



Grayling Particleboard Startup, Shutdown, and Malfunction Plan

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STARTUP, SHUTDOWN, AND MALFUNCTION PLAN

ARAUCO GRAYLING PARTICLEBOARD MILL

TABLE OF CONTENTS

TABLE OF CONTENTS.....	3
INTRODUCTION AND SCOPE	4
PURPOSE OF SSMP	4
SCOPE OF SSMP	5
PARTICLE BOARD DRYERS AND PRESS/COOLER	5
PROCESS DESCRIPTION.....	5
STARTUP PROCEDURES	6
PARTICLEBOARD SHUTDOWN PROCEDURES	8
PARTICLEBOARD MALFUNCTIONS	9
RECORDKEEPING AND REPORTING	11
RECORDKEEPING	11
PERIODIC REPORTING	12
IMMEDIATE REPORTING	13
SSMP REVISIONS	13

INTRODUCTION AND SCOPE

Arauco's Grayling Mill (Arauco Grayling) has prepared this document including the procedures and systems detailed herein for the Grayling Mill to satisfy specific requirements contained in the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Source Categories, 40 CFR Part 63. The applicable MACT rules are contained in 40 CFR Part 63, Subpart A; the General Provisions applicable to all Part 63 source categories and Subpart DDDD for Plywood and Composite Wood Products (PCWP MACT) facilities.

PURPOSE OF SSMP

Per 40 CFR 63.6(e)(3), Arauco has developed this startup, shutdown, and malfunction plan (SSMP) to identify good air pollution control practices for minimizing emissions of HAPs during periods of startup, shutdown and malfunction of affected equipment in the process.

40 CFR 63.6(e)(3) specifies the following requirements for SSMPs (emphasis added):

Startup, shutdown, and malfunction plan. (i) The owner or operator of an affected source must develop a written startup, shutdown, and malfunction plan that describes, in detail, procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction; and a program of corrective action for malfunctioning process, air pollution control, and monitoring equipment used to comply with the relevant standard. ***The startup, shutdown, and malfunction plan does not need to address any scenario that would not cause the source to exceed an applicable emission limitation in the relevant standard.*** This plan must be developed by the owner or operator by the source's compliance date for that relevant standard. The purpose of the startup, shutdown, and malfunction plan is to:

- Ensure that, at all times, the owner or operator operates and maintains each affected source, including associated air pollution control and monitoring equipment, in a manner which satisfies the general duty to minimize emissions established by paragraph (e)(1)(i) of this section;
- Ensure that owners or operators are prepared to correct malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants; and
- Reduce the reporting burden associated with periods of startup, shutdown, and malfunction (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation).

This plan identifies all startup, shutdown, and malfunction events which have the potential of causing excess emissions for affected sources. Since the mill has just been constructed and is being started up, this plan will be updated as needed if the mill experiences malfunctions not identified in the plan or operating procedures are changed.

SCOPE OF SSMP

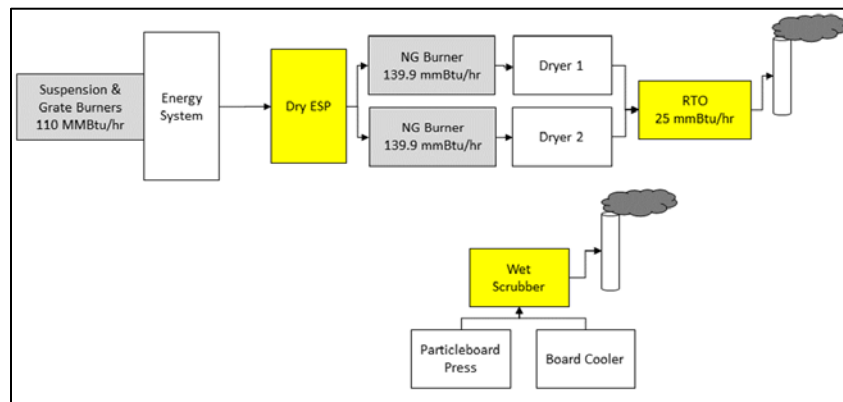
The following emission units, located at this Facility, are subject to the PCWP MACT standard, thus qualifying as MACT regulated system that are required to be addressed in the facility MACT SSM plan:

