# 03-28-2001 SSM PLAN OUTLINE– PANAMA CITY MILL

THE FOLLOWING SSM PLAN OUTLINE IS THE TEXT VERSION OF THE SSM PLAN FOR THE PANAMA CITY MILL THAT HAS BEEN CONVERTED TO ELECTRONIC FORMAT IN A FINAL, LINKED, WEB-BASED, OPERATOR INTERACTIVE, LAN VERSION OF THE PLAN.

THE ATTACHED OUTLINE INCLUDES A LIST OF POTENTIAL EXCESS EMISSIONS AND FOUL CONDENSATE OVERLOWS THAT WOULD TRIGGER THE CLUSTER RULE SSM REQUIREMENTS. FOR THE PANAMA CITY MILL, THERE ARE SIX (6) SEPARATE PROCESS SSM MODULES. INCLUDED IN EACH SSM PROCESS MODULE ARE SEPARATE STARTUP, SHUTDOWN AND MALFUNCTION EMISSION (OR SPILL) MINIMIZATION PROCEDURES AND REPORTS, AS WELL AS A DESCRIPTION OF PROCESS.

THE SSM PLAN IS A LIVING DOCUMENT THAT CAN BE CHANGED AT ANY TIME. THE SSM PLAN SHOULD BE REVIEWED AND EDITED BY THE MILL'S DESIGNATED SSM PLAN EDITOR AND RETURNED WITH CORRECTIONS OR CHANGES TO JAN FEKERTY IN OUR JACKSONVILLE OFFICE FOR PERMANENT MODIFICATIONS TO THE PLAN.

# CLUSTER RULE
# Startup, Shutdown, and Malfunction (SSM) Plan

## Startup, Shutdown, and Malfunction Plan Requirements:

"The owner or operator of an affected source shall develop and implement a written SSM 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 and air pollution control equipment used to comply with a relevant standard." At all times, including SSM, the owner must operate any source and associated control equipment in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by all relevant standards. Malfunctions must be corrected as soon as practicable in accordance with the SSM plan.

**At the Panama City Mill a Startup, Shutdown and Malfunction Plan is required for : The LVHC NCG collection/combustion system, the Foul Condensate collection system, the Condensate Treatment System, the Batch Digester System, the Pulp Bleaching System, and the Evaporator System.**

**The following SSM Plan is organized by process area and includes Startup or Shutdown Plans for each area as well as a response to Malfunction excess emissions or foul condensate spills. The key to implementing this plan is recognizing the occurrence of the Startup or Shutdown or excess emissions or regulated "foul" condensate spills. Eventually, electronic prompting of the operator by these excess emission events or spills is anticipated. The result of following the SSM plan is the documentation required by the regulation as follows:**

# Documentation for Startup, Shutdown, Malfunction Plan

The following information must be recorded by the **Operator**:

1. Occurrence and duration of each startup, shutdown or malfunction of process equipment;
2. Occurrence and duration of each startup, shutdown or malfunction of air pollution control equipment;
3. Actions taken during periods of startup, shutdown or malfunction if such actions are different from the procedures specified in the SSM plan;
4. Documentation that demonstrates conformance with the SSM plan when actions are taken in accordance with the SSM plan;
5. Each period (dates and times) when a continuous monitoring system is inoperative or malfunctioning;
6. Dates and times of excess emissions and parameter monitoring exceedences during startup, shutdown and malfunction conditions;
7. Corrective actions taken or preventive measures adopted to remedy malfunction conditions.

The following information must be recorded by the **Operator** from information supplied by the **Maintenance Department**:

1. Nature and cause of each malfunction (if known).
2. All maintenance performed on process or air pollution control equipment to repair a SSM malfunction.

The following information must be recorded by the **Maintenance Department**:

1. All routine or regular maintenance performed on the air pollution control equipment required for compliance with the Cluster Rule (i.e. – Condensate treatment - Steam Stripper, etc. or NCG or SOG Combustion – Lime Kiln, No. 3 or No. 4 Power Boiler).
2. All calibrations or work done on the monitoring system required by the Cluster Rule (Stripper steam, Bleach Plant Scrubber, condensate, temperature, spills, bypass valves).

Following are examples of venting or condensate spills that will trigger SSM requirements and examples of how the electronic (linked) version SSM plan will be organized to respond: **(NOTE: THE FOLLOWING "LINKED" PROCESS SSM PLANS ARE COLOR CODED)**

1. The SSM plan is triggered when an NCG source is operating and the LVHC-NCG system collection valve at the source is open. These LVHC-NCG collection system source valves are located at evaporator/concentrator hotwells and/or after-condenser vent, (batch) Blow Heat Accumulator 2nd Condenser, turpentine condensers and decanters, foul condensate collection tanks, and stripper feed tanks.

   Example: In the case of the operator receiving information that the LVHC-NCG source vent collection valve at the evaporator hotwell is open and venting as a result of a malfunction of a NCG system component, the operator would be automatically directed or would:

   - **Trigger the SSM plan for the LVHC-NCG collection system**
   - **Choose the LVHC-NCG collection system - malfunction SSM plan**
   - **Follow the plan and then complete the NCG system - malfunction SSM report**.

2. Bypass of the NCG or SOG combustion device is to be monitored. Even though bypass of the combustion device could occur for as much as 87.6 hours/yr. without permit violation, the SSM plan is required whenever the backup device fails and the bypass valve is open venting gas to the atmosphere. As there is no backup device for SOG combustion, and the stripper is bottled up when the No. 3 Boiler is bypassed, the SSM plan for the SOG combustion system is simple. In the case of NCG combustion device bypass, the SSM plan, specific to the NCG combustion device bypassed (Kiln or No. 4 Power Boiler) should be followed in the event of bypass valve opening.

   Example: In the case of the digester or evaporator systems operating **and** the bypass valves being open at both primary, Kiln, and secondary, No. 4 Boiler, NCG combustion devices, the operator would be automatically directed or would:

   - **Trigger the SSM plan for the Kiln**
   - **Choose the Kiln - malfunction SSM plan**
   - **Follow the plan and then complete the NCG system - malfunction SSM report**.

3. The SSM plan is triggered when a source diversion valve on the foul condensate collection system is open (typically due to high conductivity) or there is an overflow of a hotwell or other foul condensate tank or line (pump failure) while the source is operating. The source diversion valves are located at the evaporator/concentrator hotwells, turpentine decanter, (batch) blow heat accumulator overflow, and NCG system condensate collection tanks. (Note: The SSM plan is triggered by hotwell overflow only if the evaporator hotwell is connected to the foul condensate collection system.)

   Example: In the case of the operator becoming aware of the diversion of the turpentine decanter underflow (condensate) to the sewer while the digester system is operating, the operator would be automatically directed or would:

   - **Trigger the SSM plan for the Foul Condensate Collection System SSM Plan**
   - **Choose the Foul Condensate Collection system – malfunction SSM plan**
   - **Follow the plan and then complete the Foul Condensate Collection System - malfunction SSM report**.

