will need to be created to restart the system.
5. The person initialing verifies the inspection has been performed by personal observation.

Date: 10/31/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000423 / 133
==========

P.M.#: 3000423
Shift:

Date Scheduled: 10/25/21
Date Due. . . : 11/07/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	2.50

Equipment: 324128 W Fuller Dust Collector Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 324128 West Fuller Dust C

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P014 MAIN PLANT FINISHING WEST FULLER 324128 Monthly PM		
		OK WOW
1	INSPECT MAIN SAFETY SWITCH TO MOTOR FOR DAMAGE, BAD WIRES & LOOSENESS	
2	INSPECT DRIVE MOTOR BASE FOR LOOSES BOLTS OR MOUNTS	
3	INSPECT BLOWER SHAFT BEARINGS FOR LOOSE BOLTS ON BEARING BASE & CAP	
4	OPEN HATCH ON BLOWER AND INSPECT FAN BLADES FOR CRACKS & PROPER OPERATION	
5	INSPECT BLOWER DRIVE BELTS FOR PROPER ALIGNMENT AND PROPER TENSION	
6	CHECK BLOWER FOR UNBALANCED CONDITION	
7	WITH THE DUST COLLECTOR ON, TEST THE INDIVIDUAL PULSE DAMPER CYLINDERS ON ALL 7 SECTIONS.	
8	INSPECT ENTIRE DUCT WORK SUSTEM ON TOP-BOTTOM & SIDES FOR LEAKS	
9	CHECK ANY EXPANSION JOINTS FOR TEARS OR LEAKS	
10	GREASE DUST COLLECTOR FAN DRIVE BEARINGS	
11	GREASE ROTARY DISHCHARGE VALVE	
12	GREASE DISCHARGE AUGER BEARINGS	
13	CHECK OIL LEVEL IN DISCHARGE AUGER GEARBOX	
14	FILL LUBRICATOR FOR DAMPER CYLINDERS	
15	INSPECT THE ENTIRE UNIT FOR CRACKS & DUST LEAKS	
16	CHECK THE ENTIRE UNIT FOR COMPRESSED AIR LEAKS. PULSE VALVES, AIR LINES, TANKS,ETC	
17	CHECK PHYSICAL APPEARANCE OF COLLECTOR AND DUCT WORK FOR HOLES, CRACKS, ANY ABNORMAL DEFECT.	
18	LEAK CHECK, VISUOLITE AND CHECK FILTER BAGS FOR LEAKS, JAN, APRIL, JULY, OCTOBER	
19	EACH MONTH CHECK HORIZONTAL SECTIONS OF DUCT WORK FOR ANY FINES BUILD UP. REPORT BUILD UP OVER 15% OF DUCT DIAMETER TO SUPERVISOR.	

Date: 10/31/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000426 / 133 P.M.#: 3000426 Date Scheduled: 10/25/21
Shift: Date Due. . . : 11/07/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	2.50

Equipment: 324132 E Fuller Dust Collector Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 324132 East Fuller Dust C

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P014 MAIN PLANT FINISHING EAST FULLER 324132 Monthly PM		
		OK WOW
1	INSPECT MAIN SAFETY SWITCH TO MOTOR FOR DAMAGE, BAD WIRES & LOOSENESS	
2	INSPECT DRIVE MOTOR BASE FOR LOOSES BOLTS OR MOUNTS	
3	INSPECT BLOWER SHAFT BEARINGS FOR LOOSE BOLTS ON BEARING BASE & CAP	
4	OPEN HATCH ON BLOWER AND INSPECT FAN BLADES FOR CRACKS & PROPER OPERATION	
5	INSPECT BLOWER DRIVE BELTS FOR PROPER ALIGNMENT AND PROPER TENSION	
6	CHECK BLOWER FOR UNBALANCED CONDITION	
7	WITH THE DUST COLLECTOR OFF, TEST THE INDIVIDUAL PULSE DAMPER CYLINDERS ON ALL 7 SECTIONS, OPEN THE HATCH AND WATH EACH CYLINDER WORK	
8	INSPECT ENTIRE DUCT WORK SUSTEM ON TOP-BOTTOM & SIDES FOR LEAKS	
9	CHECK ANY EXPANSION JOINTS FOR TEARS OR LEAKS	
10	CHECK DROPOUTS FOR LEAKS & INSPECT INSIDE DEFLECTOR PLATE FOR PROPER OPERATION & THAT DROP TUBE IS NOT PLUGGED	
11	GREASE DUST COLLECTOR FAN DRIVE BEARINGS	
12	GREASE ROTARY DISHCHARGE VALVE	
13	GREASE DISCHARGE AUGER BEARINGS	
14	CHECK OIL LEVEL IN DISCHARGE AUGER GEARBOX	
15	FILL LUBRICATOR FOR DAMPER CYLINDERS	
16	INSPECT THE ENTIRE UNIT FOR CRACKS & DUST LEAKS	
17	CHECK THE ENTIRE UNIT FOR COMPRESSED AIR LEAKS. PULSE VALVES, AIR LINES, TANKS,ETC	
18	CHECK PHYSICAL APPEARANCE OF COLLECTOR AND DUCT WORK FOR HOLES, CRACKS, ANY ABNORMAL DEFECT.	
19	LEAK CHECK, VISUOLITE AND CHECK FILTER BAGS FOR LEAKS, JAN, APRIL, JULY, OCTOBER	
20	EACH MONTH CHECK HORIZONTAL SECTIONS OF DUCT WORK FOR ANY FINES BUILD UP. REPORT BUILD UP OVER 15% OF DUCT DIAMETER TO SUPERVISOR.	

Spare or Replacement Parts Stocked

EU-P014 Main Plant Finishing

Board Timer, Bushing Sheave, Bushing Taperlock, Cage Bag, Diaphragm Main Air, Cylinder Linear, Filter Bags, Gauge Air, Kit Valve Repair, Meter, Motor Blower, Motor Auger, Gearbox Auger, Airlock, Magnehelic Gauge, Belts, Asco Valves for Pulse, Bearings

Date: 11/01/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: / P.M.#: 3000410 Date Scheduled: 00/00/00
========== Shift: Date Due. . . : 00/00/00

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	4.00

Equipment: 324055 Env Maint Misc Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 324055 MAIN PLANT P/C

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P016 Main Plant Pouring Cooling #6 Hunter Cooling Conveyor Exhaust 324636 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

EU-P016 Main Plant Pouring Cooling #6 Hunter Turn Table Exhaust 324632 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

EU-P016 Main Plant Pouring Cooling #7 Hunter Turn Table Exhaust 324662 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

EU-P016 Main Plant Pouring Cooling #7 Hunter Hot Belt Exhaust Fan Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

EU-P016 Main Plant Pouring Cooling Disa Forma Cooling Conveyor Exhaust 324678 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

EU-P016 Main Plant Pouring Cooling Disa Forma Cooling Conveyor Exhaust 324682 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

EU-P016 Main Plant Pouring Cooling Disa Forma Cooling Conveyor Exhaust 324484 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

EU-P016 Main Plant Pouring Cooling #5 Hunter Turn Table Exhaust 324848 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

EU-P016 Main Plant Pouring Cooling #5 Hunter Hot Belt Exhaust 324844 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

Spare & Replacement Parts on Hand

EU-P016 Main Plant Pouring and Cooling

Sheaves, Belts, Bearings

EU-P018

Title V Equipment Operating Ranges

Equipment Number	Check Equip	Range
324373	Motor Amp	175-210
IM Torit Collector	Diff Pressure	1”-6” w.c.