1. Two Particleboard Rotary Drum Dryers and associated heat sources (wood fired energy system (EUENERGY) and natural gas burners. These systems are controlled by a RTO (FGDRYERRTO) meeting a control requirement (90% reduction or minimum concentration of VOC, formaldehyde or methanol) in Table 2 of the standard. The dryers are identical but may be operated independently from each other. The RTO operates with 3 combustion chambers when both dryers are operating at capacity, and may operate with 2 chambers if only one dryer is operating. A 4th RTO combustion chamber is used as a backup in case of failure or maintenance requirement of one chamber. Each chamber contains its own induced draft fan and can be operated independently of the other chambers.
2. Particleboard Press and Board Cooler (FGPRESSCOOL) meeting the production based compliance limit in Table 1 of the standard. Although equipped with a wet scrubber, the scrubber is not being used for MACT compliance. Critical operating parameters to be monitored for continuous compliance have yet to be identified. This plan will be updated after the initial compliance demonstration has been completed.

PARTICLE BOARD DRYERS AND PRESS/COOLER

PROCESS DESCRIPTION

The figure below presents the air flow diagram of the Particleboard Dryer systems, Press and Cooler.



STARTUP AND SHUTDOWN PROCEDURES

The following section provides definitions and indicators for startup and shutdown events.

Startup is defined in the PCWP as “the setting in operation of an affected source or portion of an affected source for any purpose.” During a startup period, there is a potential that emissions could exceed the regulatory limitations as a result of normal startup operation.

Shutdown is defined as “the cessation of operation of an affected source or portion of an affected source for any purpose.” During a shutdown period, there is a potential that emissions could exceed the regulatory limitations as a result of normal shutdown operation.

DRYER/RTO SYSTEM

For the purposes of this SSM plan, criteria have also been provided for both a cold startup and shutdown, as well as a warm startup and shutdown of the dryer/RTO system. The warm shutdown and startup criteria apply to operating scenarios where production may be temporarily idled for any number of reasons.

The dryers may startup and operate with heat from both the gas burners and the wood-fired energy unit (EUEnergy) or with heat only from the natural gas burners. Note that the 2 dryers may operate independently from each other, the procedures listed are for startup and shutdown for either one or two dryers.

The beginning and ending of startup/shutdown events for FGDRYERRTO at the Grayling facility are identified as follows:

	COLD STARTUP -	COLD SHUTDOWN	WARM STARTUP	WARM SHUTDOWN
Begins:	Propane used to warm up EUEnergy (alternatively: gas burner started up if EUEnergy is off line)	Start lowering wood feed rate to dryer for the purpose of initiating a shutdown	EUEnergy wood feed increased (alternatively, natural gas burners startup if EUEnergy is off line).	Stop wood feed to dryer
Ends:	The dryer exhaust temperature is within 20°F of setpoint, and the dryer has operated at steady state for a reasonable amount of time since startup began.	All wood is out of dryer and no more being fed, the dryer gas burner is off-line, no more wood on the grate in EUEnergy, system is cooled and fans are off.	The dryer exhaust temperature is within 20°F of setpoint, and the dryer has operated at steady state for a reasonable amount of time since startup began.	All wood out of dryer, EUEnergy dust burners are off, grate at minimum firing for idle mode and exhausted to bypass stack, and warm startup begins.