# SSM PLAN "TRIGGER" LIST

**(SSM PLANS IN THE FOLLOWING DOCUMENT ARE LINKED TO THE LIST OF "SSM TRIGGER EVENTS" BY COMMON COLOR)**

- **NCG COLLECTION / COMBUSTION SYSTEM STARTUP**
- **NCG COLLECTION / COMBUSTION SYSTEM SHUTDOWN**
  **No. 4 POWER BOILER NCG Combustion System Bypass**
- **LIME KILN NCG Combustion System Bypass**
- **NCG COLLECTION SYSTEM Rupture Disk Failure**
- **NCG COLLECTION SYSTEM Steam Eductor System Failure**
- **1-A EVAPORATOR NCG SYSTEM Source Vent Valve Opening**
- **2 EVAPORATOR NCG SYSTEM Source Vent Valve Opening**
- **3 EVAPORATOR NCG SYSTEM Source Vent Valve Opening**
- **1-A EVAPORATOR NCG SYSTEM Rupture Disk Opening**
- **2 EVAPORATOR NCG SYSTEM Rupture Disk Opening**
- **3 EVAPORATOR NCG SYSTEM Rupture Disk Opening**
- **B.H. ACCUMULATOR 2$^{NDARY}$ CONDENSER NCG Vent Valve Opening**
- **B.H. ACCUMULATOR 2$^{NDARY}$ CONDENSER NCG Rupture Disk Opening**
- **TURPENTINE CONDENSER NCG SYSTEM Rupture Disk Opening**
- **TURPENTINE DECANTER NCG SYSTEM Source Vent Valve Opening**
- **TURPENTINE CONDENSER NCG SYSTEM Rupture Disk Opening**
- **TURPENTINE DECANTER NCG SYSTEM Source Vent Valve Opening**

- **FOUL CONDENSATE COLLECTION SYSTEM STARTUP**
- **FOUL CONDENSATE COLLECTION SYSTEM SHUTDOWN**
- **FOUL CONDENSATE SYSTEM Turpentine Decanter Overflow**

- **STRIPPER and NO 3 BOILER SOG COMBUSTION SYSTEM STARTUP**
  **STRIPPER and NO. 3 BOILER SOG COMBUSTION SYSTEM SHUTDOWN**
- **No. 3 POWER BOILER Stripper Off-Gas Combustion System Bypass**
- **STRIPPER SYSTEM Feed Tank Overflow**
- **STRIPPER OFF GAS (SOG) Rupture Disk Failure**
- **STRIPPER SYSTEM Steam-to-Condensate Ratio Imbalance**
- **STRIPPER SYSTEM Steam flow Monitor Failure**
- **STRIPPER SYSTEM Condensate flow Monitor Failure**
- **STRIPPER SYSTEM Condensate feed temperature Monitor Failure**
- **STRIPPER SYSTEM Stripped Condensate temperature Monitor Failure**

- **DIGESTER SYSTEM STARTUP**
- **DIGESTER SYSTEM SHUTDOWN**
- **DIGESTER SYSTEM BLOW TANK Pressure Relief**
- **DIGESTER SYSTEM B.H ACCUMULATOR Tank Pressure Relief**
- **DIGESTER SYSTEM B.H. ACCUMULATOR Condensate High Conductivity**
- **DIGESTER SYSTEM B.H. ACCUMULATOR Condensate Overflow**

# SSM PLAN "TRIGGER" LIST (continued)

**(SSM PLANS IN THE FOLLOWING DOCUMENT ARE LINKED TO THE LIST OF "SSM TRIGGER EVENTS" BY COMMON COLOR)**

- **BLEACHING SYSTEM STARTUP**
- **BLEACHING SYSTEM SHUTDOWN**
- **BLEACH PLANT VENT COLLECTION SYSTEM Bypass or Vent**
- **BLEACHING SYSTEM SCRUBBER pH or ORP Range Alarm**
- **BLEACHING SYSTEM SCRUBBER Gas Flow Range Alarm**
- **BLEACHING SYSTEM SCRUBBER Liquid Flow Alarm**
- **BLEACHING SYSTEM SCRUBBER System Electrical or Mech. Failure**

- **1-A EVAPORATOR SET STARTUP**
- **1-A EVAPORATOR SET SHUTDOWN**
- **1-A EVAPORATOR SET Hogging Jet Operation***
- **1-A EVAPORATOR SET Condensate High Conductivity Diversion****
- **1-A EVAPORATOR SET Hotwell Overflow****
- **2 EVAPORATOR SET Startup**
- **2 EVAPORATOR SET Shutdown**
- **2 EVAPORATOR SET Hogging Jet Operation***
- **3 EVAPORATOR SET Startup**
- **3 EVAPORATOR SET Shutdown**
- **3 EVAPORATOR SET Hogging Jet Operation***

***at times other than startup when the evaporator is operating on liquor**

**** only when <u>not</u> producing Bleached Hardwood Pulp**

**THE SSM PLAN FOR THE**
**NON-CONDENSABLE GAS (NCG) COMBUSTION/COLLECTION SYSTEM**
**HAS BEEN TRIGGERED!**

**PLEASE SELECT THE APPROPRIATE SSM PLAN OR INFORMATION:**

1. **NCG SYSTEM START-UP PLAN & REPORT FORMS**
2. **NCG SYSTEM SHUTDOWN PLAN & REPORT FORMS**
3. **NCG MALFUNCTION PLAN & REPORT FORMS**
4. **NCG SYSTEM DESCRIPTION & FLOW DIAGRAM**

# 1. NON-CONDENSABLE GAS (NCG) COLLECTION/COMBUSTION SYSTEM STARTUP EMISSIONS MINIMIZATION CHECKLIST

The plan for the transition from startup to normal NCG system operations and a checklist for the minimization of emissions during the LVHC NCG system start-up follows.

Prior to operating the digester and evaporator systems generating Non-Condensable Gas (NCG), the NCG Collection and Combustion system must be operating. The period of time defining the startup of the NCG Collection/Combustion System is as follows: the startup of the NCG system begins with the introduction of Non-Condensable Gas from any LVHC source to the NCG Collection/Combustion system. The startup of the NCG Collection/Combustion system ends with the successful addition of the last digester or evaporator system NCG vent stream to the system.

Pre-Startup Checklist

- Is the LVHC NCG Collection system operating and is an adequate and consistent supply of steam available for the operation of the steam eductors?
- Have all the drain valves been closed and the proper water levels established for the LVHC NCG condensate loop seals, low point drains, and mist eliminator drains?
- Do all NCG system rupture discs appear to be closed and do the flame arresters appear to be in the normal operating condition?
- If the No. 4 Power Boiler is to be used for NCG combustion: Is the No. 4 Boiler operating steadily at furnace temperatures above 1600$^{o}$F, have the flame safety permissives been met, is the oil burner operating, and is steam flowing to the NCG burner?
- If the Lime Kiln is to be used: Is the Lime Kiln operation stable and balanced, does the chain zone and burner zone of the kiln body contain lime mud, is the flow of lime mud to and calcined lime from the kiln steady, is the front-end and burner operation stable and is the flame safety system operating and has the system verified that all permissives have been met, is the kiln body rotation at the appropriate speed, is the kiln body under a slight negative pressure, and has the minimum temperature of 1600$^{o}$F been reached in the Kiln combustion zone?

Startup Emissions Minimization Checklist

- The vent collection systems for each process system will be diverted into the collection header (and NCG source vents closed), one at a time. If addition of any source vent disrupts No. 4 Boiler or Kiln operation, the No. 4 Boiler or Kiln will be allowed to reach a normal operating state prior to switching the next LVHC source into the collection header.

- Startup each area process source and collect the LVHC NCG vent gases into the collection header following the startup procedures for each process system, and check all NCG gas vents to verify that the control valves are in the proper position.

THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!

# ***NCG SYSTEM SSM STARTUP INCIDENT REPORT:***

***WAS THE SSM CHECKLIST FOLLOWED IN NCG SYSTEM STARTUP*?*** _____

***TIME FIRST LVHC PROCESS SOURCE VENT ADDED TO NCG SYSTEM*** _____

***TIME LAST LVHC PROCESS SOURCE VENT ADDED TO NCG SYSTEM*** _____

***TIME OF NCG SYSTEM VENTING DUE TO STARTUP INITIATION:*** _____

***TIME THAT NCG VENTING DUE TO STARTUP ENDED:*** _____

***OPERATOR NAME:*** _____ ***TIME:*** _____ ***DATE:*** _____

****IF THE SSM PLAN WAS NOT FOLLOWED IN STARTING THE NCG SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:*** _____

_____

## 2. NON-CONDENSABLE GAS (NCG) COLLECTION/COMBUSTION SYSTEM SHUTDOWN -EMISSIONS MINIMIZATION CHECKLIST

Below is the plan for the transition from normal NCG system operations to shutdown and a checklist for the minimization of emissions during the LVHC NCG system shutdown.