324867	Motor Amp	55-85
Linsmeyer Collector	Diff Pressure	3”-7” w.c.

Date: 10/31/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000926 / 32 P.M.#: 3000926 Date Scheduled: 10/03/21
========== Shift: Date Due. . . : 11/03/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	.50

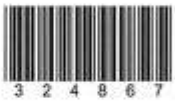
Equipment: 324867 KNOCK OFF DUST COLLECTOR CLN RM Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Mnth/Wk 324867 Lindsmeyer Collecter

SECTION TWO IS TO BE PERFORMED THE 3RD SUNDAY OF THE MONTH
Due date to be end of month (Extend 4 weeks)

ORDER/ITEM

EQ#



JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P018
LINDSMEYER 324867 Monthly PM

Step	Check or perform the following Weekly	Week 1	Week 2	Week 3	Week 4
W1.	Check the blower shaft pillow block bearings for wear, loose set screws or locking collars and normal temperature				
W2.	Observe the unit (while running) for vibration and noise				
W3.	Inspect for evidence of leakage from ducts, expansion joints and collector housing				
W4.	Inspect housings for wear and leakage on discharge auger				

Step	Check or perform the following once during the month	OK	WOW
M1.	Inspect unit structure, fan, expansion joint, hinges, latches and guards for integrity		
M2.	Inspect condition and alignment of belts and sheaves on the blower drive		
M3.	Inspect motor mounting and condition of electrical supply wiring		
M4.	Inspect pulse piping, regulators, valves and fittings for leaks		
M5.	Inspect all blower flange and pillow block bearings for wear and loose set screws or locking collars		
M6.	Grease the blower pillow block bearings		
M7.	Check oil level in the fines' auger gear box.		
M8.	Check condition, tension and alignment of belts and sheaves on the fines' auger drives		
M9.	Inspect the auger gearbox and motor, belts.		
M10.	<u>January, April, July, October only</u>: Perform Vis-o-lite test		
M11	EACH MONTH CHECK HORIZONTAL SECTIONS OF DUCT WORK FOR ANY FINES BUILD UP. REPORT BUILD UP OVER 15% OF DUCT DIAMETER TO SUPERVISOR.		

Remarks:

Date: 10/31/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000928 / 62 P.M.#: 3000928 Date Scheduled: 10/24/21
Shift: Date Due. . . : 11/07/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	.50

Equipment: 324373 IM TORIT DUST COLLECTOR Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: MONTHLY - 324373 IM TORRIT DUST

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P018 Main Plant Shakeout
IM Torit 324373 Monthly PM

Step	Check or perform the following Weekly	Week 1	Week 2	Week 3	Week 4
W1.	Check the blower shaft pillow block bearings for wear, loose set screws, normal temperature, grease bearings				
W2.	Observe the unit (while running) for vibration and noise				
W3.	Inspect drive motor mountings & wiring condition				
W4.	Clean or replace intake air filter on PD Blower				
W5.	Check for proper operation of pulse system.				
W6	Check belt for wear and tightness on PD Blower				

Step	Check or perform the following once during the month	OK	WOW
M1.	Check condition of the clean air section for dust		
M2.	Check seal on door, and adjust or replace as necessary		
M3.	Check chain tension on upper pulse arm drive		
M4.	Check auger gear motor lubricant level		
M5.	Check condition of blower drive belts and sheaves and tension		
M6.	Check lower pivot bearing on pulse arm		
M7.	Check upper pivot bearing on pulse arm		
M8.	Check gearbox oil level on pulse arm		
M9.	Inspect unit structure, fan, hinges, latches and guards for integrity		
M10.	Leak Inspection, visuolite and check filters bags for leaks Jan, April, July, October.		
M11.	EACH MONTH CHECK HORIZONTAL SECTIONS OF DUCT WORK FOR ANY FINES BUILD UP. REPORT BUILD UP OVER 15% OF DUCT DIAMETER TO SUPERVISOR.		

Remarks:

Spare or Replacement Parts Stocked

EU-P014 Main Plant Finishing

Board Timer, Bushing Sheave, Bushing Taperlock, Cage Bag, Diaphragm Main Air, Cylinder Linear, Filter Bags, Gauge Air, Kit Valve Repair, Meter, Motor Blower, Motor Auger, Gearbox Auger, Airlock, Magnehelic Gauge, Belts, Asco Valves for Pulse, Bearings

EU-P021

Title V Equipment Operating Ranges

Equipment Number	Check Equip	Range
324745	PH	0-4.5
Isocure Scrubber	Flowrate	50-75 gpm

Date: 11/01/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000480 / 25 P.M.#: 3000480 Date Scheduled: 10/24/21
========== Shift: Date Due. . . : 11/07/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	.50

Equipment: 324745 Iso B&P Scrubber Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly-324745 Iso B&P Scrubber

ORDER/ITEM  

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P021 Isocure Isocure B&P Scrubber Monthly PM					
Step	**Check or perform the following Weekly**	**Week 1**	**Week 2**	**Week 3**	**Week 4**
W1.	Drain, Clean, Refill & Charge every weekend				
W2.	Observe the unit (while running) for vibration and noise				
W3.	Inspect for evidence of leakage from ducts, expansion joints and collector housing				
W4.	Inspect Pump for leakage				
W5.	Tighten probe grommets nuts on PH, water level & conductivity probes.				
W6	Wipe clean PH probe				

Step	**Check or perform the following once during the month**	**OK**	**WOW**
M1.	Inspect unit structure, fan, expansion joint, hinges, latches and guards for integrity		
M2.	Inspect ductwork for corrosion		
M3.	Check for buildup in duct work, clean as necessary		

Date: 11/01/21 **Grede Iron Mountain**

WORK ORDER SHEET

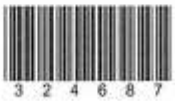
W.O./Item#: / P.M.#: 3000470 Date Scheduled: 00/00/00
========== Shift: Date Due. . . : 00/00/00

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	5.00

Equipment: 324687 DUST COLLECTOR Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: MONTHLY-324687 - ISO DUST COLLECTOR

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P021 Isocure
Isocure Process Dust Collector Monthly PM

Step	Check or perform the following Weekly	Week 1	Week 2	Week 3	Week 4
W1.	Check the blower shaft pillow block bearings for wear, loose set screws or locking collars and normal temperature				
W2.	Observe the unit (while running) for vibration and noise				
W3.	Inspect for evidence of leakage from ducts, expansion joints and collector housing				
W4.	Make sure collector gets shut down and emptied.				

