MONROE PLANT ORDER	Subject: Cascade Room Dust Collectors Malfunction Abatement Plan	Page 1 of 7	Number: EV-16
Written:	Barry Marietta	Date:	Original Date:
Approved:		Date:	Revs:

VERIFY CURRENT VERSION IN DOCUMENTUM PRIOR TO USE – UNCONTROLLED WHEN PRINTED

1.0 Purpose

This plant order has been prepared to meet the requirements of Renewable Operating Permit number MI-ROP-B2816-2009 (and Permit-to-Install (PTI) # 93-09A) issued by the State of Michigan for a Malfunction Abatement Plan (MAP) for the Coal Handling Fabric Filter Dust Collection system at the Monroe Power Plant. This permit and Permit 93-09A require Monroe Power Plant to "...***not operate the facility unless the malfunction abatement plan (MAP) ... ...has been implemented and is maintained.***" This MAP has been prepared by Detroit Edison in accordance with Rule 911 of the Michigan Air Pollution Act (Part 55 of Michigan Act 451).

2.0 Scope

This plant order applies to the following equipment located in the Cascade Room where the coal (fuel) is transferred from the coal conveyor handling system into the coal silos that feed Monroe Power Plant's Unit 1, 2, 3 and 4 boilers. Crushed coal is loaded onto conveyor belts in the loading house. The conveyor system transports the crushed coal into the plant building through the 9th floor, north wall. The crushed coal is distributed by a series of belts into one of 28 coal silos. There are seven coal silos feeding into each unit boiler.

The Cascade Room is equipped with six fabric filter dust collectors to maintain a safe operating environment for workers inside the Cascade Room and to minimize fire explosion hazards from accumulated dust. The dust collectors remove dust that results from coal conveyor and coal transfer operations inside the Cascade Room. The Cascade Room Dust Collection System, with all six dust collectors operating, is capable of collecting air entrained with dust at a rate of 222,300 cubic feet per minute (cfm). The system accomplishes this by pulling dust-laden air from above each conveyor in the Cascade Room from of each silo. The Cascade Room Dust Collection System filters out the dust particles, allowing the clean air to exhaust to the atmosphere while depositing the collected dust

into the silos. The Cascade Room Dust Collection System consists of the following major components:

- Baghouse
- Exhaust Fan
- Air Lock Rotary Valve
- Make-up Air Fans
- Dust Disposal System
- Controls
- Indicating Lights
- Annunciators
- Fire Protection

Each Baghouse is a large square housing containing vertical bags mounted in parallel. The bags extend downward with their outlets mounted upward in a faceplate. Each bag is held in an expanded position by a steel frame. An exhaust fan pulls dust-laden air into the baghouse through pick-up hoods positioned above each conveyor belt and silo in the Cascade Room. Air is pulled through bags in the baghouse and dust particles are collected on the exterior (dirty) side of the bags. An outlet blower exhausts clean air that passes through the bags.

A jet-pulsed bag cleaning system utilizes pulsed air jets to knock accumulated dust off of the bags and into a hopper at the bottom of the conveyor. A rotary air-lock valve at the base of the hopper discharges accumulated dust to an air gravity conveyor. The air gravity conveyor transports dust to silos.

The Cascade Room dust collectors have the following emission limits:

Pollutant	SV-D1	SV-D2	SV-D3	SV-D4	SV-D5	SV-D6
Opacity	10%			5%		
PM (gr/dscf)	0.020			0.004		
PM10 (pph)	5.95	5.95	5.95	1.19	1.19	1.21
PM2.5 (pph)						

3.0 Definition

None

4.0 Responsibilities

4.1 The Plant Director is responsible for ensuring that Monroe Power Plant operates in compliance with all environmental and safely requirements and regulations.

4.2 The Environmental Engineer is responsible for monitoring environmental compliance related activities at Monroe Power Plant.

4.3 The Fuel Systems Manager is responsible for overseeing the operation, inspection, maintenance, and repair of all the coal handling system including coal conveyors and dust collection devices.

4.4 The Operations Shift Supervisor is responsible for all operations at the plant, and is management's representative during off-hours (i.e., nights and weekends) when plant management is not on site. The Shift Supervisor may be reached at 384-2235.

4.5 The Fuel Systems Shift Supervisor is responsible for all Fuel Systems operations, and is management's representative during off-hours (i.e., nights and weekends) when plant management is not on site. The Shift Supervisor may be reached at 384-2231.

4.6 The Fuel Systems Planning group is responsible for ensuring parts necessary for routine maintenance and common replacements for the system are stocked or are available on a quick turnaround basis from the vendor for more involved repairs or replacements for the systems. A complete list of system parts kept in stock is listed in the company's stock computer system. The parts list is filed by system and major component (e.g., Dust Collector 1, Rotary Valve) and contains a complete list of parts for that component including: stock number, noun/qualifier/ (e.g. gear reducer), manufacturer part number, and quantity on hand. A complete list of system parts that must be ordered from the vendor is kept on file in the Fuel Supply planners' office

5.0 Procedure

5.1 Daily Inspections

Air permits at the plant require daily non-certified visible emission observations on the Dumper House dust collector. These daily observations are performed by fuel supply personnel and logged in the plant's shift log system (PlantView). Should visible emissions be present, fuel

supply personnel will take appropriate corrective actions and document the situation and actions taken. Should the condition be such that it cannot be addressed to eliminate visible emissions, the dust collector will be shut down for repair. This determination will be made by fuel supply personnel. A certified visible emission reading will be performed by a certified observer whenever visible emissions present cannot be eliminated. This will be coordinated by the plant environmental group.

The Cascade Room dust collectors automatically monitor operating variables that may affect the performance of the system, and are equipped with equipment trip switches and/or alarms that will shut off the equipment in an orderly manner to avoid damaging the system, or alert operators of a possible malfunction. An alarm in the fuel supply control room and automatic shutdown of a dust collector is initiated whenever one of the following emergency situations occurs:

- Fire protection actuation
- Rotary vane feeder zero-speed
- Dust collector exhaust fan motor overload
- Hopper dust emergency high level
- Dust collector high differential pressure
- Pulse air low pressure

In addition to the visible emission readings, fuel supply personnel inspect all dust collectors once daily when railcar dumping occurs on the operational parameters outlined in Table 1 as follows. Table 2 indicates the alarm conditions associated with the Dumper House dust collector. As shown in Table 2, there is an alarm for pressure drop across the filter.

Table 1

Daily Inspection Checklist

Action	Checklist Requirement
Inspect/Monitor all operating Dust Collectors once daily	a. Check each operating baghouse differential indicator
	b. Check for visible emissions at air outlet from each filter

	c. Check control panel for alarms or other failed conditions
	d. Check fan and motor bearings for excessive heat or vibration
Inspect/Monitor all operating dust collector Control Panels once daily	Check for failed or alarm conditions (see Table 2 for Control Panel Alarm Conditions)
Record results in the Fuel Supply Control Room Electronic Log.	The inspecting operator will report inspection results to the Fuel Supply Control Room for inclusion in the Fuel Supply log.

Table 2

Control Panel (Annunciator) Alarm Conditions

• Explosion doors open
• Dust collector abnormal differential pressure
• Rotary vane feeder trip
• High hopper dust level
• Dust collector high temperature
• Dust collector exhaust fan trip
• Low pulse air pressure

Note: System motors are also equipped with overload protection devices that will shut the motors down in case of overload conditions that could damage the motor.

5.2 Maintenance Inspections and Tasks

The preventative maintenance items are inspected and performed by Monroe Fuel Systems as scheduled (see Table 3). Spare parts are kept on site. Although a full set of replacement parts is not available at all times, a supply of certain spare parts is kept on hand and other parts are available through established vendors.

Table 3

Maintenance Inspections and Tasks

Frequency of Inspection	Task
Bi-monthly	Perform the Vibration Analysis PdM Routine
Every Six Months	Lube/Inspection Routine
Annually	a. Check V-belt tension on all belts b. Inspect filter bags and replace if necessary c. Inspect rotary valves d. Inspect shivs and belts e. Check oil in motors and gear reducers f. Inspect fan and motor bearings for wear g. Inspect pulse air system

5.3 System Shutdown/Failure

Note: Emission limits are not expected to be exceeded during system shutdown, because there will be no emissions during shutdown. However, the dust collector system must be returned to service as soon as possible in order to maintain safe (i.e, low dust) working conditions inside the Cascade Room.

System Shutdown/Failure Tasks Performed by Monroe Fuel System Personnel:

1. If a malfunction or failure occurs that cannot be corrected by an operator, then a Work Order will be issued to repair the system.