The Arauco Grayling Mill follows the internal standard operating procedures for startup of the particleboard dryers. The Mill has identified the following key parameters to verify that the dryers and the supporting systems have reached steady state and are prepared to begin normal operations and meet the emission limitations in the standard. These key parameters are monitored in order to minimize emissions during startup. The critical steps of the normal cold startup procedure to minimize emissions are as follows:

- 1) Confirm previous shutdown is complete (e.g., no flakes are in the dryers).
- 2) Turn on combustion fans and induced draft dryer fans as well as induced draft RTO fans. Confirm exhaust from the empty dryers are being routed through 3 chambers of the RTO. Exception: If one dryer is not operating and only one dryer is being started up, ensure the exhaust is routed through 2 RTO chambers.
- 3) Bring the RTO chambers up to temperature (at least 3 chambers for 2 dryer operation, 2 chambers for 1 dryer operation). This is shown as a 15-minute average in the process control system. Until the initial compliance test is completed later in 2019, the setpoint of the RTO combustion chambers is 1600 F.
- 4) Bring the dryer(s) up to proper operating temperature with the use of natural gas burners and/or heat from the wood energy system
- 5) After the above conditions are satisfied, flakes may be introduced to the dryer(s).

The following steps are utilized for a cold shutdown to minimize emissions:

- 1) Stop flake feed and ensure all wood material is out of the dryers.
- 2) Shut down gas burners. Divert wood energy plant to bypass or shutdown wood energy plant.
- 3) After all flakes are out of the dryers, shutdown the RTO burners. Shutdown the fans after the systems have cooled.

The EUEnergy system may be temporarily idled which is defined as a warm shutdown. Idling the system on a temporary basis minimizes emissions that occur from the wood fired energy system compared to a cold startup. Emissions are minimized because the length of time needed to startup has been minimized. At all times during a warm startup and shutdown, there will be no wood fed into the dryer unless the RTO is operating at the minimum temperature on a 15-minute average.

The procedures for EUEnergy during a warm shutdown is as follows:

- Dust burners shut off immediately upon diversion of exhaust to bypass stack
- Grate fuel feed reduced to minimum idle fire mode (13 MMBtu/hr)

For an unplanned shutdown as a result of a malfunction, the systems will be shutdown in the same manner to the extent practical. Some minor malfunctions can cause a controlled shutdown, while major malfunctions (such as an electrical outage or fire) do not allow that option.

PRESS/COOLER SYSTEM

The Arauco Grayling Mill follows the internal standard operating procedures for a planned startup of the particleboard press.

For the press and cooler startup procedures prior to introducing mat:

- o Ensure that the vent fan is on and operating to pull gases from the press to the outlet duct to the scrubber. Confirm the press is at the proper operating temperature. Other critical operating parameters for HAP emission compliance will be determined and confirmed with the initial compliance test later in 2019. This SSM plan will be updated to reflect the critical operating parameters that are identified.

The Arauco Grayling Mill follows the internal standard operating procedures for a planned shut down the particleboard press. For the purpose of defining shutdown as it pertains to the PCWP MACT regulation, the Mill has identified the following key steps to verify that the

systems have concluded normal operations and are prepared to shutdown while minimizing emissions as follows.

- 1) Stop loading mat to the press and ensure that all mat/board has been processed through the press and cooler.
- 2) Shutdown the fan that pulls gases from the press to the wet scrubber.

For an unplanned shutdown as a result of a malfunction, the systems will be shutdown in the same manner to the extent practical. Some minor malfunctions can cause a controlled shutdown, while major malfunctions (such as an electrical outage or fire) do not allow that option.

PARTICLEBOARD MALFUNCTIONS

Important Notes

- 1) Malfunctions that are associated with startup or shutdown conditions are covered under the Startup and Shutdown Procedures of this Plan and do not need to be considered as malfunctions, or reported as malfunctions, under this Plan.
- 2) If a malfunction is temporary and is resolved quickly before the dryer (or press) system has completed a warm or cold shutdown, flake feed may resume to the dryers (or mat to the press) and the system brought back to normal production.
- 3) The scope of this plan is related to malfunctions that can cause an exceedance of the emission limitation in the MACT standard. While there are many malfunctions that can occur in the dryer systems or the press that can cause the systems to be shutdown, there are only a limited number of malfunctions that could cause emissions in excess of the PCWP MACT standard.