Prior to stopping operation of the NCG Collection and Combustion system, the operation of all the digester and evaporator systems generating Non-Condensable Gas (NCG) must be suspended. The period of time defining the shutdown of the NCG Collection/Combustion System is as follows: the shutdown of the NCG system begins with the shutdown of any LVHC process source vented to the NCG Collection/Combustion system. The shutdown of the NCG Collection/Combustion system ends with the shutdown of the last NCG combustion system, the No. 4 Boiler or Lime Kiln.

NCG Collection/Combustion System Pre-Shutdown Checklist
The following conditions must be verified prior to shutdown of the system.

- Shutdown of all evaporator and digester system sources of LVHC vent gases has been planned following the appropriate shutdown procedures?

- Will the fuel, steam, and power necessary to operate the NCG Collection/Combustion system during the shutdown of the digester and evaporator systems be available?

Shutdown Emissions Minimization Checklist

- The destruction of vent gas streams should continue until the generation, collection, and transportation systems have been shutdown or when the temperature measured in the combustion zone falls below the minimum temperature requirement.

- Proceed to shut down all LVHC collection system equipment, such as ejectors, coolers, and scrubbers.

- Divert the NCG vent gas streams to the No. 4 Boiler, if available, or to the atmosphere and purge the firing systems with air or steam prior to shutdown of the Lime Kiln. When shutting the No. 4 NCG burner, also purge the NCG line to the boiler with air or steam prior to shutdown of the Boiler.

NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!

# ***SSM SHUTDOWN INCIDENT REPORT:***

***WAS THE SSM CHECKLIST FOLLOWED IN NCG SYSTEM SHUTDOWN*? _____***

***TIME OF FIRST LVHC PROCESS SOURCE SHUTDOWN _____***

***TIME THE LAST NCG COMBUSTION DEVICE IS SHUTDOWN _____***

***TIME THAT NCG SYSTEM VENTING DUE TO SHUTDOWN BEGAN: _____***

***TIME THAT NCG SYSTEM VENTING DUE TO SHUTDOWN ENDED: _____***

***OPERATOR NAME: _____ DATE: _____ TIME:_____***

****IF THE SSM PLAN WAS NOT FOLLOWED IN SHUTTING THE NCG SYSTEM DOWN, PLEASE EXPLAIN WHAT WAS DONE: _____***
***_____***

## 3. NON-CONDENSABLE GAS (NCG) COLLECTION/COMBUSTION SYSTEM MALFUNCTION- EMISSIONS MINIMIZATION CHECKLIST

Below is a description of the various malfunctions and associated operational events for the LVHC NCG Collection and Combustion system with the corresponding emissions minimization information. These malfunctions and events include such issues as safety interlocks, process alarms, and equipment failures. The malfunctions listed are those that would likely cause excess emissions of pulping vent gases.

| **Event** | **Malfunction and Emissions Minimization Steps** | **Operational Effect(Note 1)** |
|---|---|---|
| Rupture Disc Failure | Malfunctions<br>Over Pressurization<br>Emissions minimization steps<br>Isolate the rupture disc and replace as soon as practicable.<br>Investigate the cause of over pressurization and correct any operational problems. | O, B |
| Loss of Steam Pressure | Malfunctions<br>Low Steam Header Pressure<br>Emissions minimization steps<br>Determine the extent of the loss of steam pressure immediately. If steam pressure can be restored in a timely fashion, then resume normal operations of the LVHC as soon as practicable.<br>If the malfunction will require an extended time to correct, begin to shutdown LVHC sources in a deliberate manner, when practicable. | B, S |
| Combustion Unit - Flame Failure or Low Temperature or Temperature Monitor Malfunction | Malfunctions<br>Temperature Probe Failure<br>Flame failure<br>Improper air to gas ratio<br>Emissions Minimization Steps<br>Investigate the cause of the low temperature: temperature probe malfunction, flame failure and/or improper air to gas ratios. If repairs cannot be made quickly, divert the NCG and SOG gas streams to the backup NCG combustion unit.<br>If the malfunction can not be corrected in a timely manner and the backup NCG combustion unit is not available for backup combustion, begin to shutdown the NCG vent gas process, collection, and transportation systems, when practicable. | <br>B<br>S, B<br>B |
| Kiln or Combination Boiler - NCG Combustion | Malfunctions<br>Flame Failure<br>Flame Safety System Non-Permissive<br>Emission Minimization Steps | S,B |

| Event | Malfunction and Emissions Minimization Steps | Operational Effect[(Note 1)] |
|---|---|---|
| System failure | ▪ Divert the vent gases to backup ( Boiler or Kiln) | |
| Positive Pressure in Kiln Body | Malfunctions<br>Primary and secondary air fan failure<br>Induced draft fan failure<br>Emissions Minimization Steps<br>Take maintenance action to repair malfunction.<br>If the repair will take a prolonged length of time, divert the gases to the No. 4 Boiler, when practicable. | |
| Mechanical Component Failure | Malfunctions<br>Pump, Conveyer, or Impeller Failure<br>Kiln Lime Mud Delivery System Failure<br>Kiln Bucket Elevator System Failure<br>Emissions Minimization Steps<br>If the malfunction is at the vent gas source, isolate the problem by venting the source and repairing the source..<br>If the malfunction is at the Lime Kiln and repairs cannot be made quickly, divert the NCG and SOG gas streams to the No. 4 Boiler.<br>If the malfunction can not be corrected in a timely manner and the backup NCG Combustion unit is not available for backup combustion, begin to shutdown the stripper and vent gas process, collection, and transportation systems, as soon as practicable. | |
| Electrical Component Failure | Malfunctions<br>Instrument Loop Failure<br>Power Failure<br>Emissions Minimization Steps<br>If the malfunction is at the vent gas source, isolate the problem by venting the source, and then repair.<br>If the malfunction is in the Kiln NCG system, switch the gases to the No. 4 Boiler and evaluate the repairs necessary to correct the malfunction.<br>If the malfunction can not be corrected in a timely manner and the backup NCG Combustion unit is not available for backup combustion, begin to shutdown the stripper and vent gas process, collection, and transportation systems, as soon as practicable | <br>B, S<br>S |

**Note 1**

**"O"** indicates that the malfunction or device can be verified and corrected while the source is operational.

**"B"** indicates the malfunction or device can be verified and corrected while the source is operational, but the malfunctioning device must be bypassed and/or isolated.

**"S"** indicates that the malfunction cannot be verified or corrected while the system is operational. Such a malfunction will require a temporary shutdown to correct the malfunction. *For malfunctions that require a source to shutdown for repairs or maintenance, the shutdown must be done in a fashion not to create a more significant environmental incident than the temporary venting of pulping gases or sewering of pulping condensate. The mill should document these decisions in the following report.*

## NOTE: THE OPERATOR MUST COMPLETE THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE!

# NCG SYSTEM - SSM MALFUNCTION INCIDENT REPORT:

***WHAT WAS THE NATURE OF MALFUNCTION EVENT? _____***
***_____***

***WAS SSM CHECKLIST FOLLOWED FOR NCG SYSTEM MALFUNCTION*? ____***

***TIME THAT NCG SYSTEM VENTING DUE TO MALFUNCTION BEGAN: _____***

***TIME OF NCG SYSTEM MALFUNCTION REPAIR AND END OF VENTING:_____***

***WHAT WAS DONE TO CORRECT THE MALFUNCTION? _____***
***_____***
***_____***

***OPERATOR NAME: _____ DATE _____ TIME _____***

****IF THE SSM PLAN WAS NOT FOLLOWED DURING THE MALFUNCTION OF THE NCG SYSTEM, PLEASE EXPLAIN WHAT WAS DONE: _____***
***_____***

## 4.NON-CONDENSABLE GAS (NCG) COLLECTION/COMBUSTION SYSTEM DESCRIPTION & NCG SYSTEM FLOW DIAGRAM

EPA defines a *LVHC Collection System* as follows:

"*Low volume, high concentration* or *LVHC (NCG) collection system* means the non-condensable gas collection and transport system used to convey gases from the LVHC system to a control device."