2. To reduce dust within the Cascade Room and further prevent emissions to outside air, the following additional measures may be employed as necessary:

    a. Increased application of water spray to the dust collector hoods and Cascade Room walls, beams and floor.

    b. Application of a surfactant based foam spray to the Cascade Room walls, beams and floor.

    c. Increased use of wash boxes to clean conveyor belts.

    d. Increased use of dust control surfactant on the coal before entering the Cascade Room.

3. Notify regulatory agencies during excess emissions events as required in Detroit Edison Power Plant Order No. 223.

5.4 Record Retention

Maintenance records and records of emissions observations will be kept on file as required by the plant's Renewable Operating Permit and Permits-to-Install.

6.0 References

6.1 PPO 157 – Fuel Measuring and Sampling

6.2 PPO 223 – Air Quality Control

7.0 Revision History

Revision No.	Changes
1	Updated to include Permit 93-09A requirements.

MONROE PLANT ORDER	Subject: Dumper House Dust Collector Malfunction Abatement Plan	Page 1 of 7	Number: EV-17
Written:		Date:	Original Date:
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VERIFY CURRENT VERSION IN DOCUMENTUM PRIOR TO USE – UNCONTROLLED WHEN PRINTED

1.0 Purpose

This plant order has been prepared to meet the requirements of Renewable Operating Permit number MI-ROP-B2816-2009a and Permit-to-Install (PTI) # 93-09B issued by the State off Michigan for a Malfunction Abatement Plan (MAP) for the Coal Handling Fabric Filter Dust Collection system at the Monroe Power Plant. The permits require Monroe Power Plant to "...***not operate the facility unless the malfunction abatement plan (MAP) ... ...has been implemented and is maintained.***" This MAP has been prepared by Detroit Edison in accordance with Rule 911 of the Michigan Air Pollution Act (Part 55 of Michigan Act 451).

2.0 Scope

The Dumper House is a coal receiving and conveying facility for the coal (fuel) handling system at Monroe Power Plant. Coal that is unloaded at the Dumper House travels on feeder belts to dumper conveyor C2.

The Dumper House is equipped with a baghouse dust collector (DC-24) to maintain a safe operating environment for workers inside the Dumper House and to minimize fire or explosion hazards from accumulated dust. The dust collector exhausts to two (2) stacks on the west side of the Dumper House. The baghouse dust collector removes dust that results from coal dumping operations inside the Dumper House. The normal operation of DC-24 allows for a differential pressure across the dust collector of 0-10 inches of water (in.wg.). The dust collector has a trip built in which will stop operation at 8 in.wg. The Dumper House Dust Collection System is capable of collecting air entrained with dust at a rate of 150,000 cubic feet per minute (cfm). The system accomplishes this by pulling dust-laden air within the confines of the Dumper House. The Dumper House dust collector filters out the dust particles, allowing the clean air to exhaust to the atmosphere and the collected dust to be returned to the Dumper House conveyor belt. The Dumper House Dust Collection System consists of the following major components:

- Baghouse (Filter)
- Two Exhaust Fans & Stacks
- Belt Conveyor
- Filter Cleaning Blower
- Pneumatic Conveyor Blower
- Two Hoppers with Air Lock Rotary Valves
- Modicon PLC Controls
- Indicating Lights
- Instrumentation
- Annunciators
- Fire Protection System

The baghouse is a large cylindrical housing containing *vertical* bags mounted in parallel. The bags extend downward with their outlets mounted upward in a faceplate. Each bag is held in an expanded position by a steel frame. Dust-laden air is pulled by two exhaust fans into the baghouse through pick-up hoods positioned above each transfer point chute and at the end of the conveyors in the Dumper House. Air is pulled through bags in the baghouse and dust particles are collected on the exterior (dirty) side of the bags. Clean air that passes through the bags is exhausted by an outlet blower.

A jet-pulsed bag cleaning system utilizes pulsed air jets to knock accumulated dust off of the bags and into a hopper at the bottom of the dust collector. A rotary air-lock valve at the base of the hopper discharges accumulated dust to a pneumatic conveyor which discharges into a cyclone separator. Air from the separator is returned to the filter intake. The coal dust from the separator is discharged into a second hopper feeding a pin mixer which adds water to the coal dust. The pin mixer discharge is carried by a belt conveyor to the grizzly bar area above conveyor C2.

The Dumper House dust collector (DC-24) has the following emission limits:

Opacity – 5%
PM – 0.005 grains / dry standard cubic foot (gr/dscf)
PM_{10} & $PM_{2.5}$ – 6.44 pounds per hour (pph)

3.0 Definitions

None

4.0 Responsibilities

4.1 The Plant Director is responsible for ensuring that Monroe Power Plant operates in compliance with all environmental and safely requirements and regulations.

4.2 The Environmental Engineer is responsible for monitoring environmental compliance related activities at Monroe Power Plant.

4.3 The Fuel Systems Manager is responsible for overseeing the operation, inspection, maintenance, and repair of all the coal handling system including coal conveyors and dust collection devices.

4.4 The Operations Shift Supervisor is responsible for all operations at the plant, and is management's representative during off-hours (i.e., nights and weekends) when plant management is not on site. The Shift Supervisor may be reached at 384-2235.

4.5 The Fuel Systems Shift Supervisor is responsible for all Fuel Systems operations, and is management's representative during off-hours (i.e., nights and weekends) when plant management is not on site. The Shift Supervisor may be reached at 384-2231.

4.6 The Fuel Systems Planning group is responsible for ordering Replacement parts (e.g. replacement bags and frames, timer, solenoids, diaphragm assemblies, rotary valves). Parts may be ordered directly from the manufacturer by calling 1-763-717-0707. Most parts can be shipped within 24 hours of ordering. A complete list of parts and catalog numbers is included in the dust collector system operating manuals.

5.0 Procedure

5.1 Daily Inspections

Air permits at the plant require daily non-certified visible emission observations on the Dumper House dust collector. These daily observations are performed by fuel supply personnel and logged in the plant's shift log system (PlantView). Should visible emissions be present, fuel supply personnel will take appropriate corrective actions and document the situation and actions taken. Should the condition be such that it cannot be addressed to eliminate visible emissions, the dust collector will be shut down for repair. This determination will be made by fuel supply personnel. A certified visible emission reading will be performed by a certified observer whenever visible

emissions present cannot be eliminated. This will be coordinated by the plant environmental group.

In addition to the visible emission readings, fuel supply personnel inspect all dust collectors once daily when railcar dumping occurs on the operational parameters outlined in Table 1 as follows. Table 2 indicates the alarm conditions associated with the Dumper House dust collector. As shown in Table 2, there is an alarm for pressure drop across the filter. The unit alarms when this pressure reaches 8 in. wg. (inches water). When a pressure of 10 in. wg. is reached, the unit trips an additional alarm and the system shuts down immediately.

Table 1

Daily Inspection Checklist

Action	Checklist Requirement
Inspect/Monitor - all operating Dust Collectors once daily	a. Check each operating baghouse differential indicator
	b. Check for visible emissions at air outlet from each filter
	c. Check control panel for alarms or other failed conditions
	d. Check fan and motor bearings for excessive heat or vibration
Inspect/Monitor - all operating Control Panels once daily	Check for failed or alarm conditions (see Table 2 for Control Panel Alarm Conditions)
Record results in the Fuel Supply Control Room Electronic Log.	The inspecting operator will report inspection results to the Fuel Supply Control Room for inclusion in the Fuel Supply log.

Table 2

Control Panel Alarm Conditions

Control Panel Alarm	Condition Indicated
Filter Hopper HI Level	A HI level light will be indicated and the system alarm will sound if the collected dust should back up in the filter to the HI level control probe.
Filter Hopper HI-HI Level	The dust collector will shut down immediately, the HI-HI level light will be indicated, and the alarm will sound if the collected dust backs up in the filter to the HI-HI level probe.
Filter HI Differential and HI-HI Differential	This is a combination unit that measures the pressure differential across the filter. If the HI Differential (8 in. water) is reached, the HI differential light will come on and the system alarm will sound. If the HI-HI Differential (10 in. water) is reached, the HI-HI differential light will come on, the system alarm will sound, and the system will shut down immediately.
Belt Conveyor Zero Motion Speed Switch	An indicator light will come on, the alarm will sound, and the dust collector system will stop immediately if no motion of the screw conveyor is detected.
Rotary Valve Speed Switch	An indicator light will come on, the alarm will sound, and the dust collector system will stop immediately if no motion of the rotary valve is detected within.
Exhaust Fan Vibration Switch	If either fan vibration switch is activated, the correct indicator light will come on, the alarm will sound, and both fans will be shut down immediately.
Pressure Relief Vents Limit Switches	An indicator light will come on, the alarm will sound, and the dust collector system will shut down immediately if the pressure relief vent limit switches are open.
Filter Plenum Access Door Limit Switch	The "Relief Vent" indicator light will come on, the alarm will sound, and the dust collector system will shut down immediately if the access door opens.
Low Cleaning Pressure	The low cleaning pressure alarm will be activated if low air pressure is detected within 5 seconds of operation.
Fire System Controls	The dust collector system will shut down and the fire suppression system and fire alarm will be activated if a high temperature is detected in the system.