Step	Check or perform the following once during the month	OK	WOW
M1.	Inspect unit structure, fan, expansion joint, hinges, latches and guards for integrity		
M2.	Inspect condition and alignment of belts and sheaves on the blower drive		
M3.	Inspect motor mounting and condition of electrical supply wiring		
M4.	Inspect pulse piping, regulators, valves and fittings for leaks		
M5.	Inspect all blower flange and pillow block bearings for wear and loose set screws or locking collars		
M6.	Grease the blower pillow block bearings		
M7.	January, April, July, October only: Perform Vis-o-lite test		

Remarks:

Date: 11/01/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000455 / 272 P.M.#: 3000455 Date Scheduled: 10/24/21
========== Shift: Date Due. . . : 11/03/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	1.00

Equipment: 324596 Iso Scrubber Backup Blower N Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Bi-Weekly - 324596 Scrubber Backup

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P021 ISOCURE ISOCURE SCRUBBER BLOWER NORTH 324596 WEEKLY PM		
		OK WOW
1	GREASE BEARINGS ON FAN SHAFT	
2	INSPECT DRIVE BELTS, DRIVE SHEAVES, AND DRIVEN SHEAVES FOR WEAR	
3	INSPECT MOTOR WIRE CONNECTIONS FOR DEFECT	
4	ENSURE ALL MACHINE GUARDS ARE IN PLACE AND FUNCTIONAL	
5	INSPECT CONDITION OF BLADES, HOUSING, GUARDS	
6	REPORT ANY NOISE OR VIBRATION	
7	CHECK TIGHTNESS OF THE SET SCREWS TO THE BLOWER SHAFT	

**RECORD AND DEFECTIVE OR NON-OPERATING FANS AND REPORT TO SUPERVISOR IN ADDITION TO A WRITTEN WORK ORDER.

Remarks:

Date: 11/01/21 **Grede Iron Mountain**

WORK ORDER SHEET

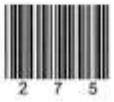
W.O./Item#: 3000456 / 275 P.M.#: 3000456 Date Scheduled: 10/17/21
========== Shift: Date Due. . . : 10/27/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	1.00

Equipment: 324598 Iso Scrubber Blower S. Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Bi-Weekly - 324598 Isocure Scrubber

ORDER/ITEM



EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P021 ISOCURE ISOCURE SCRUBBER BLOWER SOUTH 324598 WEEKLY PM		
		OK WOW
1	GREASE BEARINGS ON FAN SHAFT	
2	INSPECT DRIVE BELTS, DRIVE SHEAVES, AND DRIVEN SHEAVES FOR WEAR	
3	INSPECT MOTOR WIRE CONNECTIONS FOR DEFECT	
4	ENSURE ALL MACHINE GUARDS ARE IN PLACE AND FUNCTIONAL	
5	INSPECT CONDITION OF BLADES, HOUSING, GUARDS	
6	REPORT ANY NOISE OR VIBRATION	
7	CHECK TIGHTNESS OF THE SET SCREWS TO THE BLOWER SHAFT	

**RECORD AND DEFECTIVE OR NON-OPERATING FANS AND REPORT TO SUPERVISOR IN ADDITION TO A WRITTEN WORK ORDER.

Remarks:

Spare & Replacement Parts on Hand

EU-P021 Isocure

Bearings Blower, Motor Blower, Belts, Filter Bags, Magnehelic Gauge, Acid Recycling Pump, Pump Circulating, Pump Rebuild Kit, Asco Valves, PH Probe, Level Sensor, Flow Sensor

EU-P032, EU-P034, EU-P038

Title V Equipment Operating Ranges

Equipment Number	Check Equip	Range
334102	Motor Amps	175-220
Module Torit Collector	Diff Pressure	1”-6” w.c.

Date: 11/01/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000865 / 53 P.M.#: 3000865 Date Scheduled: 10/11/21
Shift: Date Due. . . : 10/24/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	1.00

Equipment: 334102 MODULE TORIT DUST COLLECTOR Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: MONTHLY - 334102 - MODULE TORIT

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P032 Module Sand System,EU-P034 Module Finishing, EU-P038 Module Shakeout.
Module Torit 334102 Monthly PM

Step	Check or perform the following Weekly	Week 1	Week 2	Week 3	Week 4
W1.	Check the blower shaft pillow block bearings for wear, loose set screws, normal temperature, grease bearings				
W2.	Observe the unit (while running) for vibration and noise				
W3.	Inspect drive motor mountings & wiring condition				
W4.	Clean or replace intake air filter on PD Blower				
W5.	Check for proper operation of pulse system.				
W6	Check belt for wear and tightness on PD Blower				

Step	Check or perform the following once during the month	OK	WOW
M1.	Check condition of the clean air section for dust		
M2.	Check seal on door, and adjust or replace as necessary		
M3.	Check chain tension on upper pulse arm drive		
M4.	Check auger gear motor lubricant level		
M5.	Check condition of blower drive belts and sheaves and tension		
M6.	Check lower pivot bearing on pulse arm		
M7.	Check upper pivot bearing on pulse arm		
M8.	Check gearbox oil level on pulse arm		
M9.	Inspect unit structure, fan, hinges, latches and guards for integrity		
M10.	Leak Inspection, visuolite and check filters bags for leaks Jan, April, July, October.		
M11.	EACH MONTH CHECK HORIZONTAL SECTIONS OF DUCT WORK FOR ANY FINES BUILD UP. REPORT BUILD UP OVER 15% OF DUCT DIAMETER TO SUPERVISOR.		

Spare & Replacement Parts on Hand

EU-P032 Module Sand System, EU-P034 Module Finishing, EU-P038 Module Shakeout

Cage Bag, Diaphragm Main Air, Cylinder Linear, Filter Bags, Gauge Air, Kit Valve Repair, Meter, Motor Blower, Motor Auger, Gearbox Auger, Airlock, Magnehelic Gauge, Belts, Asco Valves for Pulse, Bearings

EU-P040

Title V Equipment Operating Ranges

Equipment Number	Check Equip	Range
324728	Motor Amps	110-160
Sand Steelcraft	Diff Pressure	3.5”-5.5” w.c.