The EPA defines a *LVHC System* as follows:

"*Low volume, high concentration* or *LVHC system* means the collection of equipment including the digester, turpentine recovery, evaporator, steam stripper systems, and any other equipment serving the same function as those previously listed."

The EPA defines a *Closed-Vent System* as follows:

"*Closed-vent system* means a system that is not open to the atmosphere and is composed of piping, ductwork, connections, and, if necessary, flow-inducing devices that transport gas or vapor from an emission point to a control device."

The Panama City Mill NCG *"Closed-vent" Collection System* includes the following process equipment: Gas Coolers, Mist Eliminators, Rupture discs, Steam Ejectors, Flame Arresters, and Flow Control Valves.

The Panama City Mill LVHC *"Closed Vent"* Non-condensable gas (NCG) collection system collects vent gases from the following process equipment: Batch Digester blow heat recovery system, Turpentine Recovery System, Evaporator System (includes hotwell vents), Foul Condensate Collection Tanks, and the Stripper system.

The LVHC NCG system is "de-coupled" from the process equipment, meaning that the collection system can continue to run even when the process equipment is down. Therefore, upsets that cause the process source equipment to go down do not necessarily cause the LVHC NCG system to vent or go down unless the process upset introduces liquor carryover or significant air infiltration into the vent gas collection system.

For purposes of the SSM plan, the startup, shutdown, and malfunction events are limited to those that affect the LVHC NCG "closed-vent" Collection system and the Combustion of NCG in the No. 4 Boiler or Lime Kiln directly.

The Lime Kiln system may include the following process equipment: Lime Mud Feed System, Induced Draft Fan, Kiln Body, Primary and Secondary Air Fans, Lime Exit Conveyor, and Exit Gas Scrubber. The Lime Kiln NCG combustion system consists of a concentrated NCG burner system and bypass valve and the flame safety system.

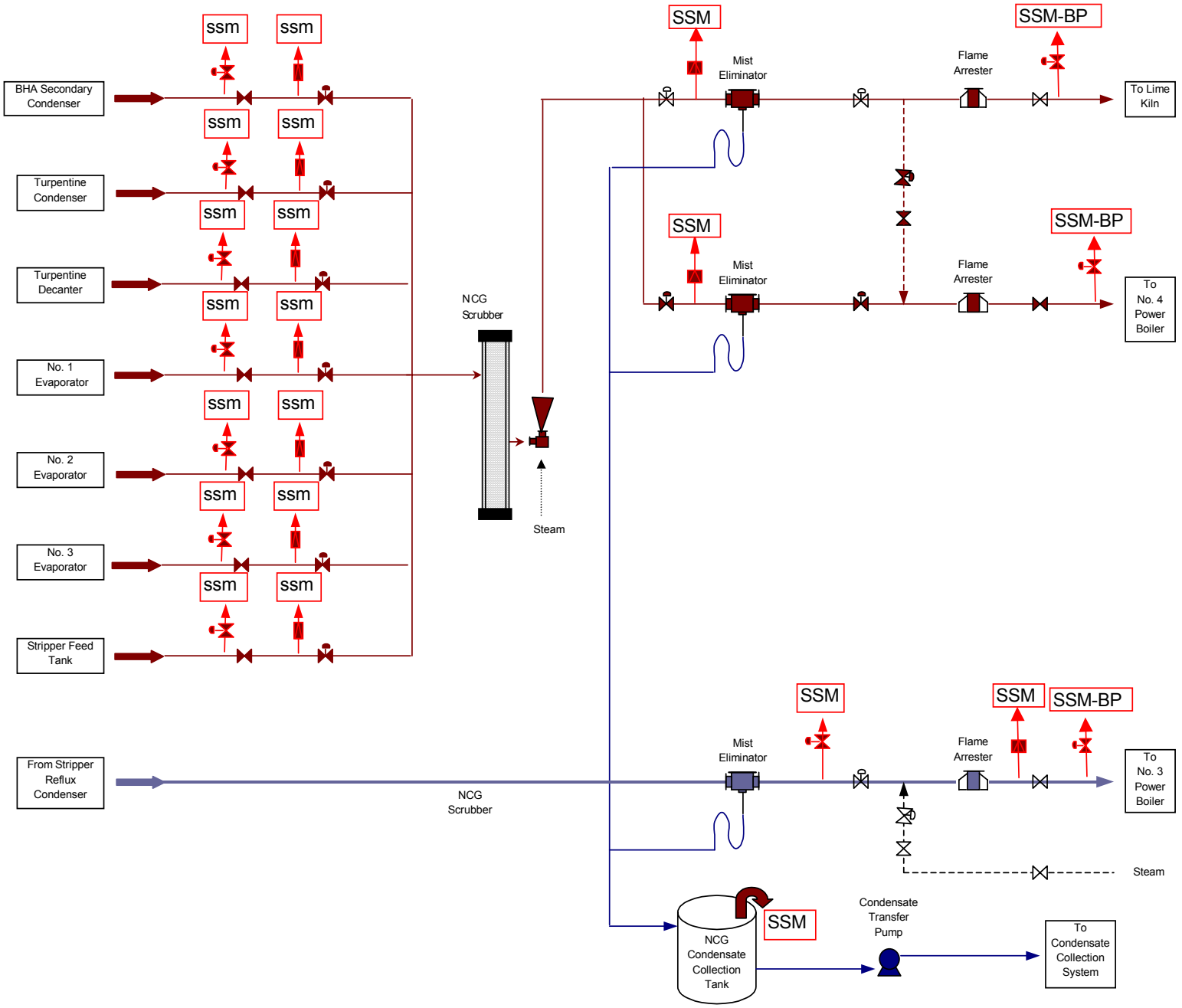
The No. 4 Boiler system may include the following process equipment: Induced Draft Fan, Combustion Air Fan, Oxidation Chamber, Bark Feed System, a Traveling grate, and oil burning equipment. The No. 4 Boiler NCG Combustion System consists of a concentrated NCG burner system, a NCG Bypass valve, and the flame safety system.

The Panama City Mill NCG COLLECTION/COMBUSTION system SSM plan is triggered by the following events:

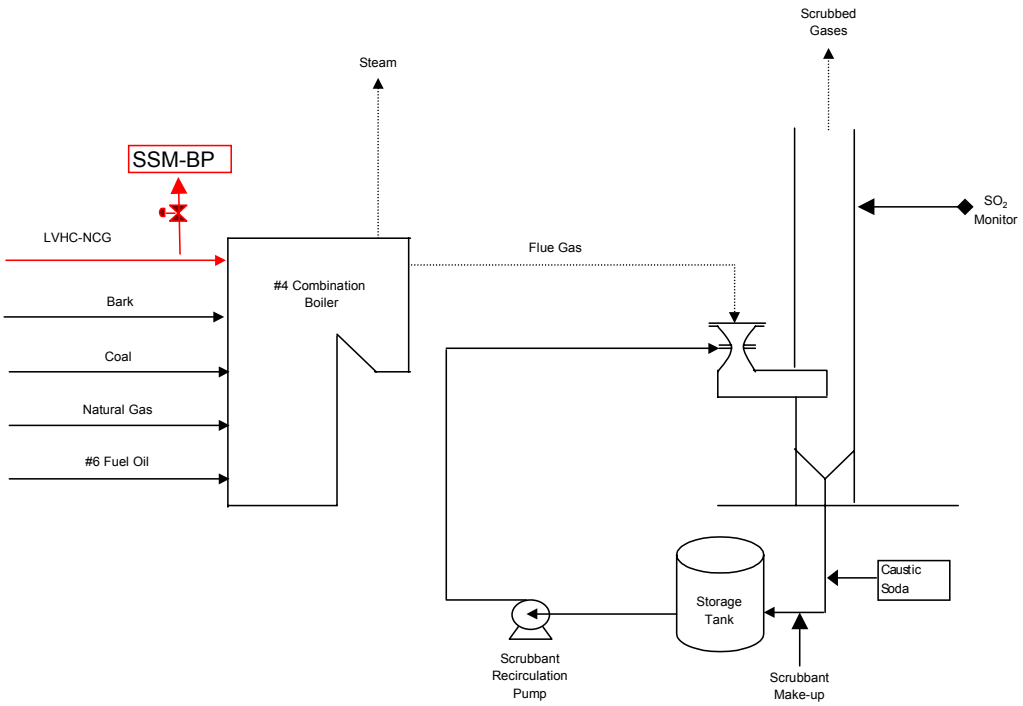
- **NCG COLLECTION SYSTEM STARTUP**
- **NCG COLLECTION SYSTEM SHUTDOWN**
- **NO. 4 POWER BOILER NCG BURNER SYSTEM BYPASS***
- **LIME KILN NCG BURNER SYSTEM BYPASS***
- **NCG COLLECTION SYSTEM Rupture Disk Failure**
- **1-A EVAPORATOR NCG SYSTEM Source Vent Valve Opening**
- **2 EVAPORATOR NCG SYSTEM Source Vent Valve Opening**
- **3 EVAPORATOR NCG SYSTEM Source Vent Valve Opening**
- **1-A EVAPORATOR NCG SYSTEM Rupture Disk Opening**
- **2 EVAPORATOR NCG SYSTEM Rupture Disk Opening**
- **3 EVAPORATOR NCG SYSTEM Rupture Disk Opening**
- **B.H. ACCUMULATOR 2$^{NDARY}$ CONDENSER NCG Vent Valve Opening**
- **B.H. ACCUMULATOR 2$^{NDARY}$ CONDENSER NCG Rupture Disk Opening**
- **TURPENTINE CONDENSER NCG SYSTEM Rupture Disk Opening**
- **TURPENTINE DECANTER NCG SYSTEM Source Vent Valve Opening**
- **TURPENTINE CONDENSER NCG SYSTEM Rupture Disk Opening**
- **TURPENTINE DECANTER NCG SYSTEM Source Vent Valve Opening**

*SSM EVENT ONLY WHEN THIS SOURCE IS THE LAST NCG COMBUSTION UNIT OPERATING

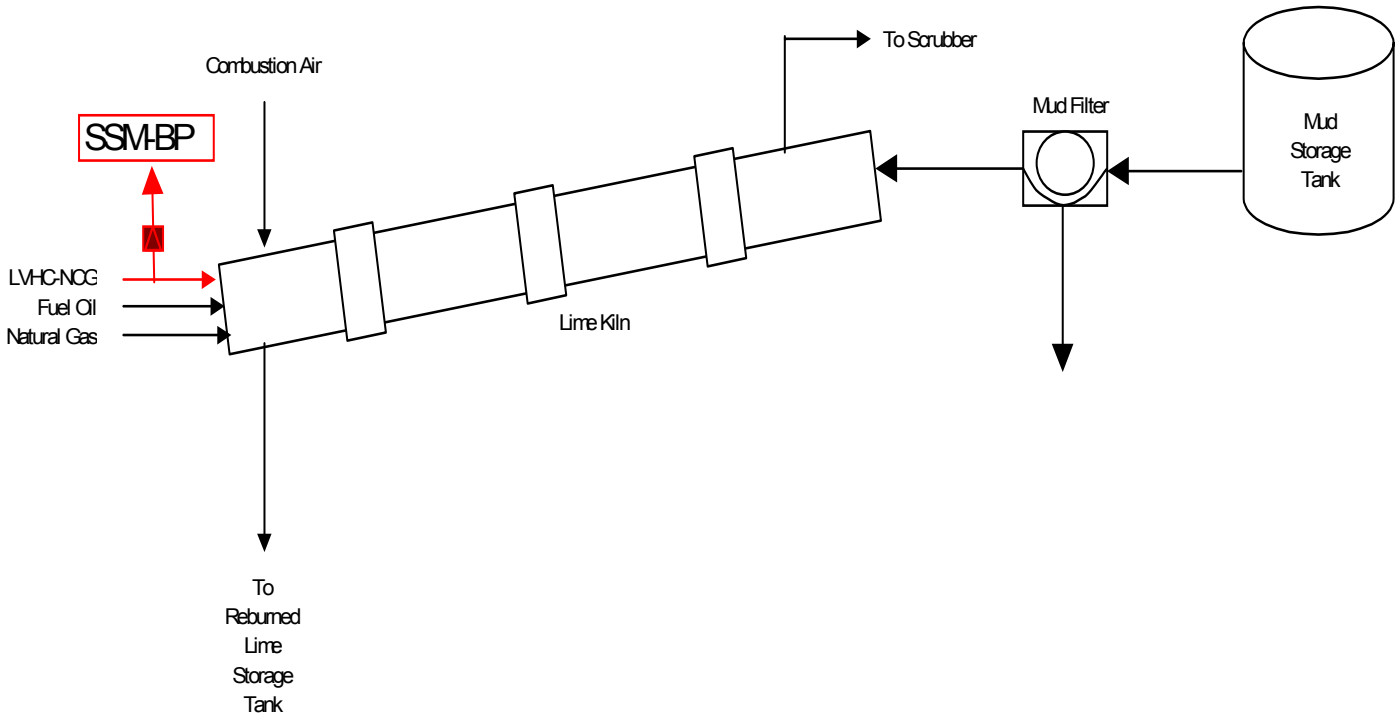
# Panama City Mill Process Flow Diagrams
# LVHC Collection and NCG/SOG Transportation System



# Panama City Mill Process Flow Diagram
# #4 Combination Boiler - LVHC-NCG Combustion



# Panama City Mill Process Flow Diagram
# Lime Kiln LVHC-NCG Combustion



# THE SSM PLAN FOR THE FOUL CONDENSATE COLLECTION SYSTEM HAS BEEN TRIGGERED!

## PLEASE SELECT THE APPROPRIATE SSM PLAN OR INFORMATION:

1. **CONDENSATE COLLECTION SYSTEM START-UP PLAN & REPORT FORMS**
2. **CONDENSATE COLLECTION SHUTDOWN PLAN & REPORT FORMS**
3. **CONDENSATE COLLECTION SYSTEM MALFUNCTION PLAN & REPORT FORMS**
4. **CONDENSATE COLLECTION SYSTEM DESCRIPTION & FLOW DIAGRAM**

## 1. CONDENSATE COLLECTION SYSTEM STARTUP EMISSIONS MINIMIZATION CHECKLIST

Startup Procedures
Below is the definition of the pulping condensate system startup for normal operations and a checklist for the minimization of emissions during the pulping condensate collection system startup period.

The Condensate collection startup period begins with the startup of the first digester or evaporator system and generation of regulated condensate from that source. The condensate collection system startup ends when all condensate, required for compliance, is collected and sent to the condensate treatment system.

Pre-Startup Checklist
The following conditions must be verified prior to collecting pulping condensate from the required pulping condensate sources.

- Have the conductivity diversion systems been verified and are set to automatically divert pulping condensates based on liquor contamination?
- Is there adequate storage volume in the seal pots or condensate storage tanks to allow collection of condensate during the startup period?
- Is the condensate treatment system operating and ready to accept collected pulping condensate?