Note: System motors are also equipped with overload protection devices that will shut the motors down in case of overload conditions that could damage the motor.

5.2 Maintenance Inspections and Tasks

The preventative maintenance items are inspected and performed by Monroe Fuel Systems as scheduled (see Table 3). Spare parts are kept on site. Although a full set of replacement parts is not available at all times, a supply of certain spare parts is kept on hand and other parts are available through established vendors.

Table 3

Maintenance Inspections and Tasks

Frequency of Inspection/Action	Action Performed
Monthly	Fan Bearing Lube/Inspection Routine
	Valve Bearing Lube/Inspection Routine
Every Six Months	Lubricate: a. Fan Motor b. Blower Motor c. Belt conveyor bearing
	Perform Oil Changes on: a. Valve gear reducer b. Cleaning blower c. System gear reducer d. Pneumatic conveying blower

5.3 System Shutdown/Failure

Note: Emission limits are not expected to be exceeded during system shutdown, because there will be no emissions during shutdown. However, the dust collector system must be returned to service as soon as possible in order to maintain safe (i.e, low dust) working conditions inside the Dumper House.

System Shutdown/Failure Tasks Performed by Monroe Fuel System Personnel

1. If a malfunction or failure occurs that cannot be corrected by an operator, then a Work Order will be issued to repair the system.
2. To reduce dust within the Dumper House and further prevent emissions to outside air, the following additional measures may be employed as necessary:
    a. Increased application of surfactant dust suppressant along the conveyor in the Dumper House.
    b. Water misting of transfer points inside the Dumper House during coal transfer operations.
    c. Ceasing coal transfer operations during hot, dry and windy weather conditions when the potential for fugitive dust emissions is highest.
3. Notify regulatory agencies during excess emissions events as required in Detroit Edison Power Plant Order No. 223.

5.4 Record Retention

Maintenance records and records of emissions observations will be kept on file as required by the plant's Renewable Operating Permit and Permits-to-Install.

6.0 References

1. Detroit Edison Power Plant Order No. 223 - Air Quality Control
2. Rotary Dump Car System - Process System Description/Vendor Manual

7.0 Revision History

Revision No.	Changes
1	Updated to include the requirements of Permit 93-09.
2	Added doc control footer. Changed to reflect PTI 93-09B & note two stacks

1.0 Purpose

This plant order has been prepared to meet the requirements of Renewable Operating Permit number MI-ROP-B2816-2009 (and Permits-to-Install (PTI) # 93-09 & 93-09A) issued by the State of Michigan for a Malfunction Abatement Plan (MAP) for the Limestone & Gypsum handling systems at the Monroe Power Plant associated with emissions units EU-LIMESTONE-S1, EU-GYPSUMHAND-S1, and EU-HYDRATEDLIME-S1 as well as Permit 93-09. These permits requires Monroe Power Plant to ***"...not operate the facility unless the malfunction abatement plan (MAP) ... ...has been implemented and is maintained."*** This MAP has been prepared by Detroit Edison in accordance with Rule 911 of the Michigan Air Pollution Act (Part 55 of Michigan Act 451).

2.0 Scope

This MAP addresses the dust control equipment used in conjunction with the FGD limestone and synthetic gypsum material handling systems.

2.1 Limestone Handling

2.1.1 Description of System

Receiving and Storage

The limestone handling system accepts delivery of limestone from self-unloading Great Lakes bulk carrier vessels which discharge the limestone into a limestone receiving surge bin. Three volumetric belt feeders beneath the surge bin outlets feed material to the Limestone Receiving Conveyor which transports and discharges the limestone to a chute at the top of the Limestone Lowering Well. The lowering well discharges the limestone, forming the material into a conical storage pile. A surfactant based dust suppression system suppresses dust at the surge bin and receiving conveyor transfer points.

Air permits at the plant require daily non-certified visible emission observations (opacity limit – 10%) on exterior drop points and transfer points when the limestone system is operating. These daily observations are performed by FGD personnel and logged in the plant's shift log system (PlantView). Should visible emissions be present, appropriate corrective actions will be taken and the situation document appropriately. Should the condition be such that it cannot be addressed to eliminate visible emissions, the equipment will be shut down for repair. This determination will be made by FGD personnel. Also, in the event of visible emissions, a certified visible emission reading will be performed by a certified observer. This will be coordinated by the plant environmental group.

Reclaim and Transfer

Two hydraulically operated Rotary Plow Feeders reclaim limestone in a tunnel beneath the storage pile. One of the two rotary plow feeders acts as a standby. The plow feeder feeds limestone onto Limestone Reclaim Conveyor L-2. Conveyor L-2 transports the limestone and discharges into a transfer chute in Transfer Tower 1. A surfactant based dust suppression system suppresses dust at limestone reclaim and transfer conveyor transfer points through Transfer Tower 1.

The chute in Transfer Tower 1 discharges limestone onto Limestone Transfer Conveyor L-3. Conveyor L-3 transports and discharges the limestone into a transfer chute in Transfer Tower 2. The chute in Transfer Tower 2 discharges the limestone onto Limestone Transfer Conveyor L-4. Conveyor L-4 transports the limestone and discharges it into a bifurcated chute with a motor operated Diverter Gate. A fog based dust suppression system suppresses dust in Transfer Tower 2.

Diverter Gate LDG-1 discharges limestone either directly into the center Common Limestone Day Silo or onto Limestone Reversing Conveyor L-5. The reversing Conveyor L-5 discharges into the south silo which services Units 3 and 4 or the north silo which services Units 1 and 2. A fog based dust suppression system suppresses dust at Conveyor L-4, Diverter Gate LDG-1 and Conveyor L-5 transfer points.

Emergency Reclaim

Wheel loaders manually reclaim limestone from the storage pile and place it in trucks. The trucks transport and dump the limestone at a location near the Reagent Preparation Building. Wheel loaders reclaim the limestone from the dump location and deliver the limestone to the Emergency Reclaim Hopper.

2.1.2 Limestone Handling Dust Control Equipment

a. Wet and Fog Dust Suppression Systems

The Wet Dust Suppression System combines water with a concentrated wet surfactant to produce a high pressure, high volume spray capable of suppressing the high quantities of airborne dust associated with the unloading and reclaim operations. The wet surfactant reduces the surface tension of each water droplet sprayed, thereby allowing the dust particles to penetrate the droplet and fall back into the main material stream. An equipment enclosure, complete with all the required water and chemical control piping, houses all of the necessary equipment. All solution piping is routed from the equipment enclosure to spray manifolds for treatment of limestone during conveying operations.

The Fog Dust Suppression System combines water with compressed air to produce a heavy mist capable of suppressing the high quantities of airborne dust associated with transfer silo operations. The fog permeates the dust causing droplets that fall back into the main material stream. An equipment panel, complete with all the required water and compressed air control piping, contains all of the equipment necessary. All fog piping is routed from the equipment panel to spray manifolds for treatment of limestone during conveying operations.

Four (4) Dust Suppression Systems are provided to control fugitive dust at the conveyor transfer and loading points, they are listed as follows:

- Limestone Ship/Vessel Unloader Dust Suppression System

  The Unloader Dust Suppression System supplies wet dust suppression for both the Unload Hopper and the Feeders below. The Unload Hopper has four spray manifolds mounted in the best position to suppress dust. Each feeder has three manifolds. Two are located to spray the front and back sides of the limestone as it falls from the head of the feeder belt. The third is located at the impact point of the limestone on the conveyor.

- Limestone Rotary Plow Reclaim Dust Suppression System

  The Reclaim Dust Suppression System supplies wet dust suppression for both Rotary Plow Feeders. Each Rotary Plow Feeder has four spray manifolds. Two are mounted in the feeder walls. The other two are mounted at each of the conveyor transfer points.

- Limestone Transfer Tower #2 Fog Dust Suppression System

  The Transfer Tower Fog Dust Suppression System supplies fog dust suppression for the transfer tower conveyor. Four fog spray points are located at the head of the L-3 Conveyor and four more are located at the impact point of Conveyor L-4.

- Limestone Silo Area Fog Dust Suppression System

  The Silo Fog Dust Suppression System supplies fog dust suppression for the belts feeding to the silos. Four fog spray points are located at the head of Conveyor L-4. Four more are located at the impact points of each of the Unit #1/2 Reversing Belt and the Unit #3/4 Reversing Belt.

