

MALFUNCTION ABATEMENT PLAN FOR STARTUP, SHUTDOWN AND MALFUNCTIONS OF THE RODAIR CYCLOFILTER, MODEL NO. CF-12

The following operation, maintenance, and recordkeeping procedures must be implemented at BIEWER LUMBER PLANT located in McBain, MI to ensure that all process, control, and monitoring devices are functioning within permit and manufacturers specifications.

The procedures shall be revised as necessary to improve operation of the devices.

1. PROCESS DESCRIPTION

The Sawmill and Planer mill process, at BIEWER LUMBER PLANT located in McBain, MI, consists of one (1) planer, one (1) hog and one (1) trimmer all related to the wood transformation process.

The dust collector is an 80,718 CFM Rodair, CYCLOFILTER Model no. CF-12 which uses a compressed air pulse cleaning system for the cleaning of the filter bags. The baghouse is equipped with a Monitor, bag leak detector system to monitor and detect bag leaks.

The baghouse system is monitored by several devices, including visual observation. Differential pressure is monitored in the unit by a pressure module (Photohelic gauge) mounted on the electronic timer board. This pressure module initiates the cleaning sequence when the set values are reached. There are two (2) small ¼" diameter tubes (hoses) connected one (1) on the clean side of the dust collector and one (1) on the dirty side of the dust collector.

A heat detector is mounted inside of the upper section of the dust collector (clean side of the dust collector). This unit is used to provide a signal to stop the system in the event of a high temperature is detected. This heat detector indicates to ensure that the gas temperature does not rise above an operating range that could potentially damage the filtration bags.

A Triboelectric device is mounted on the outflow side of the filtration system. This device is designed to monitor for any particulate matter that passes through the filtration bags. This device is used in identifying potential problems between the intake and outflow sides on the filtration system such as the presence of broken, torn, or dislodged filtration bags. This device is used in conjunction with routine observation of the stack by the dust collector operator. Visual observations are also used on a routine basis to identify any issue that could occur in the baghouse filtration system.

2. CORRECTIVE PROCEDURES AND RESPONSIBLE PERSONS

This start-up, shutdown, malfunction plan shall be followed to meet the compliance limits. If the limits are exceeded it is the responsibility of the plant supervisor, or in his absence the plant operator, to stop the plant and correct the problem immediately.

3. STARTUP/SHUTDOWN PROCEDURES

The specific start-up and shutdown procedure shall be used. Improper start-up or shutdown can damage the equipment and therefore proper procedure must be followed each time. The mill equipment (planer, hog and trimmer) cannot start without the operation of the dust collection system. The baghouse must start prior to start all planer mill equipment related to this system.

The dust collector start-up / shutdown procedure is programmed by the mill PLC in order to provide a proper START and STOP sequence of the equipment including confirmation of all interlocks. The NO-GO conditions include:

- High temperature into the dust collector
- No rotation of the rotary valve (airlock)
- High level detection below the rotary valve (airlock)
- High level detection above the rotary valve (airlock)

The new filter bags show a pressure differential of 0.5 to 0.7 inches water column. After a period of operation of the baghouse, the wood dust accumulated on the outside surface of the filter bags will create additional restriction for the gas flow and the pressure differential will then increase slowly to reach the electronic timer board HIGH LIMIT set point. At this time, the pulse cleaning system will automatically start to clean the bags. After a cleaning period, the measured differential pressure by the pressure module will decrease to reach the LOW LIMIT set point. At this time, the pulse cleaning will stop.

Normal Start-up Procedure

- All visual inspection shall be done of the baghouse unit to spot and prevent potential problems.
- Make sure all dust collector components are working and in proper mode. The baghouse can then be brought online.
- Do not allow higher than design filtration velocities or airflow.
- Check all monitoring devices for proper operation, and then document status.

Normal Shutdown Procedure

- The baghouse collector should ALWAYS stop by using the normal STOP SEQUENCE mode. This automatic sequence allows the system to purge all wood waste away from the dust collector.

When shutdown procedure starts, the planer mill operation stops first (planer, hog and trimmer). After a delay, the main fan (RCSB-5185) stops. A programmed delay then starts to allow the rotary valve and the equipment located downstream of the rotary valve to handle the wood waste. When the delay is reach, the rotary valve (airlock) stops. The same sequence continues up to the wood waste storage bin.

4. MALFUNCTION STOPS

If a malfunction (computer or mechanical) occurs, a hot stop will be initiated until the problem is corrected. If the problem cannot be corrected the mill cannot operate.

5. IDENTIFICATION OF SUPERVISORY AND MAINTENANCE PERSONNEL

An updated list of current supervisory and maintenance personnel shall be kept at the facility. Descriptions of the responsibilities of these individuals for operation of the plant during start-ups, shutdowns, or malfunctions, as well as inspections and repairs, shall be stated on the updated list.