Startup Emissions Minimization Checklist

- Insure that the level controls and conductivity control of pulping condensates are working properly and operational.
- Deliver the flow of pulping condensate to the treatment system.

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

# *CONDENSATE COLLECTION SSM STARTUP INCIDENT REPORT*

***TIME OF CONDENSATE COLLECTION STARTUP INITIATION:*** _____

***WAS THE SSM CHECKLIST FOLLOWED IN STARTUP OF THE CONDENSATE COLLECTION SYSTEM*?*** _____

***TIME THAT CONDENSATE COLLECTION SYSTEM STARTUP DIVERSION OR OVERFLOW BEGAN:*** _____

***TIME THAT CONDENSATE COLLECTION STARTUP DIVERSION OR OVERFLOW ENDED:*** _____

***TIME OF CONDENSATE COLLECTION STARTUP COMPLETION:*** _____

***OPERATOR NAME:*** _____ ***DATE:***_____ ***TIME:***_____

****IF THE SSM PLAN WAS NOT FOLLOWED IN STARTING THE CONDENSATE COLLECTION SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

## 2. CONDENSATE COLLECTION SYSTEM SHUTDOWN EMISSIONS MINIMIZATION CHECKLIST

Shutdown Procedures
Below is the definition of the transition from normal operations to shutdown and a checklist for the minimization of emissions during the pulping condensate system shutdown period.

***The pulping condensate collection system should be operational until all sources generating pulping condensate have been shutdown.***
The condensate collection system shutdown period is defined as the time between the shutdown of the first and last process source generating regulated condensate

Pre-Shutdown Checklist
The following conditions must be verified prior to stopping collection of pulping condensates from the digester Blow heat accumulator (and 1-A evaporator set if necessary) condensate collection system.

- Has the digester system and 1-A evaporator set been shutdown?
- Are all condensate streams diverted to the sewer?

Shutdown Emissions Minimization Checklist

- Shutdown all pumps and other pulping condensate collection equipment.

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

# ***CONDENSATE COLLECTION SSM SHUTDOWN INCIDENT REPORT:***

***WAS THE ABOVE CHECKLIST FOLLOWED IN SHUTDOWN OF THE CONDENSATE COLLECTION SYSTEM*?*** _____

***TIME OF FIRST PROCESS CONDENSATE SOURCE SHUTDOWN:*** _____

***TIME THAT CONDENSATE SYSTEM SHUTDOWN DIVERSION OR OVERFLOW TO SEWER STARTED:*** _____

***TIME THAT CONDENSATE SYSTEM SHUTDOWN DIVERSION OR OVERFLOW TO SEWER ENDED:*** _____

***TIME OF FINAL PROCESS CONDENSATE SOURCE SHUTDOWN:*** _____

***OPERATOR NAME:*** _____ ***DATE***_____ ***TIME***_____

****IF THE SSM PLAN WAS NOT FOLLOWED IN SHUTDOWN OF THE CONDENSATE COLLECTION SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

## 3. FOUL CONDENSATE COLLECTION SYSTEM MALFUNCTION EMISSIONS MINIMIZATION CHECKLIST

Below is a description of the various malfunctions and associated operational events for the pulping condensate system with the corresponding emissions minimization information. These malfunctions and events include such issues as safety interlocks, process alarms, and equipment failures. ***Note: diverting pulping condensate to the sewer would only be an excess emission if the duration of the diversion were long enough to reduce the amount of pulping condensate treated to below the standard of methanol per ton required. The mill is still required to monitor and report such diversions.***

| **Events** | **Malfunctions and Emissions Minimization Steps** | **Operational Effect** (Note1) |
|---|---|---|
| Condensate Liquor Contamination | Malfunctions<br>Digester Cyclone Failure<br>Excessive Simultaneous Digester Blows<br>High Blow Tank Level<br>Evaporator Liquor Carryover<br>Emissions Minimization Steps<br>Identify the nature and extent of the liquor contamination.<br>Divert the individual condensate to the sewer until conductivity is within acceptable range.<br>Restore collection and treatment of this condensate as soon as practicable. | <br>S<br>O<br><br>O |
| Condensate Turpentine Contamination | Malfunctions<br>Condenser failure<br>Condenser bypass<br>Emissions Minimization Steps<br>As the decanter underflow is directed to the Blow Heat Accumulator it is unlikely that condensate turpentine contamination or emulsion will get to the stripper. In the unlikely event that this occurs, divert the minimum amount of pulping condensate to the sewer.<br>Restore collection and treatment of this condensate as soon as practicable. | <br>S<br>B, S |

| **Events** | **Malfunctions and Emissions Minimization Steps** | **Operational Effect** (Note1) |
|---|---|---|
| Condensate Treatment System Malfunction | Malfunctions<br>Stripper Malfunction<br>SOG Collection System Malfunction<br>No. 3 SOG burner Malfunction<br>Emissions Minimization Steps<br>The stripper should be bottled-up or shutdown immediately.<br>While the stripper is bottled-up, continue to collect condensate and determine the cause of the Condensate treatment system malfunction. Evaluate the repairs necessary to correct the malfunction. If the malfunction can not be corrected in timely manner, begin to shutdown the stripper and SOG combustion process, as soon as practicable | |
| Mechanical Failure | Malfunctions<br>Pump Failure<br>Valve Failure<br>Emissions Minimization Steps<br>Determine the cause of the mechanical failure and repair as soon as possible. Keep the decanter underflow going to the accumulator and divert the underflow to the sewer only as a last resort.<br>Restore collection and treatment of this condensate as soon as practicable. | |
| Electrical Failure | Malfunctions<br>Instrument Loop Failure<br>Power Outage<br>Motor Failure<br>Emissions Minimization Steps<br>Determine the cause of the electrical failure and repair as soon as possible. Keep the decanter underflow going to the accumulator and divert the underflow to the sewer only as a last resort. | <br>O, S<br>S<br>B, S |

| Events | Malfunctions and Emissions Minimization Steps | Operational Effect (Note1) |
|---|---|---|
| | Restore collection and treatment of this condensate as soon as practicable. | |

**Note 1:**

**"O"** indicates that the malfunction or device can be verified and corrected while the source is operational.

**"B"** indicates the malfunction or device can be verified and corrected while the source is operational, but the malfunctioning device must be bypassed and/or isolated.

**"S"** indicates that the malfunction cannot be verified or corrected while the system is operational. Such a malfunction will require a temporary shutdown to correct the malfunction.

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

# FOUL CONDENSATE COLLECTION SYSTEM - SSM MALFUNCTION INCIDENT REPORT:

***WHAT WAS THE NATURE OF MALFUNCTION EVENT?*** _____
_____

***WAS SSM CHECKLIST FOLLOWED FOR SYSTEM MALFUNCTION*?*** _____

***TIME CONDENSATE DIVERSION TO THE SEWER BEGAN:*** _____

***TIME CONDENSATE DIVERSION TO THE SEWER ENDED:*** _____

***WHAT WAS DONE TO CORRECT THE MALFUNCTION?*** _____
_____

***OPERATOR NAME:*** _____ ***DATE:***_____ ***TIME:***_____

****IF THE SSM PLAN WAS NOT FOLLOWED DURING THE MALFUNCTION OF THE CONDENSATE COLLECTION SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***

_____
_____

## 4. FOUL CONDENSATE COLLECTION SYSTEM DESCRIPTION & SYSTEM FLOW DIAGRAM

The EPA defines a ***Pulping System*** as follows:

"*Pulping system* means all process equipment, beginning with the digester system, and up to and including the last piece of pulp conditioning equipment prior to the bleaching system, including treatment with ozone, oxygen, or peroxide before the first application of a chemical bleaching agent intended to brighten pulp. The pulping system includes pulping process condensates and can include multiple pulping lines."