Date: 11/01/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000474 / 139 P.M.#: 3000474 Date Scheduled: 10/03/21
========== Shift: Date Due. . . : 11/03/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	2.00

Equipment: 324728 60,000 CFM Collector Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 324728 60,000 CFM Collect

NEED 4 WEEKS TO COMPLETE THIS PM. SET DUE DATE ACCORDINGLY

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P040 Sand Conditioning System
Sand Conditioning Dust Collector 324728 Monthly PM

Step	Check or perform the following Weekly	Week 1	Week 2	Week 3	Week 4
W1.	Check the blower shaft pillow block bearings for wear, loose set screws or locking collars and normal temperature				
W2.	Observe the unit (while running) for vibration and noise				
W3.	Inspect for evidence of leakage from ducts, expansion joints and collector housing				
W4.	Inspect housings for wear and leakage on both fines' augers and rotary air locks				
W5.	Grease bearings augers				

Step	Check or perform the following once during the month	OK	WOW
M1.	Inspect unit structure, fan, expansion joint, hinges, latches, ductwork and guards for integrity		
M2.	Inspect condition and alignment of belts and sheaves on the blower drive		
M3.	Inspect motor mounting and condition of electrical supply wiring		
M4.	Inspect pulse piping, regulators, valves and fittings for leaks		
M5.	Inspect all blower flange and pillow block bearings for wear and loose set screws or locking collars		
M6.	Grease the blower pillow block bearings		
M7.	Check oil level in the fines' auger gear boxes		
M8.	Check condition, tension and alignment of belts and sheaves on the fines' auger drives		
M9.	Inspect the drive, chain and sprockets on the rotary air lock		
M10.	January, April, July, October only: Leak test: Perform Vis-o-lite test and check filter bags for leaks.		
M11.	EACH MONTH CHECK HORIZONTAL SECTIONS OF DUCT WORK FOR ANY FINES BUILD UP. REPORT BUILD UP OVER 15% OF DUCT DIAMETER TO SUPERVISOR.		

Remarks:

Spare & Replacement Parts on Hand

EU-P040 Sand Conditioning System

Board Timer, Bushing Sheave, Bushing Taperlock, Cage Bag, Diaphragm Main Air, Cylinder Linear, Filter Bags, Gauge Air, Kit Valve Repair, Meter, Motor Blower, Motor Auger, Gearbox Auger, Airlock, Magnehelic Gauge, Belts, Asco Valves for Pulse, Bearings

Date: 11/01/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: /
==========

P.M.#: 3000981
Shift:

Date Scheduled: 00/00/00
Date Due. . . : 00/00/00

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	1.00

Equipment: 334055 Mod Env Misc Maint Location: 03-034
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 334055 MODULE P/C LINE

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P036 Module Pouring Cooling Module Hunter Turn Table Exhaust 334116 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

EU-P036 Module Pouring Cooling Module Hunter Cooling Conveyor Exhaust 334128 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

EU-P036 Module Pouring Cooling Module Hunter Turn Table Exhaust 334176 Monthly PM		
		OK WOW
1	Inspect drive belts, drive sheaves and driven sheaves for wear.	
2	Inspect motor for mounting and wire connections for defects.	
3	Ensure all machine guards are in place and functional.	
4	Grease all bearings and inspect for wear.	
5	Inspect condition of fan blade	
6	Inspect condition of housing for defects.	
7	Report any noise or vibration.	

Remarks:

Spare & Replacement Parts on Hand

EU-P036 Module Pouring and Cooling

Belts, Sheaves, Bearings

Date: 11/01/21

Grede Iron Mountain

WORK ORDER SHEET

W.O./Item#: 3000457 / 70 P.M.#: 3000457 Date Scheduled: 11/01/21
Shift: Date Due. . . : 11/14/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	1.00

Equipment: 324612 Bond Tank Dust Collector Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Bi-Monthly - 324612 Bond Tank Dust

ORDER/ITEM 

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P041 Main Plant Bond Silo Bond Tank Dust Collector 324612 Monthly PM		
		OK WOW
1	Check oil in gearbox	
2	Inspect drive belt for damage	
3	Inspect drive & driven pulleys for excessive wear & proper alignment	
4	Grease pulley	
5	Lubricate eccentric pin, crank lever pin & shaft shaker end bearings with 10W30 oil or equivalent.	
6	Check for closing of hopper valve	
7	Check doors seals for proper sealing.	
8	Ensure all guards are in place and secure	
9	Check unit for cracks, holes, signs of leakage.	

Remarks:

Spare & Replacement Parts on Hand

EU-P041 Main Plant Bond Silo

Belts, Bearings, Filter Bags, AC Motor

Date: 11/01/21 **Grede Iron Mountain**

WORK ORDER SHEET

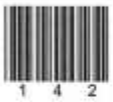
W.O./Item#: 3000738 / 142 P.M.#: 3000738 Date Scheduled: 10/10/21
========== Shift: Date Due. . . : 10/24/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		18098	Bozile	.50

Equipment: 334172 Flex-Kleen Dust Collector Location: 03-034
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly - 334172 Flex-Kleen Dust Co

ORDER/ITEM



EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P042 MODULE BOND SILO FLEX-KLEEN DUST COLLECTOR 334172 MONTHLY PM		
		OK WOW
1	CHECK ALL ASCO VALVES TO VERIFY THAT THEY ARE PULSING	
2	CHECK FILTERS FOR HOLES AND PROPER MOUNTING	
3	REMOVE FILTERS AND CLEAN OR REPLACE IF NEEDED	
4	CHECK PHYSICAL APPEARANCE OF UNIT AND DUCT WORK FOR HOLES, CRACKS, ABNORMAL DEFECTS.)	

Remarks:

Spare & Replacement Parts on Hand

EU-P042 Module Bond Silo

AC Motor, Belts, Bearings, Filter Bags, Asco Valves, Magnehelic Gauge

EU-P043

Title V Equipment Operating Ranges

Equipment Number	Check Equip	Range
334180	PH	0-4.5
Module Scrubber	Flowrate	25-45 gpm

Date: 11/01/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000743 / 405 P.M.#: 3000743 Date Scheduled: 10/03/21
========== Shift: Date Due. . . : 11/03/21

Craft	People	Clock#	Employee	Hours
NON MAINTENANCE		18098	Bozile	1.00

Equipment: 334180 GFE Scrubber Location: 03-034
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Monthly- 334180 GFE Scrubber Module

NEED 4 WEEKS TO COMPLETE THIS PM - SET DUE DATE ACCORDINGLY.