6. DESCRIPTION OF INSPECTED ITEMS

A daily walk around inspection will be done each morning. The following items shall be inspected/observed:

- Roadways (fugitive dust)
- Baghouse stack (dust emission)
- Baghouse rotary valve (shaft seal, chain drive)
- Chutes from the baghouse rotary valve and the lower equipment (for any leaks)

Continued DESCRIPTION OF INSPECTED ITEMS:

- The baghouse will get a thorough inspection from the front inlet to the rear exhaust fan. This inspection will be done every month. The following items to be inspected are:
- Ductwork (inspected for thickness)
- Blow pipes, diaphragm valves (are they working, good connections)
- Bags and cages (condition of bags, age, number replaced recently)
- Rotary valve - shaft seals

7. REPLACEMENT PARTS

As required, the following shall be kept in stock at all times:

- A minimum of one (1) full set of filter bags.
- A minimum of ten (10) filter cages
- A minimum of four (4) RCA45T2 Goyen valve repair kits
- A minimum of two (2) RCA50T Goyen valve repair kits
- A minimum of 5 pounds of black light powder. (Recommended quantity for the number of square feet of baghouse cloth.)
- A minimum of five (5) tubes of silicone caulk for minor leaks on flanged joints.

8. MALFUNCTION/CORRECTIVE ACTION PLAN FOR BAGHOUSE

The following is a summary of potential malfunctions and corresponding corrective actions to be taken at BIEWER LUMBER PLANT located at McBain, MI.

POTENTIAL MALFUNCTION POSSIBLE CAUSE CORRECTIVE PROCEDURE/ OPERATIONAL CHANGE

Visible emissions from baghouse stack

- Filter bag broken, torn, or damaged.
- Identify, isolate, and replace the broken bag.
- Upon completion of corrective action, observe and recorded stack opacity.

Baghouse pressure above normal operating range

- May indicates that the cleaning system is not functioning properly.
- Verify cleaning system is online.
- Verify air pressure is online.
- Verify initiation point is set correctly.
- Repair as needed.

Baghouse pressure below normal operating range

- Filter bag broken, torn, or damaged.
- Identify, isolate, and replace the broken bag.
- Upon completion of corrective action, observe stack opacity.
- Note: These are just a few examples of possible problems that may occur with the fabric filter dust collector (baghouse).

All malfunctions and corrective action taken must be documented. Documentation will include a description of the malfunction, cause, and corrective action taken, the date and time of the malfunction, and the date and time period of the corrective action taken. Records shall be maintained for a period of at least 5 years.

9. PREVENTATIVE MAINTENANCE PROGRAM FOR THE FABRIC FILTER DUST COLLECTOR

The Preventative Maintenance Program for the Fabric Filter Dust Collector is for the purpose of keeping the dust collector in good operating condition, and thereby, maintaining the rated capture efficiency of the dust collector for the control of particulate matter.

a) Normal Operating Ranges

- The following are normal operating ranges of the process operation variables at the BIEWER LUMBER PLANT, McBain, MI that shall be monitored to detect an air pollution control equipment malfunction or failure.

b) Control Device Pressure Drop Range in Inches

- Indicated pressure differential across the filter bags (in inches WG)
 - o With new bags: 0.5 to 0.7 in. WG
 - o In operation after few weeks: 1.4 to 1.7 in. WG
- Any variations from these operating conditions are to be reported immediately to the Plant Manager.

c) Operating Pressure Drop

- The pressure drop across the fabric filter dust collector shall be continuously measured and the minimum pressure drop shall not be less than 1 inch, water gauge, except when a large number of filter bags have been replaced or other identified reason,

- The pressure drop across the fabric filter dust collector shall be recorded at least once per day and kept in a bound notebook. These data shall be recorded in the Daily Operations Logbook.

d) Handling and Storage of Fabric Filter Dust

- Accumulated fabric filter dust (particulate) shall be stored and/or be disposed of in a manner which minimizes the introduction of the air contaminants to the outer air.

e) Inventory of Spare Parts and Filter Bags

- An inventory of fabric filter bags shall be maintained by the facility owner or operator so that filter bags will be available to this site within four hours of requesting the filter bags. A full set of filter bags shall be kept on-site at all times. An inventory of other replacement parts for the fabric filter dust collector shall be maintained at all times.