  Safe, effective and economical application of the dust suppressant is automatically controlled using a variety of signals. The signals are a mix of conveyor

running signals and a material-on belt sensor. Each signal either becomes an input to the plant's DCS or is pre-existing in the DCS network, which then controls outputs as necessary to correctly operate the system.

The Wet and Fog Systems are designed to run in "AUTO" mode at all times. The DCS system incorporates all the permissive/status signals as required, controlling the spray points properly.

b. Limestone Silo Bin Vents – The limestone bin vents are located at the top of the limestone storage silo. The bin vents are monitored on a daily basis for visible emissions. The bin vents protect against excess pressure in the limestone system. Air permits at the plant require daily non-certified visible emission observations on the bin vent filter (SV-26A). These daily observations are performed by FGD personnel and logged in the plant's shift log system (PlantView). Should visible emissions be present, appropriate corrective actions will be taken and the situation document appropriately. In the event that the condition cannot be addressed to eliminate visible emissions, the equipment will be shut down for repair. This determination will be made by FGD personnel. A certified visible emission reading will be performed by a certified observer when visible emissions are present and cannot be eliminated. This will be coordinated by the plant environmental group.

The bin vent filter has the following emissions limits:

Opacity – 5%
PM – 0.005 grains/dry standard cubic foot (gr/dscf)
PM_{10} & $PM_{2.5}$ – 6.44 pounds per hour (pph)

2.2 Gypsum Handling

The purpose of the gypsum handling system is to receive, transport, and store gypsum prior to loading into trucks for export. There is approximately 7-8%moisture content in the gypsum and therefore there are no suppression systems in place. However, measures are taken to prevent

track out and fugitive dust from the operation. The gypsum handling system consists of the following components:

- Three (3) diverter gate/bifurcated chute work assemblies (located in the Gypsum Dewatering Building)
- Two (2) gypsum collection conveyors (located in the Gypsum Dewatering Buildings)
- Two (2) gypsum transfer conveyors
- Two (2) diverter gate/bifurcated chute work assemblies at the off-specification gypsum storage enclosure
- Two (2) gypsum storage stack-out conveyors
- Two (2) telescoping chutes associated with the gypsum storage structure
- One (1) gypsum storage structure

Two (2) gypsum conveyor trains are used to transport the gypsum to the gypsum storage structure. Dewatered gypsum is discharged from the vacuum filters in the gypsum dewatering building through diverter gate/bifurcated chute work assemblies to either of two (2) gypsum collection conveyors. The operational collection conveyor discharges the gypsum to a dedicated gypsum transfer conveyor that conveys the gypsum to the gypsum storage area. A diverter gate/bifurcated chute arrangement allows the segregation and delivery of wallboard quality and off-specification gypsum into the gypsum storage structure. A wheel wash is used to wash truck tires as gypsum trucks leave the site, except during freezing conditions. The wheel wash & other water sprays in this area will not be utilized under freezing conditions as determined by fuel supply personnel. Other measures will be taken to ensure compliance with fugitive dust regulations. Generating dust is unlikely at the gypsum handling facilities, as most operations are enclosed, additional measures will be taken to control any dust that is generated that could reach ambient air.

3.0 Definitions

3.1 None

4.0 Responsibilities

4.1 The Plant Director is responsible for ensuring that Monroe Power Plant operates in compliance will all environmental and safety requirements and regulations.

4.2 The Environmental Engineer is responsible for monitoring environmental compliance related activities at Monroe Power Plant.

4.3 The Fuel Systems Manager is responsible for overseeing the operation, inspection, maintenance, and repair of all the limestone and gypsum handling systems including conveyors and dust suppression/collection devices.

4.4 The Operations Shift Supervisor is responsible for all operations at the plant, and is management's representative during off-hours (i.e. nights and weekends) when plant management is not on site. The Shift Supervisor may be reached at 384-2235.

4.5 The Fuel Systems Shift Supervisor is responsible for all Fuel Systems operations, and is management's representative during off-hours (i.e. nights and weekends) when plant management is not on site. The Shift Supervisor may be reached at 384-2231.

4.6 The Fuel Systems Planning group is responsible for ensuring parts necessary for routine maintenance and common replacements for the system are stocked or are available on a quick turnaround basis from the vendor for more involved repairs or replacements for the systems. A complete list of system parts kept in stock is listed in the company's stock computer system. The parts list is filed by system and major component (e.g. Dust Collector 1, Rotary Valve) and contains a complete list of parts for that component including: stock number, noun/qualifier/ (e.g. gear reducer), manufacturer part number, and quantity on hand. A complete list of system parts that must be ordered from the vendor is kept on file in the Fuel Supply planners' office.

Critical phone numbers are as follows:

Plant Director	(734) 384-2201
Fuel Supply Superintendent	(734) 384-2370
Operations Manager	(734) 384-2241
Maintenance Manager	(734) 384-2220
FS Shift Supervisor	(734) 384-2549

5.0 Procedure

5.1 Maintenance Inspections – preventative maintenance inspections and tasks are performed by Monroe Fuel Systems Operations as indicated in Tables 1-3. Spare parts are kept on site. Although a full set of replacement parts is not available at all times, a supply of

certain spare parts is kept on hand and other parts are available through established vendors.

Table 1

Limestone Storage Silo Dust Filter

Frequency of Inspection	Task
Weekly	Inspect timer and control setting
Every Three Months	Inspect condition of filter bags (install new bags is needed)
Every Six Months	a. Inspect blow pipes & orifices, housing welds and dampers b. Perform periodic calibration check
Annually	a. Inspect fan & fan pillow block for proper lubrication b. Inspect inlet & outlet ductwork, bin or hopper level indicators c. Inspect diaphragm and solenoid valves d. Inspect hopper and inlet baffles e. Inspect tube-sheet, tube-sheet welds & seals

Table 2

Limestone Receiving Surge Bin - Dust Suppression Water Supply Booster Pump

Frequency of Inspection	Task
Daily	a. Monitor and trend pump performance indicators, establish action levels and trend results b. Check lube oil level and add oil as necessary c. Perform visual inspection of pump seal d. Verify proper operation, observe condition and document abnormalities
Quarterly	Acquire lube oil sample and route sample for testing

Frequency of Inspection	Task
Annually	a. Lubricate greased coupling b. Perform component performance test of pump over full range of operation, establish baseline and action levels, and trend results
Every 21 Months	Inspect bearings and lubricate if necessary
Annually	Motor – Perform full spectrum lube oil analysis & establish action levels and trend results

Table 3

Limestone Receiving Surge Bin - Volumetric Belt Feeder FED's 4-6 Dust Suppression Spray Valves

Frequency of Inspection	Task
Annually	Inspect valve for damage, perform stroke test and verify nozzle spray pattern

5.2 System Shutdown/Failure

Note: Emission limits are not expected to be exceeded during system shutdown, because there will be no emissions during shutdown.

System Shutdown/Failure Tasks Performed by Monroe Fuel Systems Personnel

1. If a malfunction or failure occurs that cannot be corrected by an operator, then a Detroit Edison Work Order will be issued to repair the system.

2. Notify regulatory agencies during excess emissions events as required in Detroit Edison Power Plant Order No. 223.

3. Additional control measures (use of water portable water sprays, fogging systems, etc.) will be used to control dust in the event of an unexpected shutdown of the air pollution control equipment while handling limestone.

5.3 Record Retention

Maintenance records and records of emissions observations will be kept on file as required by the plant's Renewable Operating Permit and Permits-to-Install.

6.0 References

6.1 FSD # MONPP-FSD-0002
6.2 FSD # MONPP-FSD-0008

7.0 Revision History

Revision No.	Changes

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
JACKSON DISTRICT OFFICE

DAN WYANT
DIRECTOR

January 4, 2013

Ms. Kelly Johnson
Detroit Edison Monroe Power Plant
3500 East Front Street
Monroe, Michigan 48161

Dear Ms. Johnson:

This letter is in response to your November 9, 2013 submittal of the revised Catalyst Management Plan (CMP) portion of the malfunction abatement plans (MAP) that were required by Permit to Install #93-09B for Units 3 and 4 at the Monroe Power Plant. After reviewing the proposed CMP revision, staff determined the CMP adequate and is hereby approved. Please note that as the sampling and monitoring practices listed in the CMP produce information regarding catalyst longevity and performance, timelines and maintenance activities listed in the CMP should be updated as necessary and kept at the facility.

If at any time the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, Detroit Edison shall amend the MAP within 45 days after such an event occurs. Detroit Edison shall also amend the MAP within 45 days, if new equipment is installed or upon request from the District Supervisor. Detroit Edison shall submit the MAP and any amendments to the MAP to the AQD District Supervisor for review and approval. If the AQD does not notify Detroit Edison within 90 days of submittal, the MAP or amended MAP shall be considered approved. Until an amended plan is approved, Detroit Edison shall implement corrective procedures or operational changes to achieve compliance with all applicable emission limits.