The EPA defines a ***Pulping Process Condensate*** as follows:

"*Pulping process condensate* means any HAP-containing liquid that results from contact of water with organic compounds in the pulping process. Examples of process condensates include digester system condensates, turpentine recovery system condensates, evaporator system condensates, LVHC system condensates, and any other condensates from equipment serving the same functions as those previously listed. Liquid streams that are intended for byproduct recovery are not considered process condensate streams."

The Pulping Condensate collection system may include the following process equipment: Seal Pots, Storage Tank(s), Pumps, Conductivity Meters, and Diverting or Flow Control Valves. The pulping condensates are usually collected from the process source areas via condensate tanks or standpipes. These condensates are then pumped to a main collection or feed tank that feeds the stripper. All foul condensate tanks are vented to the LVHC gas collection system.

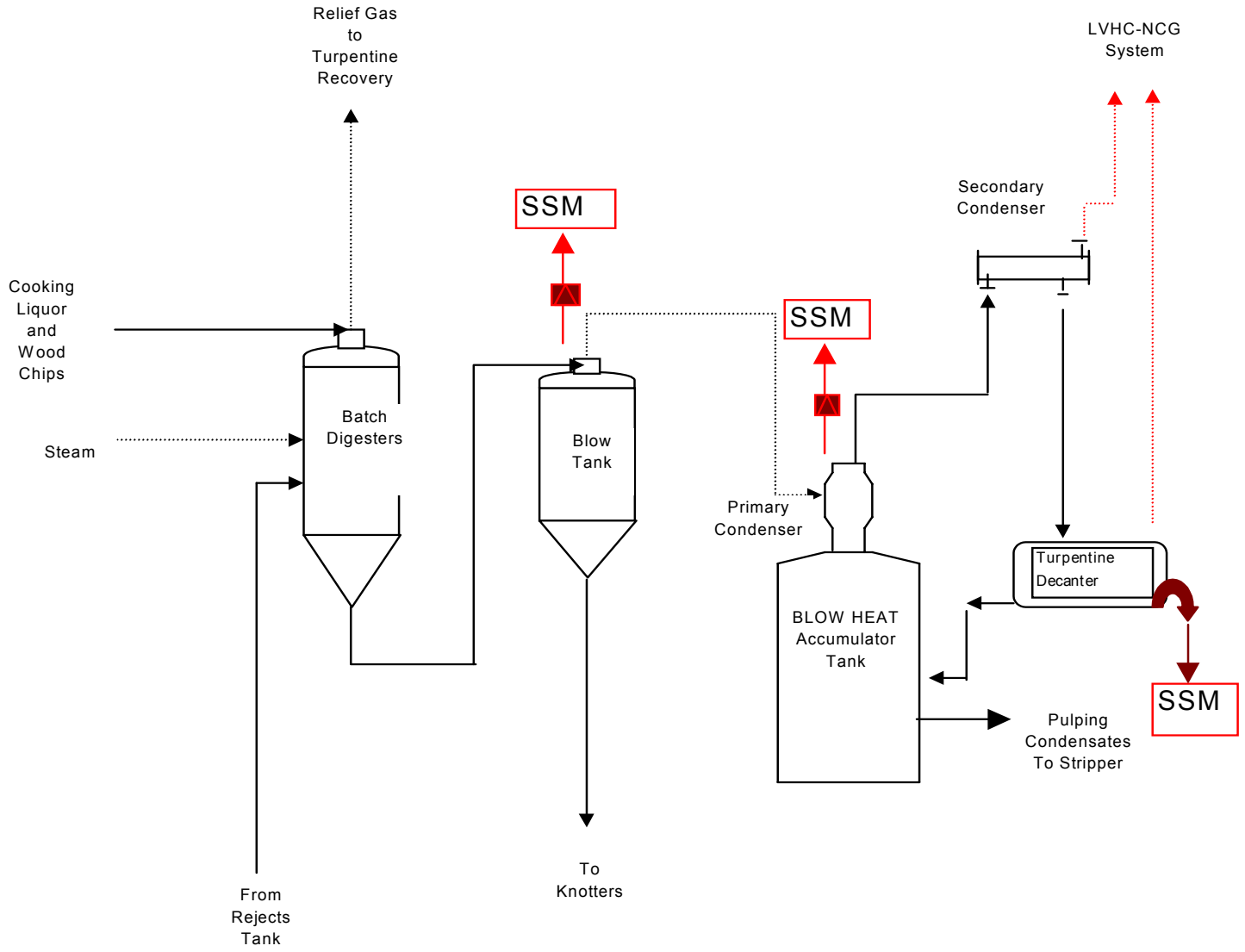
The Panama City "Foul" Pulping Condensate collection system collects from the Blow Heat Accumulator Overflow and segregated foul condensate from the A-1 Evaporator set.

**The Condensate Collection System SSM Plan is triggered by:**

- **FOUL CONDENSATE COLLECTION SYSTEM STARTUP**
- **FOUL CONDENSATE COLLECTION SYSTEM SHUTDOWN**
- **FOUL CONDENSATE SYSTEM 1-A Evaporator Hotwell Overflow***
- **FOUL CONDENSATE SYSTEM Turpentine Decanter Overflow**

*** Only if collection of this condensate is required (during periods when Bleached Hardwood Pulp is not being produced)**

# Panama City Mill Process Flow Diagram
# Batch Digester System



**THE SSM PLAN FOR THE**
**FOUL CONDENSATE TREATMENT SYSTEM**
**(CONDENSATE STRIPPER AND NO. 3 BOILER SOG BURNER)**
**HAS BEEN TRIGGERED!**

**PLEASE SELECT THE APPROPRIATE SSM PLAN OR INFORMATION:**

1. **CONDENSATE TREATMENT SYSTEM START-UP PLAN & REPORT FORMS**
2. **CONDENSATE TREATMENT SYSTEM SHUTDOWN PLAN & REPORT FORMS**
3. **CONDENSATE TREATMENT SYSTEM MALFUNCTION PLAN & REPORT FORMS**
4. **CONDENSATE TREATMENT SYSTEM DESCRIPTION & FLOW DIAGRAM**

# 1. CONDENSATE TREATMENT SYSTEM STARTUP EMISSIONS MINIMIZATION CHECKLIST

Below is the definition of the system startup and a checklist for the minimization of emissions during the condensate stripping and SOG combustion system startup period. This startup checklist does not include any guidance regarding the startup of digester or evaporator systems that generate this condensate.

The stripper and SOG combustion unit should be operational prior to introduction of condensate to the stripper. The period of time defining the startup of the condensate stripping and combustion system is as follows: the startup of the Condensate Treatment system begins with the startup (introduction of water or condensate) to the stripper. The startup of the condensate stripping and combustion system ends with a stable level in the stripper feed tank, compliant stripping of the condensate, and combustion of the full stripper overhead gas (SOG) stream in the No. 3 Power Boiler.

Pre-Startup Checklist

The following conditions should be verified prior to introducing pulping condensate to the stripper and SOG combustion unit.

- ❑ Have the conductivity diversion systems been verify and are set to automatically divert pulping condensate based on liquor or turpentine contamination?
- ❑ Is there adequate storage volume in the seal pots or condensate storage tanks or stripper feed tank to allow collection of condensate during the startup period?
- ❑ Is the Stripper system running and operating within the liquid to effective steam ratio required for methanol removal?
- ❑ Are all stripper process temperatures, pressures and flows at normal operating conditions?
- ❑ Is the SOG combustion unit (No. 3 Power Boiler) operating and in “READY” mode to accept stripper gases, have the flame safety permissives been met, and is air or steam flowing to the SOG injection nozzle?
- ❑ Is the stripper monitoring system calibrated and operational?