- In addition, other spare parts for the dust collector pulse cleaning system, shaft seals, and door gaskets must be kept on site

10. RECORD OF PREVENTATIVE MAINTENANCE AND REPAIR REQUIREMENTS FOR BAGHOUSE

Records of maintenance and repair activities, including date, time, operator performing maintenance and repair, and description of activity, shall be maintained for a period of at least 5 years.

a) Piping and Seals Maintenance

Piping and seals shall be replaced as needed.

b) Black Light Inspections

- Black light test shall be conducted at least once per year. Black light inspection equipment and materials shall be available for use at the facility and used as needed.

c) Bag Maintenance

- Bag failures occur at varying times depending on the operation of the collector. Typical bag life is a function of the operating conditions. Bag failure can be spotted through daily monitoring and inspection, including broken bag detector alarm. Stack opacity is also a good indication of bag condition. If the plume is dirty, then some problem exists in the baghouse.

- Four ways to look at broken bags are:

1. Visual inspection for holes, tears, or leaks
2. Look for the accumulation of dust which can be related to nearby holes
3. Dust accumulation on the top tubesheet or in the blowpipe above the failed bag will be readily noticeable
4. Use of fluorescent powder and black light.

Biewer Sawmill will block off the affected bag. In a pulse-jet baghouse with top access, a plug is placed over the tubesheet hole of the failed bag. Once this is done the affected compartment can be brought back online with no increase in opacity.

11. ROUTINE PREVENTATIVE MAINTENANCE AND REPAIR REQUIREMENTS FOR BAGHOUSE

a) Routine Maintenance:

The two indicators of the performance of a baghouse (fabric filter dust collector) are collection efficiency and pressure drop. If the pressure drop across the baghouse (from dirty gas inlet to cleaned gas outlet) is satisfactory, the proper amount of air is moving through the baghouse. If the stack is clean, the baghouse is doing the job it was intended to do. Pressure drop is monitored by using a photohelic gauge. Additionally, a broken bag detector gauge is used to monitor particulate emissions that would indicate a bag failure. These items can be useful in determining maintenance and charting baghouse performance over time.

Observation and preventative maintenance will help in determining the overall quality of baghouse operations. Once the visual inspection of the physical components on the baghouse is completed, the operational data, both current and historical that may have a bearing on baghouse performance shall be evaluated. The purpose of this evaluation process is to:

- Monitor the system
- Identify those items that indicate problems prior to shut down
- Uncover the underlying causes so problems do not occur

Identify areas that require maintenance and/or repair areas that require monitoring and careful documentation include, but are not limited to, alterations in the operation of the baghouse or process changes. Many factors can have a substantial impact on baghouse performance, as such these items must be documented.

Items such as pressure drops and cleaning cycle adjustment shall also be documented for further analysis.

b) Spare parts:

Biewer Lumber plant should maintain the following spare parts in inventory.

- One (1) set of filter bags for the Cyclofilter
- Ten (10) filter bag cages
- Four (4) RCA45T2 Goyen valve repair kit
- Two (2) RCA50T Goyen repair kit valve
- Neoprene type gasket for inspection doors
- Calibrated washers for explosion vent panels
- Rubber tips for the dust collector rotary valve VR-4.85
- Rubber tips for the hog's cyclone rotary valve VR-2.50
- Bearings for the main fan RCSB-5185
- Bearings for the dust collector rotary valve VR-4.85
- Bearings for the hog's cyclone rotary valve VR-2.50
- V-belts for the main fan RCSB-5185
- Heat detector for the Cyclofilter
- Fuse links for the Cyclofilter fire damper
- One (1) motion detector XSAV-11801 for the rotary valve
- Electronic timer board with pressure module

One or more of these parts may be out of stock at any given time if it has been removed from inventory for use in its designated purpose. In which case, a replacement part will be promptly ordered to re-stock the inventory, accordingly.

12. ITEMS INCLUDED IN RECORDKEEPING

A written record in a bound notebook of the following shall be maintained by the owner or operator of the facility:

- Visual inspections of the interior components of the fabric filter dust collector, including date, time, and findings

- Black light inspections, including date, time, and findings
- Number of filter bags installed as a result of each inspection to replace filter bags already in use in the fabric filter dust collector, including date, time, location, and whether the replacement filter bag was brand new or a cleaned, previously used filter bag
- An explanation (i.e., a description of the damage found) for each filter bag removed from the fabric filter dust collector and confirmation that another filter bag was installed to replace it
- Each observation of visible emissions at the stack discharge point and description of response to the observed visible emission, including date and time of visible emission occurrence. Any such visible emission shall be recorded in the Daily Operations Log Book and made available upon request.
- All significant maintenance activities performed on the fabric filter dust collector.

13. Reporting of over opacity

- Reporting requirements of Rule 912 in the plan (any excess emissions that occur for more than 2 hours must be reported verbally or by email within 2 days and with a written report within 10 days)
- Communication from the department lead, Maint lead or Plant manager must take place within 48 hours of occurrence.
- The communication must be verbal or by email to the local representative – Kurt Child (DEQ) CHILDSK@Michigan.gov.