If you have any questions concerning this matter, please feel free to contact me at 517-780-7481 or via email at millers@michigan.gov or Brian Carley at 517-780-7843 or via email at carleyb@michigan.gov.

Sincerely,

Scott Miller
Air Quality Division
Jackson District Supervisor
517-780-7481

Monroe Power Plant

Catalyst Management Plan

BACKGROUND

This catalyst management plan applies to catalyst installed in selective catalytic reduction (SCR) systems at Monroe Power Plant. SCR systems are installed on Units 1, 3, & 4 at the plant. The SCR system for Unit 2 is currently under construction and is planned to be operational in late 2014.

Each SCR system consists of a north and south side and is designed for four layers of catalyst. The original setup of the SCRs called for honeycomb style catalyst. Due to a number of issues with this catalyst, the decision was made to move to a plate style catalyst. Catalyst replacement work done to date with the plate style catalyst has eliminated the pluggage issues encountered with the honeycomb style catalyst.

CATALYST MANAGEMENT

The current Catalyst Management Plan establishes a schedule projection for adding and/or replacing catalyst layers in the SCR systems. Adding or replacing catalyst is considered a catalyst event. Catalyst events are planned for periodic or mid-cycle maintenance outages, of sufficient duration to perform catalyst replacement. Each unit is tentatively scheduled to have an extended maintenance outage approximately every 24-36 months. This schedule is dependent on many factors and changes occasionally. (*NOTE: DTE Energy will provide MDEQ with an update of the outage schedules semi-annually*.)

The Catalyst Management Plan calls for each SCR to have at least one layer of catalyst changed out every two years and adjusted based on catalyst performance. At this time, Units 1 & 4 have three installed layers of catalyst while Unit 3 has two layers installed. By the end of 2015, each unit with the exception of Unit 2 should have all four layers of catalyst installed and all installed catalyst layers will be plate type or similar pluggage-resistant catalyst. Unit 2 will begin service with three layers of catalyst. The fourth layer of catalyst is currently projected to be added in 2016. Once all SCRs are equipped with four layers of plate type catalyst, a layer of catalyst will be scheduled to be changed every other year. The layer to be changed will be dependent on several key variables including unit operation, the date the catalyst layer was installed, catalyst analysis and catalyst activity.

Many key factors impact catalyst performance. Catalyst performance analysis will consist of various methods including sampling data, inspections, testing data and tuning. Changes in the unit's maintenance outage schedule can have an effect on catalyst events. The Catalyst Management Plan will be adjusted as needed based on conditions and situation, which are evaluated on an ongoing basis.

CATALYST SAMPLING

In order for a sample of catalyst to be obtained, the SCR must be cooled and isolated to a point where it is safe for personnel to enter. An outage of at least 7 days duration is necessary for catalyst sampling. Therefore, samples of the SCR catalyst will be taken about once every 12-18 months during unit outages of ample duration and sent for analysis. At the time samples are taken, samples will be taken from all layers in the SCR with the exception of layers with less than one year in service and layers that are being removed at that time. This analysis is one tool that is used to judge catalyst performance. No more than 24 months will pass without a catalyst sample being taken from each SCR.

Results from the samples can take 90 days or more to receive. Samples are analyzed for a number of things including erosion, mechanical strength, ash deposition, chemical “poisoning” and catalyst activity. Results of these analyses are used to plot catalyst activity on an activity curve and compared to minimum activity requirements based on specifications provided by the catalyst manufacturer. The activity trend is only one indication of how well the catalyst is performing. This data will be used as one of the drivers for planning and adjusting future outages and catalyst events to ensure the catalyst activity is sufficient for proper NOx reduction.

CATALYST PLUGGAGE

The major issue with honeycomb catalyst encountered at the plant was catalyst pluggage. Catalyst pluggage will be mapped using information from inspections performed about every 12-18 months during unit outages of ample duration. Based on the amount of surface area lost in the catalyst due to pluggage, catalyst events may be shifted to minimize ammonia slip potential. For example, catalyst pluggage of over 50% may necessitate repair or replacement of that layer of catalyst within the next 12 to 18 months. Pluggage of over 80% would require repair or replacement of the catalyst layer. Screens in place upstream of the catalyst can also become plugged and are monitored on an ongoing basis and cleaned as needed.

AMMONIA SLIP

Ammonia slip is the term used for ammonia passing through the SCR without being used (reacting) for NOx reduction. Excess ammonia passing through the SCR unreacted causes interference with some stack emissions testing including HCl emissions testing. Excess ammonia passing through the SCR may be a signal of over-injection of ammonia, an instrumentation issue or another issue. Detection of excess ammonia slip will trigger an investigation into the root cause.

The plant is currently undergoing a project to install monitors to detect ammonia slip across the SCR. Monitors are installed and operational on Unit 3. Monitors on Unit 4 are installed and are in the testing phase with operation planned by the end of 2012. Monitors will be installed and operational on Unit 2 when the SCR comes online in 2014. Unit 1 monitors are currently planned for 2015.

The monitors used for detecting ammonia slip are process monitors only and are not certified monitors. In general, the monitors will be used to detect step changes in ammonia, but will not be used as a measurement tool for ammonia concentration. The installed ammonia monitoring system consists of 16 probes. The monitors are placed in the SCR outlet duct with eight probes for each side of the SCR (north & south). The monitors can be used as online detection tools to signal issues with the SCR system. The monitoring system is being analyzed for a possible means to alarm the plant operations group when data is outside of prespecified parameters.

Other processes are also monitored which may be a signal of ammonia slip. A variation in pressure change (ΔP) across the air heater and/or SCR may be an indication of an issue affecting SCR performance. Pressure drops of over 7" Hg require action to mitigate the problem such as cleaning pluggage from the impacted area. Ammonia levels in ash and waste water are monitored on an ongoing basis. Samples of ash and waste water are targeted to be taken on a monthly basis at minimum for analysis. An increase in these levels could be a sign that there is ammonia slip across the SCR.

AMMONIA INJECTION GRID

Ammonia injection grid (AIG) tuning or balancing is performed about every 12 months in an effort to minimize the amount of ammonia slip as catalyst condition and other conditions inside the SCR change over time. Tuning also ensures that ammonia is being injected uniformly across the inlet to the SCR in an effort to maximize NOx reduction efficiency to get uniform outlet NOx reduction from the SCR. Shifts in AIG tuning can be used as an online indicator of catalyst and/or AIG pluggage.

CATALYST ACTIVITY

Catalyst activity is a measure of catalyst performance. The catalyst potential is measured by the catalyst activity divided by the area velocity for that layer. Data for this is taken from sample analyses, monitors and testing. Expectation of catalyst activity is based on a curve provided by the manufacturer of the catalyst and is specific to that catalyst. Actual catalyst activity can be plotted against that baseline as a measure of how well installed catalyst is performing against initial expectations. The baseline activity is an estimate and is used as a guide. Information from sampling, testing and other analyses is used to determine

actual catalyst health. Baselines for new catalyst can be adjusted by learnings taken from previous layers of the same type. This measurement is used as one key variable in planning catalyst replacement. The curve can be updated as new data from sampling, inspections or other learnings is available. The image below is an example of a catalyst curve with hypothetical catalyst performance mapped against a baseline. Curves specific to Monroe Power Plant's equipment and operation are being developed as data is collected and analyzed from the current catalyst systems with the new plate style catalyst in operation. Curves provided by the manufacturer of the catalyst currently in place at the plant are used as guidelines for operation and catalyst replacement.

CORRECTIVE ACTION PROCEDURES

Most malfunctions of the control equipment will not result in emissions exceedances. However, the systems must be returned to service as soon as possible in order to maintain maximum emission control. If a malfunction or failure occurs that cannot be corrected by an operator, a Work Order will be issued to repair the system.

In the event of an emission exceedance not attributable to pollution control equipment failure(s) (e.g. boiler upset or turbine trip) operating personnel will follow Standing Operating Orders available in the Unit Control Rooms to reduce emissions to a non-exceedance level. The most commonly used appropriate measures are summarized below.

- Increase the boiler gas exit temperature. This corrective measure is most effective during start-up conditions.
- Reduce boiler load.
- Reduce boiler air flow by adjusting the forced draft fans.
- Adjust fuel blend. This measure may take several hours to impact the emissions and would only be implemented in event of a long-term malfunction.

Procedures for notification of regulatory agencies during a malfunction or excess emissions event are described in Power Plant Order (PPO) 223.