ORDER/ITEM  

EQ# 

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

EU-P043 Module Isocure
GFE Scrubber Module 334180 Monthly PM

Step	Check or perform the following Weekly	Week 1	Week 2	Week 3	Week 4
W1.	Drain scrubber solution, refill, run for 15 minutes, drain, refill & recharge				
W2.	Observe the unit (while running) for vibration and noise				
W3.	Inspect for evidence of leakage from ducts, expansion joints and collector housing				
W4.	Grease blower pillow block bearings				
W5.	Wipe clean PH probe				

Step	Check or perform the following once during the month	OK	WOW
M1.	Inspect unit structure, fan, expansion joint, hinges, latches, ductwork and guards for integrity		
M2.	Inspect condition and alignment of belts and sheaves on the blower drive		
M3.	Inspect motor mounting and condition of electrical supply wiring		
M4.	Inspect ductwork for corrosion		
M5.	Inspect all blower pillow block bearings for wear and loose set screws or locking collars		
M6.	Inspect condition of pump, piping, and valving		
M11.	EACH MONTH CHECK HORIZONTAL SECTIONS OF DUCT WORK FOR ANY FINES BUILD UP. REPORT BUILD UP OVER 15% OF DUCT DIAMETER TO SUPERVISOR.		

Remarks:

Spare & Replacement Parts on Hand

EU-P043 Module Isocure

Bearings Blower, Motor Blower, Belts, Magnehelic Gauge, Acid Recycling Pump, Pump Circulating, Pump Rebuild Kit, Asco Valves, PH Probe, Level Sensor, Flow Sensor

Date: 11/01/21 **Grede Iron Mountain**

WORK ORDER SHEET

W.O./Item#: 3000800 / 419 P.M.#: 3000800 Date Scheduled: 10/31/21
========== Shift: Date Due. . . : 11/10/21

Craft	People	Clock#	Employee	Hours
MECHANICAL		24517	White	14.00

Equipment: 324055 Env Maint Misc Location: 03-024
Job:
Priority: PRIORITY 10
Init. By:
Lube:
Contractor:

Description: Daily - Title "V" Daily Checks

ORDER/ITEM

EQ#

JOB CODE

---------- COMPLETION INFORMATION ----------

Completed By: _____ Date: _____

Meter Reading: _____ Hours: _____

Supervisor: _____

Remarks: _____

Grede Iron Mountain Daily Environmental Log for Week Ending:											
Equipment & Number		Min	Max	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Remarks
Baghouse 324644											
Motor Amps		115	281								
Differential Pressure		1" WC min									
Stack Temperature		1300F min									
Visual Inspection for Smoke		Non-Visible									
Check Duct Work from Baghouse to Cupola for visible emissions		Non-Visible									
Cupola 301298											
Visual Inspection for Smoke		Non-Visible									
IM Torit Collector 324373											
Motor Amps		175	210								
Differential Pressure		1" WC	6" WC								
Observe Stack Emissions		Dust Free									
Check outside duct work for visible emissions		Non-Visible									
Module Torit Collector 334102											
Motor Amps		175	220								
Differential Pressure		1" WC	6" WC								
Observe Stack Emissions		Dust Free									
Check outside duct work for visible emissions		Non-Visible									
Module Scrubber 334180 (GFE)											
3rd Shift	Flowrate (Gpm)	25	45								
	pH	0	4.5								
1st Shift	Flowrate (Gpm)	25	45								
	pH	0	4.5								

2nd Shift	Flowrate (Gpm)	25	45								
	pH	0	4.5								
Observe Stack Emissions		Dust & Odor Free									
Cleaning Room Collector 324866											
Motor Amps		145	165								
Differential Pressure		3.5” WC	5.5” WC								
Observe Stack Emissions		Dust & Odor Free									
Check outside duct work for visible emissions		Non-Visible									
Knock Off Collector (Linsmeyer) 324867											
Motor Amps		55	85								
Differential Pressure		3	7								
Observe Stack Emissions		Dust Free	Odor Free								
Check outside duct work for visible emissions		None	Visible								
East Fuller Collector 324132											
Motor Amps		100	120								
Differential Pressure		5” WC	7” WC								
Observe Stack Emissions		Dust Free									
Check outside duct work for visible emissions		Non-Visible									
West Fuller Collector 324128											
Motor Amps		120	140								
Differential Pressure		5” WC	7” WC								
Observe Stack Emissions		Dust Free									
Check outside duct work for visible emissions		Non-Visible									
Isocure Scrubber 324745											
	pH	0	4.5								

3rd Shift	Flowrate (GPM)	50	75								
1st Shift	pH	0	4.5								
	Flowrate (GPM)	50	75								
2nd Shift	pH	0	4.5								
	Flowrate (GPM)	50	75								
Observe Stack Emissions		Dust & Odor Free									
Sand System Collector 324728											
Motor Amps		110	160								
Differential Pressure		3.5" WC	5.5" WC								
Observe Stack Emissions		Dust & Odor Free									
Large Wet Collector 324172											
Motor Amps		122	137								
Differential Pressure		2.0" WC	4.0" WC								
Observe Stack Emissions		Dust & Water Free									
Readings Completed By (PS# and Initials)											
Hours to Complete											**Hours for Week:**

Notes:

1. **Circle All Readings Not In Band With A Red Pen.**
2. **Explain All Readings Not In Band In The Remarks Section.**
3. **Boxes with bold outlines indicate Title V Equipment Operating Ranges**
4. **Abbreviations:** OK = Condition Met; WOW = Work Order Written (-) =not in use that day, or out of service

Remarks/Notes:

AIR POLLUTION CONTROL MALFUNCTION ABATEMENT PLAN

PURPOSE

To define how noncompliant environmental equipment is handled and corrective actions documented.

Any malfunction of equipment resulting in emissions exceeding permit specification limits by operational control requires a Malfunction Abatement Report form completed and a full investigation of the incident. (See work instruction, Malfunction Abatement Report for details). Record the out of range deviation. The date and time of deviation, cause of deviation, duration of deviation and corrective action taken must all be recorded.

If the visual opacity from the stack of the collector or if the operating parameters are out of range (amps, differential pressure), Maintenance will:

- Determine the extent of the damage and direct repairs and inspections of the malfunctioning unit and estimate the level of time and effort required to repair the unit.
- If the equipment cannot be repaired during normal operation, the affected process equipment will be shut down until the repairs can be made.

Specific corrective actions for malfunctions are based on Maintenance determination and are made as soon as practicable after their occurrence.

A piece of environmental equipment which is malfunctioning and resulting in emissions exceeding permit limits shall be shut down.