DRYER/RTO MALFUNCTIONS

There are several operating scenarios which would be considered normal operations of the dryer/RTO system and not a malfunction. These operating scenarios are as follows:

Typical operation consists of the following:

Both dryers operating

Heat provided by gas burners and wood energy plant

RTO chambers: 3 are in service while the 4th is in standby (held at temperature)

There are several alternate normal operations as follows:

- 1) Heat provided by gas burners only (energy plant shutdown or bypassed on low fire)
- 2) One dryer operating while one is down for maintenance or repair. One dryer exhausts to 2 of 4 RTO chambers
- 3) One RTO chamber out of service for maintenance or repair when 2 dryers are operating
- 4) One or two RTO chambers are out of service for maintenance or repair when 1 dryer is operating

MALFUNCTION	CORRECTIVE ACTION
Process control or safety device causes dryer to exhaust to emergency bypass stack instead of the RTO	Shutdown affected dryer (stop flake feed, shutdown or bypass heat sources, run flakes out of dryer, cool then shut down ID fans)
Dryer is exhausted to an RTO chamber which is not maintaining 15-minute minimum temperature established by stack test*	Switch exhaust to the standby RTO chamber. If not available within 15 minutes, shutdown affected dryer (stop flake feed, shutdown or bypass heat sources, run flakes out of dryer, cool then shut down ID fans)
Loss of power	Activate emergency generator to rotate dryers so flakes can be removed

*Until initial compliance test is completed, minimum 15-minute average RTO temperature is 1600 F

Malfunions that could cause an RTO chamber to be below minimum 15-minute temperature while receiving dryer exhaust include, but are not limited to, the following causes:

- Loss of flame through burner malfunction, loss of fuel or fuel pressure
- Malfunctioning thermocouples or process control problems, including continuous monitoring system (RTO chamber temperature)
- Mechanical issues such as can rotation failure or ID fan failure that cause the RTO chamber into automatic shut down (safety)
- Power outage or power fluctuations

PRESS AND COOLER

Since the Press and Cooler will meet the production based limitation under PCWP MACT and critical operating parameters are yet to be identified for compliance testing, this section will be updated once this information is available. Malfunions will be identified that cause the press

and cooler to operate outside of the critical operating parameters established in the initial compliance test.

RECORDKEEPING AND REPORTING

During periods of SSM events, the facility is required to operate and maintain the MACT regulated systems in accordance with the procedures outlined in its SSM Plan. In addition to the requirements to operate and maintain the MACT regulated systems, there are also recordkeeping and reporting requirements that are required by the MACT Rules in order to document that proper procedures are followed during Startup, Shutdown, and Malfunction events. The procedures outlined below will be followed to ensure that such events are excluded from excess emissions determinations.

RECORDKEEPING

The Arauco Grayling Mill will keep records of the following events for the dryers and press and cooler:

- The occurrence and duration of each startup and shutdown;
- The occurrence and duration of each malfunction that results in, or has the potential to result in, an exceedance of an applicable MACT standard;
- The occurrence and duration of each malfunction of associated air pollution control and monitoring equipment;
- All maintenance performed on associated air pollution control and monitoring equipment;
- All information necessary to demonstrate conformance with this SSM Plan when all actions taken during periods of startup, shutdown, and malfunction are consistent with the procedures;
- Actions taken during periods of startup, shutdown, and malfunction when such actions are different from the procedures specified in this SSM Plan, including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation; and
- Each period during which a continuous monitoring system (CMS) is malfunctioning or inoperative, including out-of-control periods.