FREQUENCY OF MONITORING/MAINTENANCE

The following is a summary of the timeline of work and monitoring of the SCR catalyst:

Method	Planned Frequency & Description
Catalyst change out	One layer planned for replacement per unit every 24-36 months based on periodic maintenance outage schedule[1]
Catalyst sampling	Once every 12-18 months per unit based on maintenance outages of ample duration to perform task safely
Pluggage inspection	Once every 12-18 months per unit during maintenance outage of ample duration to perform task safely
Ammonia slip monitoring	Ongoing monitoring using ammonia monitors on units equipped with system
Ash & waste water sampling	Ongoing sampling and data collection
AIG tuning/balancing	Annually per unit & following outages in which catalyst is replaced or significant SCR work is performed
NOx monitoring	Continuously monitored using CEMS
HCl stack testing	Semi-annually through 3rd quarter 2013; evaluation after that time in conjunction with MDEQ

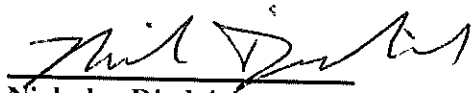
1 – Schedule is updated as needed; catalyst activity impacts replacement schedule

REVISION HISTORY

Revision No.	Changes
0	New plan; Information taken from Malfunction Abatement Plan to be used as a stand alone document (B. Marietta)

MALFUNCTION ABATEMENT PLAN

Monroe Fuels Company, LLC (MFC)
located at
Detroit Edison Monroe Power Plant

Revised By: 
Nicholas Diedrich
Environmental Engineer
DTE Energy Resources

Approved By: *James Sterling*
James Sterling
Plant Manager
Monroe Fuels Company

1.0 BACKGROUND

This Malfunction Abatement Plan has been prepared to meet the requirements of Special Condition III. 2 of EU-REFHS&BL-S1 of Permit to Install No. 27-13. This Malfunction Abatement Plan has been prepared by DTE Energy Services in accordance with Rule 911 of the Michigan Air Pollution Act (Part 55 of Michigan Act 451). Line 2 was physically removed in December, 2012. All references to Line No. 2 have been retained, even though the equipment no longer exists on-site.

2.0 DESCRIPTION OF SYSTEM

The Monroe Fuels Company (MFC) is a Refined Coal facility located at Monroe Power Plant. MFC produces Reduced Emission Fuel for use at Monroe Power Plant. The operation consists of mixing coal with S-Sorb and MerSorb additives to produce Reduced Emission Fuel that when combusted results in lower emissions than when burning untreated coal.

The process equipment consists of the following:

- New 60" Conveyors receiving coal from Existing Conveyors FE-11 and FE-12
- New Plant Feed Conveyor which is controlled by enclosures and Dust Collector No. 1. The New Plant Feed Conveyor feeds coal into Pug Mills Nos. 1 and 2. Coal is directed into the Pug Mills via a chute followed by two flop gates where emissions are controlled with partial enclosures
- 750 ton S-Sorb Silo controlled by Silo Bin Vent
- Coal, MerSorb, and S-Sorb mixing process consisting of two MerSorb Storage Tanks and two 30-ton S-Sorb Day Bins Nos. 1 and 2 each with a Bin Vent filter discharged into the building. S-Sorb is fed into to Pug Mills Nos. 1 and 2 via Rotary Vane Feeders followed by Screw Feeders
- Reduced Emission Fuel (or Refined Coal) from Pug Mills Nos. 1 and 2 is transferred on to the New REF Conveyor where emissions are controlled by Dust Collector No. 2
- From New REF Conveyor the Reduced Emission Fuel (REF) is then transferred to Existing Conveyors CV-19 and CV-20 where emissions are controlled by enclosures and Dust Collector No. 2. After transfer onto Existing Conveyors CV-19 and CV-20 the REF is then conveyed through Monroe Power Plant's coal handling system as it normally would.

Dust Collector No. 1 removes dust that results from the transfer of coal from Existing Conveyors FE-11 and FE-12 to the New Plant Feed Conveyor. Dust Collector No. 2 removes dust that results from the transfer of treated coal from the New Plant back to the Existing Plant, via conveyors CV-19 and CV-20. Both dust collectors accomplish this by pulling dust-laden air within the confines of the transfer points and filtering out the dust particles. The dust collector allows clean air to exhaust to the atmosphere and the collected dust to be returned to the conveyor belt. The dust collector consists of the following major components:

- Baghouse (Filter)
- Exhaust Fans
- Air Lock Rotary Valve
- Controls
- Indicating Lights
- Instrumentation
- Annunciators
- Fire Protection System

Each baghouse is a large housing containing 40 bags mounted in parallel. The bags extend horizontally with their outlets mounted vertically in a faceplate. Each bag is held in an expanded position by a steel frame. An exhaust fan pulls dust-laden air into the baghouse through pick-up hoods positioned above each transfer point. Air is pulled through bags in the baghouse and dust particles are collected on the exterior (dirty) side of the bags. An outlet blower exhausts clean air that passes through the bags.

A jet-pulsed bag cleaning system utilizes pulsed air jets to knock accumulated dust off of the bags and into a hopper that empties onto the conveyor through the rotary valve.

The S-Sorb Silo Vent, and Day Bin Vents Nos. 1 and 2 consist of the following major components:

- Baghouse (Filter)
- Controls

The Day Bin and S-Sorb Silo Vents' operation is the same as Dust Collectors No. 1 and 2 except that they utilize filter catridges instead of bags, and do not have an exhaust fan pulling air through the filter cartridges. Air moves through the filter cartridges as the S-Sorb is being pneumatically blown into the silo or day bin. The filter cartridges are cleaned with a jet pulse system and accumulated dust falls back into the silo or day bin.

The following table lists the Dust Collector Nos. 1 and 2, CMA (S-Sorb) Silo Vent, and Day Bin Vents Nos. 1 and 2 covered by this Malfunction Abatement Plan.

Description, Model	**PTI EU ID**	**PTI Stack/Vent ID**
Dust Collector No. 1, Donaldson Torit Dalmatic Dust Collector Model No. DLMC 1/4/15	EU-REFHS&BL-S1	SV-REFDC01
Dust Collector No. 2, Donaldson Torit Dalmatic Dust Collector Model No. DLMC 1/4/15	EU-REFHS&BL-S1	SV-REFDC02
CMA (S-Sorb) Day Bin Vent No.1, MAC Process Model 39 AVSC25 Filter	EU-REFHS&BL-S1	NA – day bins vent inside the building
CMA(S-Sorb) Day Bin Vent No. 2, MAC Process Model 39 AVSC25	EU-REFHS&BL-S1	NA – day bins vent inside the building

Filter		
S-Sorb Silo Vent, MAC Process Model 39 AVSC25 Filter	EU-REFHS&BL-S1	SV-REFBV

3.0 PREVENTIVE MAINTENANCE PROGRAM

3.1 Responsible Personnel

The MFC Plant Manager is responsible for ensuring that Monroe Fuels Company operates in compliance with all environmental regulations. The MFC Plant Manager is responsible for day to day operations and maintenance of Dust Collectors No. 1 and 2, CMA (S-Sorb) Silo Vent, and Day Bin Vents Nos. 1 and 2.

Critical phone numbers are as follows:

MFC Plant Manager: James Sterling (810) 335-5165

3.2 Inspections/Maintenance

MFC personnel visually inspect Dust Collector Nos. 1 and 2, CMA (S-Sorb) Silo Vent, and Day Bin Vents Nos. 1 and 2 once daily when the plant is running. Maintenance on the equipment is performed on an as needed basis. Dust collector bags can be changed while the plant is running. Differential pressure (DP) data from the baghouses is monitored via the plant's Programmable Logic Controlled (PLC) computer system. Changes in DP may indicate baghouse maintenance or repairs are needed.

3.3 Replacement Parts

Replacement parts (e.g. replacement bags and frames, timer, solenoids, diaphragm assemblies, rotary valves) may be ordered directly from the manufacturer. One set of dust collector filter bags will be kept on hand at the facility. Most parts can be shipped within 24 hours of ordering. A complete list of parts and catalog numbers is included in the equipment operating manuals.

4.0 MONITORING REQUIREMENTS

The dust collector automatically monitors differential pressure that may affect the performance of the system, and are equipped with equipment trip switches and/or alarms that will shut off the equipment or alert operators of a possible malfunction. Daily inspections of the system include an inspection of the control panel to check for failed or alarm conditions. All alarms are shown in the plant's PLC computer system.

The dust collectors operate normally with the cleaning cycle installed at 4 inch DP or less reading the photohelic. Automatic cleaning begins at DP of 4 inches. DP of 5 inches will trigger

an alarm of the PLC computer system. DP reading of 6 or more will require manual operator intervention to activate a cleaning cycle. The operator will shut the unit down at 6 inches.