A bypass of the equipment may occur if:

A. The bypass is authorized by permit (this is not currently authorized for any equipment in use).

B. The bypass is necessary to: prevent or minimize damage to process control equipment, protect the safety of personnel, and minimize emissions or the time for repair or replacement of process equipment.

Malfunction records requirements:

Malfunction records are to be maintained per EMS Document and Data Control work instruction.

The date, time, probable cause, and location of the malfunction are documented.

The duration, sequence, and description of actions taken to correct the malfunction is recorded.

The identification of all sources which emitted in excess of emission limits as a result of the malfunction.

The type and quantity of emissions which exceed emissions limits for each source affected by the malfunction.

A description of actions taken to prevent the reoccurrence of the malfunction.

Notification of Michigan Department of Environment, Great Lakes & Energy (EGLE):EGLE

The EH&S Supervisor makes the determination of material classified as hazardous and non-hazardous.

Notification of EGLE is required when emissions in excess of emissions limits for hazardous air pollution continuing for more than one hour.

EGLE will be notified by the EMR as soon as reasonably possible, but not later than two business days, after the event. A completed written report will also be submitted to the EGLE within ten days after the event which includes information required by Act 451 R 336.1912

MOLD VENT IGNITION PLAN

Statement and Purpose:

Consistent with the requirements of 40 CFR, 63.7700(b) (6), this Mold Vent Ignition Plan has been prepared as an alternate approach to determination of mold ignitability.

Due to the jobbing nature of our operations at Grede LLC- Iron Mountain Foundry, the large quantity of part numbers run on any individual mold line, and the speed of our molding processes, it is not practical to evaluate, classify, and monitor mold vents on a routine basis. Therefore, we have elected to provide an auxiliary ignition source immediately after pouring on all mold lines at all times when the lines are in operation.

At the start of each operating shift, the Pouring Operator on each mold line performs their pre-startup checklist and forwards to the Mold Shift Supervisor. (See attached checklist). This is a visual inspection of the Light Off's to ensure they are lit and working properly.

POURING OPERATOR CHECKLIST

Date:____/____/____ Name:_____ Mach.:_____ Shift: 1 2 4

		Okay	Notified. Maint.
1.	Are all Mold Ignition Light Off's - ON and working properly? Must be checked at beginning of shift.		
2.	Check under the turntable or pouring and cooling line for iron build up.		
3.	Check the following on powered pouring devices:		
A.	Excessive play in ladle gearbox does it turn forward and back alright?		
B.	Remove any iron build up on the pivot points.		
C.	Check bail hooks for damage.		
D.	Check pendant for oil leaks.		
E.	Check wiring and pendant or PPD for damage.		
F.	Check your batteries for proper charging, do they hold a charge as long as they normally do?		
G.	Are safety cables in place on your PPD?		
4.	Is the turntable index foot pedal working correctly and the wiring and conduit in good condition?		
5.	Check to ensure all intake and exhaust fans for your area are turned on.		
6.	Check molds on Turntable to ensure they are centered on the base of each station.		

7. List any other problems you had related to equipment:

_____

_____

_____

_____

8.	Indicate the amount of time to complete all the above checks:	

When Completed Pourer Route to Supervisor, Supervisor Route to Operations Manager

GENERAL COMPLIANCE REQUIRMENTS

40 CFR Part 63 Subpart 63.7720

63.7720 (c)

Cupola Start-up
Charging
Cupola Tap Out/Open Tap Hole Procedure
Melting Down the Stack

CUPOLA START-UP

PURPOSE

To document the specific procedures to be used prior to tapout of the cupola, including preparation and burn in of the bed. (Refer to Flow Diagram).

SCOPE

This work instruction includes the process and all equipment associated with starting up the cupola both after production and after a period of no production.

DEFINITIONS

Coke - A by-product of coal, used as fuel and a source of carbon in the melting process.

Coke breeze - Dust and fine particles included with coke.

Coke bed - A thick layer of coke maintained in the bottom of the cupola, which must be replenished throughout the day.

Burning in the bed (bed burn-in, blowing in the bed) - the process of bringing the coke bed to the proper temperature and height for melting.

Tuyere - A water-cooled copper coil projecting through the wall of the cupola, through which air is blown into the cupola.

Tap Hole - The opening in the cupola through which molten iron exits.

Tap out - The process of opening the tap hole on a daily basis in order to allow the iron to flow out.

Charge - A predetermined mixture of metallic and non-metallic materials totaling a specific batch weight, which is used to produce molten iron.

Stack - The vertical shaft of the cupola, into which materials are charged.

Pollution Control System - Instruments associated with the cupola baghouse operation

RESPONSIBILITY

Melter A is responsible for coordinating cupola startup, and for documenting appropriate information on the Melt Log.

Melter B is responsible for assisting in duties as required.

GENERAL

All startups should include a coke bed which has been previously lit, either in hoppers prior to putting coke in the cupola, or by putting torches in the tuyeres once coke is already in the cupola.

A 33”-37” targeted bed height at the midpoint of the bed is necessary before the designated charge can be added (the clamp on the bed measuring cable should be level with the bottom of the charge door.)

PROCESS STEPS

If water has been turned off because of a reline or any other reason, be sure that the water and recycle system have been turned on correctly before proceeding.

Check the shell for even water flow all the way around. Ensure that it is clean by inserting the plastic scraper under the rubber bladder and running it all the way around.

Go behind the BBC and check the front and back water tanks. These circulate the water used to cool the cupola shell and must be full before lighting the coke bed. If not, the shell will burn up.

Proceed to the Tapper's Deck, and visually inspect the tuyeres for any tools or debris that may have been left from the reline or weekend work. TUYERES MUST BE CLEAR.

Measure the bed height by dropping the measuring cable down the cupola and observing where the clamp sits in relationship to the charge door. (NOTE: After a reline, there will be no remaining coke in the cupola.)

Add coke as necessary and remeasure the bed until the correct height is reached. (One inch of bed height equals approximately 200 pounds of coke) There cannot be any breeze added with bed coke as this could cause trouble tapping out.

Once all of the above is complete, the coke can be lit if it is not already.

Burning in the Bed

Assure all the coke is lit evenly before burn-in. Remove the torches and replace the tuyere covers. Replace the safety tuyere cover after assuring that it is open. NOTE: The safety tuyere must be open and clear, and monitored each operating day.

Start the baghouse blower and make sure it is in auto.

Start the afterburners and process air blower currently in use and set the CFMs at 5000. Start the hot blast tubes. When the computer or panel mate indicate that everything is running, start the blower and burn the bed in for 15 minutes at 5000 CFM and an additional 10 minutes at 5500 CFM. Shut off the blower and document required information on the melt log. By looking in the tuyeres, visually check the bed is properly lit.