The following are general Mill recordkeeping requirements:

- The Mill maintains files of all information (including all reports and notifications) required with the environmental files located in the Environmental Department. The files are available for inspection and review.
- The files are retained on-site for two (2) years and maintained either on-site or in storage for an additional three (3) years.
- Files are maintained in an electronic format.

PERIODIC REPORTING

The Environmental Manager conducts the following reporting activities for actions during a startup, shutdown, or malfunction event resulting in a MACT excess emission that occur during the specified reporting period (e.g., semiannual) of a MACT regulated system. This includes actions taken to correct a malfunction that are consistent with the procedures specified in this SSM Plan.

- **Periodic SSM Report Contents:**
 - A cover letter including the name, title, and signature of the responsible Mill official who is certifying its accuracy.
 - A summary of the SSM events during the reporting period that resulted in excess emissions for 1 hour or longer, and the duration of each event.
- **Submittal Requirements:**
 - Postmarked by the 30th day following the end of each calendar half (or other calendar reporting period, as appropriate).
 - Submitted simultaneously with the excess emissions and continuous monitoring system performance (or other) reports.

Please note the following key considerations associated with SSM reporting:

1. The Grayling Mill will include all excess emission events as part of the semi-annual excess emissions reports required by 40 CFR §63.10(e)(3).
2. § 63.10(b)(2)(ii) and (iii) identify that records documenting the occurrence and duration of each startup, shutdown, and malfunction of the process equipment and air pollution control and monitoring equipment be maintained; however, pursuant to § 63.10(d)(5)(i), the reporting requirements are different for SSM events depending upon if there is excess emissions that occur during the event and/or if the SSM Plan was followed.
 - a) If there are no excess emissions that occur during the SSM event and the SSM Plan procedures are followed, then only a statement that the “actions taken during the SSM event were consistent with the procedures specified in the SSM Plan” needs to be included in the SSM report.
 - b) If there are no excess emissions that occur during the SSM event and the SSM Plan procedures are not followed, then the event needs to be identified in the SSM report.
 - c) If there are excess emissions that occur during the SSM event, then an excess emissions report pursuant to § 63.10(e)(3) needs to be developed in addition to the SSM report.

IMMEDIATE REPORTING

The Environmental Manager will submit an Immediate Startup, Shutdown, and Malfunction Report at any time an action taken during a startup, shutdown, or malfunction (including actions taken to correct a malfunction) is not consistent with the procedures specified in the SSM Plan AND the source exceeds any applicable emission limitation in the relevant emission standard.

- Immediate SSM Report Contents:
 - A cover letter containing the name, title, and signature of the responsible Mill official who is certifying its accuracy.
 - The circumstances of the event.
 - The reasons for not following the SSM Plan.
 - The occurrence of any excess emissions and/or parameter monitoring exceedances.
- Submittal Requirements:
 - Immediately report via a telephone call or a facsimile transmission to the Administrator within two (2) working days after commencing actions inconsistent with the plan.
 - Submit a follow-up letter within seven (7) working days after the end of the event.

SSMP REVISIONS

Revisions to this SSMP may be precipitated upon process modifications, SSM events, or based upon a determination that the plan is inadequate.

The SSMP may be revised periodically as necessary to reflect changes in equipment or procedures at the affected source. Revisions may be made without prior approval by the permitting authority. However, revisions must be reported in the semi-annual report.

In the event that this document inadequately addresses or fails to address a malfunction, this SSMP should be modified within 45 days of the event (40 CFR 63.6(e)(3)(viii)). The modifications must include procedures for operating and maintaining the source during similar malfunction events, along with a corrective action plan.

In the event that a revision alters the scope of the activities that are deemed to be startups, shutdowns, or malfunctions, or otherwise changes the applicability of any requirement in an applicable standard, the revised plan will not take effect until written notification describing the change is provided to the permitting authority.

The previous version of the plan should be maintained on-site and be made available to the permitting authority for a period of 5 years after the revision.