Truck drivers delivering S-Sorb must call the plant office or Control Room to determine if a load of S-Sorb can be delivered to the RC plant. The controls for the 750 ton silo are equipped with an alarm designed to alert the control room operator when the silo is being filled so that the silo can be monitored during filling.

5.0 CORRECTIVE ACTION PROCEDURES

If a malfunction or failure that may cause emissions in excess of a permit limit occurs and it cannot be corrected by an operator, then the affected portion of the facility shuts down until the malfunctioning equipment can be repaired or replaced.

6.0 REFERENCES

- Monroe Refined Coal Facility, Pug Mill Facility, Maintenance and Operations Manuals, Donaldson Torit Dalamatic Dust Collectors
- Monroe Refined Coal Facility, Pug Mill Facility, Maintenance and Operations Manuals, Single 750 Ton Storage Silo, 30 Ton Dispensing Silo (S-Sorb) & Bin Vent Filter Equipment Manuals S-Sorb System

7.0 Revision History

Date	Description
6/4/2014	Replaced the term "bag" with "filter cartridge" throughout document.
6/4/2014	Deleted slide gate from equipment list in section 2.0.
6/4/2014	Revised section 2.0 to reflect correct orientation of filter cartridges.
6/4/2014	Removed reference to safety regulations in section 3.1.
6/4/2014	Added sentence stating that dust collector filter cartridges can be changed while the plant is running in section 3.2
6/4/2014	Revised 4.0 to reflect that dust collector specifically monitors differential pressure. Revised to state that normal cleaning cycle begins at 3 inches of DP instead of 1 inch; automatic cleaning cycle begins at 4 inches; that a DP reading of 6 inches triggered manual operator intervention and shut down. Revised truck delivery description to reflect that drivers must call the plant office before coming on site rather than signage at the silo directing them to call the control room and to reflect that the silo fill connection is not locked.

6/4/2014	Changed reference to FG as REF operations are now in a single EU in the updated permit 27-13. New EU is EU-REFHS&BL-S1

1.0 PURPOSE

This Malfunction Abatement Plan (MAP) has been prepared to meet the requirements of the Permit to Install (PTI) No. 27-13 issued by the State of Michigan for petroleum coke (PetCoke) material handling at the Monroe Power Plant. This permit requires Monroe Power Plant to implement and maintain all process and emission control equipment as specified in a MAP approved by the MDEQ – Air Quality Division. This Malfunction Abatement Plan has been prepared by DTE Electric Company accordance with Rule 911 of the Michigan Air Pollution Act (Part 55 of Michigan Act 451).

2.0 SCOPE

The PetCoke handling facility consists of a material storage pile, temporary conveyors, a feeder and a permanent chute. The material is moved from the storage pile into the feeder using front end loaders. The feeder loads the material onto a conveyor equipped with a scale for material usage tracking. The conveyors then transfer the material to the chute where it is added to the coal stream on CV-C4. Feeder and conveyors are operated locally by fuel systems operators. Emissions on the temporary conveyance system are controlled by partial enclosures and water sprays.

The PetCoke handling facility has the following emissions limits:

Opacity – 10% at drop and transfer points

3.0 DEFINITIONS

None

4.0 RESPONSIBILITIES

4.1 The Plant Director is responsible for ensuring that Monroe Power Plant operates in compliance with all environmental and safety requirements and regulations.

4.2 The Environmental Engineer is responsible for monitoring environmental compliance related activities at Monroe Power Plant.

4.3 The Fuel Systems Manager is responsible for overseeing the operation, inspection, maintenance, and repair of all the coal handling system.

4.4 The Fuel Systems Shift Supervisor is responsible for all Fuel Systems operations, and is management's representative during off-hours (i.e. nights and weekends) when the plant management is not on site.

4.5 The Fuel Systems Planning group is responsible for ordering replacement parts and managing the leasing of the temporary equipment.

Critical phone numbers are as follows:

Fuel Supply Manager	(734) 384-2370
Fuel Supply Shift Supervisor	(734) 384-2231
Environmental Engineer(s)	(734) 384-2560, (734) 384-2559

5.0 PROCEDURES AND CORRECTIVE ACTIONS

5.1 Inspections and Maintenance

5.1.1 The PetCoke handling system will be monitored daily by non-certified visible emission observations. Records of emissions will be maintained in the Daily Shift Log in PlantView. Per the site's Fugitive Dust Control Plan (MONPP EV-20), water will be applied when necessary via water cannons. If a water cannon failure occurs, a portable water cannon will be brought into service in its place and necessary repairs will be made.

5.1.2 Wheel wash circulating pump operation will be monitored daily by the FGD control room. If water levels are low, an alarm is triggered and a journeyman is dispatched to inspect and either add more water or perform necessary maintenance on circulating pump. The wheel wash is operated from April 1 – November 1 to avoid freezing temperatures.

5.1.3 The temporary PetCoke conveyance system is operated locally and an operator is present during the entire fueling operation. When the system is operational, conveyors and transfer chute will be inspected prior to and during each PetCoke fueling operation to detect any operational upsets or damage to the partial enclosures that can cause excess emissions. PetCoke Operator will inspect the partial enclosures on the conveyor transfer points, transfer chute enclosure, conveyor belt and belt path for spill over. Any significant spill over will be collected and returned to the pile or feed hopper. Every six months, all moving parts of the temporary system will be greased by the vendor of the equipment.

5.1.4 If the temporary PetCoke conveying system is taken out of service, the plant may use the reclaim hopper and conveyor to provide PetCoke to the units. If a failure occurs and the reclaim hopper and conveyor can no longer feed the coal into the plant, any PetCoke accumulated on the grizzly bars will be removed and returned to the PetCoke storage pile until necessary repairs can me made.

5.2 Replacement Parts

Monroe Power Plant stocks parts necessary for routine maintenance and common replacements for these systems. Any repairs or replacement of parts for the temporary conveyor system or feeder will be provided by the vendor leasing the equipment to the site.

5.3 System Shutdown/Failure

Most malfunctions of the control equipment will not result in emissions exceedances. However, the systems must be repaired and returned to service as soon as possible in order to maintain maximum emission control.

5.3.1 System Shutdown/failure Tasks Performed by Monroe Fuel System Personnel

1. If a malfunction or failure occurs that cannot be corrected by the PetCoke operator, then a Work Order will be issued to repair the system.

2. To prevent emissions during repair, the following additional actions can be taken:

   a. Use of portable, temporary water supplies and/or dust suppressant applications

   b. Installation of canvas or other wind deterrents while partial enclosures are repaired

3. Notify regulatory agencies during excess emissions events as required in Power Plant Order (PPO) 223 – Air Quality Control.

5.4 Record Retention

All records of maintenance, operation, and emissions observations will be kept on file as required by the plant's Air Permits.

6.0 REFERENCES

Procedures for notification of regulatory agencies during a malfunction or excess emissions event are described in Power Plant Order (PPO) 223 – Air Quality Control and Environmental Program 06 – Air Quality Management.

Noted by: Approved by:

7.0 REVISION HISTORY

Revision No.	Changes
0	New EV-

MONROE PLANT ORDER	Subject: Transfer House Dust Collectors Malfunction Abatement Plan	Page 1 of 7	Number: EV-18
Written:		Date:	Original Date:
Approved:		Date:	Revs: 0

VERIFY CURRENT VERSION IN DOCUMENTUM PRIOR TO USE – UNCONTROLLED WHEN PRINTED

1.0 Purpose

This plant order has been prepared to meet the requirements of Renewable Operating Permit number MI-ROP-B2816-2009a and Permit-to-Install (PTI) # 93-09B issued by the State off Michigan for a Malfunction Abatement Plan (MAP) for the Coal Handling Fabric Filter Dust Collection system at the Monroe Power Plant associated with EU-TRANSFERHS-S1 as well as Permit 93-09. These permits require Monroe Power Plant to "***...not operate the facility unless the malfunction abatement plan (MAP) ... ...has been implemented and is maintained.***" This MAP has been prepared by Detroit Edison in accordance with Rule 911 of the Michigan Air Pollution Act (Part 55 of Michigan Act 451).

2.0 Scope

The function of the dust collection systems in the transfer houses is to minimize and control dust emissions generated by the coal handling system. In general, dust collection systems have been provided for all dust generating areas such as conveyor chutes, enclosed transfer points, surge bins, etc., with the prime objective to control and contain the generated dust within each transfer house.