During bed burn in, continue to monitor the water temperature (city water chain valve may need to be opened) and make sure it doesn't go above 140 degrees. Also monitor the crossover temperature, it must stay below 1900 or an alarm will sound, and the cupola will be shut off.

The tap hole should be visually monitored during burn-in to see if it is blowing. If so, flames, coke ash and sparks will come out, signifying that the tap hole is open.

After the burn in, use the reflective sleeve and re-measure the bed height. Add coke or extend burn in time if necessary, to bring bed to proper height. Document bed height on the Melt Log. Charging of the cupola should begin only after the proper height is reached (reference Work Instruction, 03-7.5-10 Charging.)

Send up 300 pounds of limestone, and then begin filling the stack with the designated charge.

Tapout is performed according to Work Instruction, Cupola Tap Out Open Tap Hole Procedure.

Monitor Pollution Control equipment and ensure that system is within determined operating ranges.

1. Back Pressure 1.0 Inch Min.
2. Motor Amps 115 to 281
3. Combustion Zone Temp 1300 Min.
4. Baghouse Inlet Temp 360 deg. to 495 deg.

If any of the above are out of range, notify the maintenance department.

CHARGING

PURPOSE

To detail the procedures to be followed in the charge area.

SCOPE

This work instruction covers guidelines for equipment usage, the actual process of charging, and completion of associated paperwork.

DEFINITIONS

Crane bay - Area in which the P & H Crane operates.

Charge pan - The holding device for the charge materials.

Skip hoist - The device used to send the charge materials to the cupola charge opening.

RESPONSIBILITIES

Crane Operator:

Removes IM returns from the end of the shaker.

Segregates IM returns in their respective piles.

Back-piles steel from incoming material as required.

Adds 2500# of metallic materials to each charge, maintaining individual material weight tolerances.

Sets P&H magnet either on pallet or keep it off ground so that it does not pick up moisture from the ground.

Performs and documents pre-use crane inspections.

Ground Man:

Inspects all loads of bulk materials according to Work Instruction, Receipt of Bulk Melt Materials.

Checks the charge and lump scales on a daily basis.

Documents the time each charge is sent up on the Charge Log, along with any additions or changes.

Monitors the eye in the charge pit that controls stoppage of the skip hoist. If it becomes dirty, it may cause a false indication that the skip is down.

Monitors that the feeder is emptying out well.

Monitors the coke stockpile and other raw materials, and hauls material as needed.

Keeps the concrete slab in the charge yard clean, sweeping it on an ongoing basis.

Inspects the air quality of the baghouse once per hour, records results on the Baghouse Audit Sheet, and acts on findings. Forward completed Baghouse Audit Sheet to the Manager of Environmental Engineering.

GENERAL

The Hitachi or Cat cranes are used as back up if the P&H crane has a breakdown.

PROCESS STEPS

At the beginning of the shift, the ground man:

Checks the lump and Charge scales according to Work Instruction, Melt Scale Checks.

Notes the charge makeup to be used for the day on the Charge Log and on the board located on the wall of the charge shack.

Charging Operation
Sequence of Charging Materials

Sequence of Addition	Material	Amount	Method of Weighing	Allowable Variance
1	Shredded Steel	As Req'd	Charge Scale	+/-50#
2	Returns	As Req'd	Charge Scale	+/-50#
3	Pig Iron and/or briquettes (if used)	As Req'd	Charge Scale	+/-20#
4	Coke FeMn Illmenite	As Req'd	Charge Scale	N/A N/A +/-1#

5	SiC	As Req'd	Known Weight	+/-5#
6	Limestone	As Req'd	Charge Scale	+/-5#
7	Lump FeSi	As Req'd	Lump Scale	+/-1#

Stack height is monitored by a video camera mounted on the charge floor, with the screen viewed in the charge shack. Before sending up a charge, check to see that the cupola can accept it.

If the charge in the stack can be seen fully, the stack is over-full. DO NOT SEND UP ANY CHARGES!

If the charge can barely be seen on the monitor, ONE ADDITIONAL CHARGE MAY BE ADDED. Adding more than one charge will result in material falling on the floor and the feeder jamming.

If no charges can be seen in the stack, it is under-full, and will accept more than one charge.

The Ground Man is responsible for assuring that the skip hoist is empty before transferring any charges. Charge sequence:

The Crane Operator adds all metallics in the order listed above.

The Ground Man adds accurate amounts of the rest of the required materials in any order once all metallics have been added.

Check to see that the skip hoist is down and empty and push the PAN TILT button to put the charge in to the skip hoist.

Press the PAN DOWN button to bring it down into position for charging.

If the feeder has not completed its cycle, or it is not in neutral, the skip hoist will not go up. A white light in the center of the charge panel indicates that the feeder is in neutral. Assure that it is and send up the charge by pushing the CHARGE UP button.

As the skip lowers, a limit is cleared, and the feeder automatically indexes to accept the charge. (The skip hoist automatically returns to the pan position in approximately 90 seconds)

The charge is loaded into the feeder, which enters the cupola automatically and runs for forty-five seconds or less.

Continue to charge and fill the stack until the last charge is visible on the monitor; then add one more charge.

Inspect Baghouse air quality once per hour, record on log what is found, and act on findings.

At the end of the shift:

Shut off power to panel.

Set P&H Magnet either on pallet or keep it off ground so it does not pick up moisture from the ground.

Once per shift, the Supervisor or designate completes an audit of charging practices. Results are noted on the Daily Melt Audit.

CUPOLA TAP OUT OPEN TAPHOLE PROCEDURE

PURPOSE

To define the practices to be used during tap out of the cupola (open tap hole).

SCOPE

This work instruction describes duties commencing after burn-in of the cupola bed has been performed.

DEFINITIONS

Cupola - A vertical melting device, into which materials are charged to produce molten iron.

Tap hole - The opening in the cupola through which the molten iron exits.

Tuyere - A water-cooled copper coil projecting through the wall of the cupola, through which air is blown into the cupola.

Dam - The area in front of the cupola which holds the iron before it flows under the skimmer to the holding furnace (BBC).

Campaign - The number of days which will be allowed to elapse before relining the cupola.

Hot spots - Areas on the cupola shell which lack water coverage.

Runner - Trough which conveys iron from the cupola to the BBC furnace. Slag notch - Opening in runner through which slag flows.

Drain hole - Opening beneath the well, used to drain the cupola.

RESPONSIBILITY

The Melter "A" is responsible for coordinating tapout of the cupola, and for documenting the required information on the Melt Log.

The Melter "B" is responsible for assisting in duties as required.

GENERAL

During tapout, a minimum of two persons must be available at all times - one person must watch the safety tuyere throughout the entire process.

PROCESS STEPS

Start the baghouse blower and make sure it is in auto. Confirm that the cupola cap is closed by looking at either the computer or pane/mate in the melt control room. If cap is not closed, contact Supervisor and do not proceed.

Start the afterburners.

Assure that the Totally Enclosed Treatment (TET) system is turned on. Record the treatment material weight at start-up on the T.E.T. Daily Audit Sheet.

Once the TET system computer reads out, start the process air blower. Set the CFM at 6000; then turn on the hot blast tubes.

After the hot blast lights come on showing that they are in operation, start the blast to the cupola. Write down the time on the Melt Log and watch the cupola closely.

Remove the torches from the dam and runner. Watch the shell for hot spots and check all of the tuyeres for iron and slag. Monitor how fast the iron is melting by visually looking in the tuyeres.

Place a piece of Cerawool in lower left side of dam to block skimmer opening.

The Melter assures that the tap hole is open. If the tap hole is not open, an oxygen lance rod will be used to open the tap hole. To lance the tap hole:

Obtain a minimum of two oxygen lance rods

Place one of the rods in the holder and secure it in place.

Bend the lance rod at a ninety-degree angle approximately two feet from the end opposite the rod holder.

Light the lance with a cutting torch.

Place the rod at the top of the tap hole. Keeping steady inward pressure, move the lance rod in a small circular motion, similar to "drilling".

When the rod is inserted in the cupola up to the ninety-degree bend, bend the remainder of the rod at a ninety-degree angle and continue the process. If the tap hole is not opened with the first lance, continue until it is open.

As the cupola warms up, iron will begin to melt, and iron will flow out of the tap hole into the dam. Monitor the skimmer at this time. When the iron level is high enough in dam to allow iron to go through the skimmer and down the runner, pull the Cerawool out from in front of the skimmer opening. If skimmer freezes , lance it open from the dam side to allow iron to flow through the skimmer and down the runner. Increase the CFM to 6500 when iron begins to flow.

During the following weeks of the campaign, less iron is available at tapout due to the increase in the diameter of the cupola well. Each day, modify the time span until the proper timing is reached. However, do not base tapout time on minutes ONLY, as that is not always accurate. Rather, watch the safety tuyere closely for slag build-up, and monitor the tuyere for melting rate.

MELTING DOWN THE STACK

PURPOSE

To standardize the practices to be used when melting down the stack (draining the cupola) at the end of the shift.

SCOPE

This work instruction covers the Iron Mountain Cupola.

DEFINITIONS

Slag - A by-product of melting iron, comprised of contaminants and impurities.

Charge - A predetermined mixture of metallic and non-metallic materials totaling a specific batch weight, which is used to produce molten iron.

Stack - The vertical shaft of the cupola, into which charges are placed.

Hot spots - Areas of the cupola shell over which no water is flowing.

RESPONSIBILITY

The Melter "A" is responsible for melting down the stack and completing all associated paperwork.

The Melter "B" assists in duties as needed.

GENERAL

The stack is melted down at the end of each week and may be melted down at any time during the week if circumstances require it.

Modify the last charges of the day by adding 100# of limestone boosters to assure that slag will flow easily during draining of the stack. Although it is preferable to modify the last nine charges, a minimum of three require modification.

PROCESS STEPS

Prepare to melt down the stack by "calling" the charge at the end of the operating shift (determine which type of charge - hard or soft - is needed to produce the correct chemistry at the beginning of the next operating day).

Modify the last charges of the day (minimum of three, nine preferable).

During the entire process, watch the shell for steaming or hotspots, and watch that the moat does not overflow. Melt the stack down with the wind at 6200 cfm or as close to this as possible to maintain good chemistry.

About 30 minutes into the drain, place the drain box under the drain hole and then go up on the tappers deck and begin to chip the drain hole out. Do not go all the way, just prep the hole so it will be easy to finish at the end.

About 40 minutes into the drain, shut the hot blasts off. During blowdown, if the baghouse temp reached 530 degrees, an alarm will sound, and the cupola will shut off. You may have to turn the wind down by 10% or adjust the stack sprays before continuing on.

When the iron stream dies down to about 1 inch in diameter, finish chipping the drain hole out. When iron runs out the drain hole, put a piece of Cerawool in the skimmer to plug it off. NOTE: with a full stack it takes about 55 - 60 minutes to empty the cupola.

When iron has begun to run out the drain hole, turn the cfm's down to 4500 - 5000 for the remainder of the blowdown. Blow the cupola out for 25-30 minutes or until all slag has stopped running. During the blowdown, run a rod through the tap hole a minimum of 3 times to ensure that it stays open. Continue to watch the shell for hotspots during this time.

When the blowdown is complete:

Turn the blast off

Activate the system cool down button on the main computer screen

NOTE: during the melt down, the crossover and upper stack temperatures must remain below 1850 degrees or an alarm will sound, and the cupola will shut off. If this happens, the wind may have to be left off for a minute or 2 and adjustments can be made to the stack sprays. The baghouse inlet temp must remain below 530 degrees.

Document the amount of iron in the IM furnace on the Melt Log.

63.7700(b) (4) Monitoring Plan Bag Leak Detection System-Exempt

(4) A site-specific monitoring plan for each bag leak detection system. For each bag leak detection system that operates on the triboelectric effect, the monitoring plan must be consistent with the recommendations contained in the U.S. Environmental Protection Agency guidance document "Fabric Filter Bag Leak Detection Guidance" (EPA-454/R-98-015). This baghouse monitoring plan is subject to approval by the Administrator. The owner or operator shall operate and maintain the bag leak detection system according to the site-specific monitoring plan at all times. The plan must address all of the items identified in paragraphs (b)(4)(i) through (v) of this section.

EPA-454/R-98-015 Reads:

1.0 APPLICABILITY Several types of instruments are available to monitor changes in particulate emission rates for the purpose of detecting fabric filter bag leaks or similar failures. The principles of operation of these instruments include electrical charge transfer and light scattering. This guidance applies to charge transfer monitors that use triboelectricity to detect changes in particle mass loading. Charge transfer monitors based on electrostatic induction are also potentially applicable, but sufficient information was not available to include them in this guidance. The set up procedures described in this guidance are intended to allow the operator to identify upset conditions within the baghouse (e.g., torn bags) using real time data. This guidance is not intended to evaluate changes in the long term performance of the baghouse system, nor does it apply to applications in which the monitoring system attempts to quantify emission rates. The guidance assumes an emission source with relatively constant exhaust gas flow rate and particulate matter (PM) characteristics. This guidance is not appropriate for applications in which these factors vary significantly. In addition, only fabric filters (both positive and negative pressure) with exhaust gas stacks are covered by this guidance.

The Cupola Baghouse does not have an upward stack. Rather it is vented on the north side of the baghouse.