Six transfer houses (TH-4 is referred to in PTI as EU-CRUSHERHS-S1) are equipped with eleven fabric filter dust collectors to maintain a safe operating environment for workers inside the transfer houses and to minimize fire explosion hazards from accumulated dust. The dust collectors remove dust that results from coal conveyor and coal transfer operations inside the transfer houses. The system accomplishes this by pulling dust-laden air from each transfer point and from surge bins. The dust collectors filter out the dust particles allowing the clean air to exhaust to atmosphere and the dust to be returned to the operating conveyor belt. The Transfer House Dust Collection Systems consist of the following major components:

- Baghouse
- Exhaust Fan
- Air Lock Rotary Valve
- Reversing Screw Conveyors
- Controls
- Indicating Lights
- Annunciators
- Fire Protection
- Instrumentation

Each Baghouse is a large cylindrical housing containing vertical bags mounted in parallel. The bags extend downward with their outlets mounted upward in a faceplate. Each bag is held in an expanded position by a steel frame. An exhaust fan pulls dust-laden air into the baghouse through pick-up hoods positioned above each conveyor belt and surge bin. Air is pulled through bags in the baghouse and dust particles are collected on the exterior (dirty) side of the bags. An outlet blower exhausts clean air that passes through the bags. A jet-pulsed bag cleaning system utilizes pulsed air jets to knock accumulated dust off of the bags and into a hopper at the bottom of the conveyor. A rotary air-lock valve at the base of the hopper discharges accumulated dust to screw conveyors. The screw conveyors transport the dust to the operating conveyor belt. Potential emissions from coal unloading at the ship are controlled using water sprays when necessary. Ships are self-unloading and transport coal using a covered boom conveyor to a partially enclosed bin (BN01). Fuel supply operators are available when unloading starts and as necessary during the unloading process. It should be noted that most coal unloading emissions will be controlled at the transfer houses as outlined in the remainder of this document.

The plant's ROP as well as PTIs include limits on dust collector emissions (opacity, PM, PM_{10} & $PM_{2.5}$). Each of the dust collectors associated with the Transfer House system are outlined in Table 1. The opacity limit for each dust collector is 5%. The table also includes a summary of the PM, PM_{10} & $PM_{2.5}$ emission limits for each dust collector included in the permits. The PM limits listed are in units of grains per dry standard cubic foot (gr/dscf) and the other limits in the table are in units of pounds per hour (pph)

Table 1

Dust Collector Emission Limits

Transfer House	Dust Collector(s)	PM Limit	PM_{10} Limit	$PM_{2.5}$ Limit
TH-1	DC01, DC22, DC02, DC23	0.010	1.93	1.93
TH-2	DC-15	0.010	1.54	1.54
	DC-21	0.010	1.29	1.29
TH-3	DC-04 (de-commissioned – fogger system used in area)	0.004	0.89	0.89
TH-4	DC-05	0.004	0.99	0.99
TH-9	DC-16	Not in permit		
	DC-17 (de-commissioned – dust suppressant used in area)	0.020	2.40	2.40
TH-11	DC-19	0.020	2.74	2.74

3.0 Definitions

3.1 None

4.0 Responsibilities

4.1 The Plant Director is responsible for ensuring that Monroe Power Plant operates in compliance with all environmental and safely requirements and regulations.

4.2 The Environmental Engineer is responsible for monitoring environmental compliance related activities at Monroe Power Plant.

4.3 The Fuel Systems Manager is responsible for overseeing the operation, inspection, maintenance, and repair of all the coal handling system including coal conveyors and dust collection devices.

4.4 The Operations Shift Supervisor is responsible for all operations at the plant, and is management's representative during off-hours (i.e., nights and weekends) when plant management is not on site. The Shift Supervisor may be reached at 384-2235.

4.5 The Fuel Systems Shift Supervisor is responsible for all Fuel Systems operations, and is management's representative during

off-hours (i.e., nights and weekends) when plant management is not on site. The Shift Supervisor may be reached at 384-2231.

4.6 The Fuel Systems Planning group is responsible for ensuring parts necessary for routine maintenance and common replacements for the system are stocked or are available on a quick turnaround basis from the vendor for more involved repairs or replacements for the systems. A complete list of system parts kept in stock is listed in the company's stock computer system. The parts list is filed by system and major component (e.g., Dust Collector 1, Rotary Valve) and contains a complete list of parts for that component including: stock number, noun/qualifier/ (e.g. gear reducer), manufacturer part number, and quantity on hand. A complete list of system parts that must be ordered from the vendor is kept on file in the Fuel Supply planners' office.

5.0 Procedure

5.1 Daily Inspections

Air permits at the plant require daily non-certified visible emission observations on the Dumper House dust collector. These daily observations are performed by fuel supply personnel and logged in the plant's shift log system (PlantView). Should visible emissions be present, fuel supply personnel will take appropriate corrective actions and document the situation and actions taken. Should the condition be such that it cannot be addressed to eliminate visible emissions, the dust collector will be shut down for repair. This determination will be made by fuel supply personnel. A certified visible emission reading will be performed by a certified observer whenever visible emissions present cannot be eliminated. This will be coordinated by the plant environmental group.

The Transfer House dust collectors automatically monitor operating variables that may affect the performance of the system, and are equipped with equipment trip switches and/or alarms that will shut off the equipment in an orderly manner to avoid damaging the system and/or creating excess emissions, or alert operators of a possible malfunction. The dust collectors are designed to operate at a differential pressure of 0-10 inches of water (in.wg.) across the filter bag. An alarm in the fuel supply control room and automatic shutdown of a dust collector is initiated whenever one of the following emergency situations occurs:

- Fire protection actuation
- Rotary vane feeder zero-speed
- Dust collector exhaust fan motor overload
- Hopper dust emergency high level
- Dust Collector high differential pressure (> 6 in wg)
- Pulse air low pressure.

Table 2

Daily Inspection Checklist

Action	Checklist Requirement
Inspect/Monitor all operating Dust Collectors once daily	a. Check for visible emissions at air outlet from each filter
	b. Check control panel for alarms or other failed conditions
Inspect Coal Unloading (ship)	Note excess emissions and corrective actions taken.
Inspect/Monitor all operating Control Panels once daily	Check for failed or alarm conditions (see Table 2 for Control Panel Alarm Conditions)
Record Results in the Fuel Supply Control Room Electronic Log	The inspecting operator will report inspection results to the Fuel Supply Control Room for inclusion in the Fuel Supply log.

Table 3

Control Panel (Annunciator) Alarm Conditions

Explosion doors open
Dust collector high differential pressure (> 6 in wg)
Rotary vane feeder trip
High hopper dust level
Dust collector high temperature
Dust collector exhaust fan trip
Low pulse air pressure

Note: System motors are also equipped with overload protection devices that will shut the motors down in case of overload conditions that could damage the motor.

5.2 Maintenance Inspections and Tasks

The preventative maintenance inspections and tasks are performed by Monroe Fuel Systems Operations as indicated in Table 4. Spare parts are kept on site. Although a full set of replacement parts is not available at all times, a supply of certain spare parts is kept on hand and other parts are available through established vendors.

Table 4

Maintenance Inspections and Tasks

Frequency of Inspection	Task
Bi-monthly	Perform the Vibration Analysis PdM Routine
Semi-annually	Lube/Inspection Routine
Annually	a. Check V-belt tension on all belts b. Inspect filter bags and replace if necessary c. Inspect rotary valves d. Inspect shivs and belts e. Check oil in motors and gear reducers f. Inspect fan and motor bearings for wear g. Inspect pulse air system

5.3 System Shutdown/Failure

Note: Emission limits are not expected to be exceeded during system shutdown, because there will be no emissions during shutdown. However, the dust collector system must be returned to service as soon as possible in order to maintain safe (i.e, low dust) working conditions inside the Transfer House. In addition, systems must be safely and orderly shutdown in order to ensure safety of personnel and reduce environmental impacts.

System Shutdown/Failure Tasks Performed by Monroe Fuel System Personnel

1. If a malfunction or failure occurs that cannot be corrected by an operator, then a Work Order will be issued to repair the system.

2. To reduce dust within the Transfer Houses and further prevent emissions to outside air, the following additional measures may be employed as necessary:
   a. Increased application of water spray to the dust collector hoods and Transfer House wall, beams and floor.
   b. Application of a surfactant based foam spray to the Transfer House wall, beams and floor.
   c. Increased use of wash boxes to clean conveyor belts.
   d. Increased use of water spray at transfer points.

3. Notify regulatory agencies during excess emissions events as required in Detroit Edison Power Plant Order No. 233.

5.4 Record Retention

Maintenance records and records of emissions observations will be kept on file as required by the plant's Renewable Operating Permit and Permits-to-Install.

6.0 References

6.1 Detroit Edison Power Plant Order No. 223 – Air Quality Control

7.0 Revision History

Revision No.	Changes
0	New Plan
1	Formatting, PTI # change (A to B), doc control footer