Startup Emissions Minimization Checklist

- ❑ The No. 3 Boiler should be allowed to reach a normal operating state before switching the stripper vent gases over.
- ❑ Insure that the level controls and conductivity control of pulping condensate systems are working properly and operational.
- ❑ Introduce the flow of pulping condensate to the stripper and add the SOG gas stream to the No. 3 Boiler SOG burner system.

## NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!

# ***CONDENSATE TREATMENT SYSTEM SSM STARTUP INCIDENT REPORT:***

***WAS THE SSM PLAN CHECKLIST FOLLOWED IN STARTUP OF THE CONDENSATE STRIPPING AND COMBUSTION SYSTEM*?*** _____

***TIME THAT CONDENSATE SYSTEM STARTUP BEGAN:*** _____

***TIME THAT STRIPPER FEED TANK SPILLED OR DIVERSION TO SEWER BEGAN:*** _____

***TIME THAT STRIPPER FEED TANK SPILL OR DIVERSION TO SEWER STOPPED:*** _____

***TIME THAT STRIPPER OVERHEAD GAS VENTING BEGAN:*** _____

***TIME THAT STRIPPER OVERHEAD GAS VENTING ENDED:*** _____

***TIME THAT CONDENSATE SYSTEM STARTUP ENDED, STRIPPER OPERATING NORMALLY AND SOG BURNING:*** _____

***OPERATOR NAME:*** _____ ***DATE:*** _____ ***TIME:*** _____

****IF THE SSM PLAN WAS NOT FOLLOWED IN STARTING THE CONDENSATE STRIPPING AND SOG COMBUSTION SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

# 1. CONDENSATE TREATMENT SYSTEM SHUTDOWN - EMISSIONS MINIMIZATION CHECKLIST

Below is the Condensate Treatment System checklist for the minimization of emissions during the system shutdown period of the system. There is no requirement to cease generating condensate and stop process source operation unless the condensate collection or treatment standard of methanol per ton of pulp is in question. From time to time the Stripper and SOG system must be shutdown for preventive or regular maintenance while continuing to operate pulping and evaporator processes. This maintenance downtime is specifically allowed for in the Cluster Rule but limited, in that the condensate must be successfully treated more than 90% of the time on a six-month basis. ***Furthermore, diverting pulping condensate to the sewer would only be an excess emission if the duration of the diversion were long enough to reduce the amount of pulping condensate collected to below the standard of methanol per ton required. The mill is still required to monitor and report such diversions and the pulping condensate collection system <u>should</u> be operational unless all sources generating pulping condensate have been shutdown.***

<u>Pre-Shutdown Checklist</u>

- The following conditions should be verified prior to suspending treatment of the pulping condensate from the pulping condensate collection system.
- Are all condensate streams still being collected?
- Has a short-term or long-term condensate treatment system plan been decided?
- If the shutdown period will be short, then bottle-up the stripper by stopping the stripper feed condensate and steam.

<u>Shutdown Emissions Minimization Checklist</u>

- The destruction of SOG should continue until the stripper and SOG transportation systems have been shutdown or when the temperature measured in the combustion zone of the SOG combustion unit falls below the minimum temperature requirement.
- Proceed to shut down the stripper.
- Maintain SOG flow to the No. 3 Boiler for as long as possible before switching to the safety vent, during the Stripper shutdown period.
- When shutting the SOG combustion system down, purge the SOG firing systems with steam prior to shutdown.
- Shutdown all SOG collection system equipment, such as steam ejectors and coolers, and purge the SOG collection system with steam.

## NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!

# ***CONDENSATE TREATMENT SYSTEM SSM SHUTDOWN INCIDENT REPORT:***

***WAS THE ABOVE CHECKLIST FOLLOWED IN SHUTDOWN OF THE CONDENSATE STRIPPING SYSTEM*?*** ____

***TIME THAT CONDENSATE TREATMENT SYSTEM SHUTDOWN BEGAN:_____***

***TIME THAT STRIPPING SYSTEM STRIPPER FEED TANK SPILL OR DIVERSION TO SEWER BEGAN:*** _____

***TIME THAT STRIPPING SYSTEM STRIPPER FEED TANK SPILL OR DIVERSION TO SEWER STOPPED:*** _____

***TIME THAT STRIPPER OVERHEAD GAS VENTING BEGAN:*** _____

***TIME THAT STRIPPER OVERHEAD GAS VENTING ENDED:*** _____

***TIME THAT CONDENSATE TREATMENT SYSTEM SHUTDOWN ENDED:_____***

***OPERATOR NAME:*** _____ ***DATE:***_____ ***TIME:***_____

****IF THE SSM PLAN WAS NOT FOLLOWED IN SHUTDOWN OF THE CONDENSATE STRIPPER SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

## 3.CONDENSATE TREATMENT SYSTEM MALFUNCTION - EMISSIONS MINIMIZATION CHECKLIST

Below is a description of the various malfunctions and associated operational events for the condensate stripping system with the corresponding emissions minimization information. These malfunctions and events include such issues as safety interlocks, process alarms, and equipment failures. The malfunctions listed are those that would likely cause excess emissions of either pulping vent gases or pulping condensate. During malfunctions that would result in stripper shutdown, the pulping condensate should continue to be collected during the stripper outage. Once, condensate collection storage is exhausted, the mill should consider shutdown of sources generating pulping condensate or diversion of individual condensate streams that would minimize emissions, as practicable, in compliance with condensate collection and treatment requirements.

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| Rupture Disc Failure | Malfunctions<br>Over Pressurization<br>Emissions minimization steps<br>Bottle-up the Stripper, isolate the rupture disc and replace as soon as practicable.<br>Investigate the cause of over pressurization and correct any operational problems. | O, B |
| Loss of Steam Pressure or Stripper Steam to Condensate ratio monitor exceedance | Malfunctions<br>Low Steam Header Pressure<br>Steam Hammering<br>Stripper "Effective" Steam less than set point<br>Emissions Minimization Steps<br>Determine the extent of the loss of steam pressure immediately.<br>If the steam pressure can be restored in a timely fashion, reduce condensate flow to the "effective" Steam to Condensate ratio and then resume normal operations of the stripper system as soon as normal steam flow returns.<br>If the malfunction will require an extended time to correct, begin to shutdown the Stripper and SOG systems in a deliberate manner, as soon as practicable. | B, S |

Description of Malfunctions (continued)

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| Stripper Monitoring Instrument Failure | Malfunctions<br>Stripper feed condensate temperature probe failure<br>Stripped condensate temperature probe failure<br>Steam Flow meter malfunction<br>Condensate Flow meter malfunction<br>Emissions Minimization Steps<br>If the probe or meter can be restored in a timely fashion, reduce condensate flow to the best estimate of the "effective" Steam/Condensate ratio and then resume normal operations of the stripper system as soon as the instrument is repaired.<br>If the malfunction will require an extended time to correct, begin to shutdown the Stripper and SOG systems in a deliberate manner, when practicable. | |
| Process Malfunction | Malfunctions<br>Condensate Contamination (Fiber, Liquor, Turpentine)<br>Emissions Minimization Steps<br>As soon as it is known that the condensate in the stripper feed tank is contaminated, the stripper should be shut down immediately. The condensate flow from the source of the contamination should be stopped and the condensate collection line from that source purged Empty the stripper feed tank. Restart the stripper as soon as clean condensate can be again collected. | S |
| Combustion Unit (No. 3 Boiler) - Flame Failure or Low Temperature or Temperature Monitor Malfunction | Malfunctions<br>Temperature Probe Failure<br>Flame failure<br>Improper air to gas ratio<br>Emissions Minimization Steps<br>Investigate the cause of the low temperature: temperature probe malfunction, flame failure and/or improper air to gas ratios. If repairs cannot be made quickly, begin to shutdown the stripper and SOG collection and transportation system as soon as practicable. | <br>B<br>S, B<br>B |
| No. 3 Boiler Scrubber Malfunction | Malfunctions<br>Caustic/water supply or recirculation pump failure<br>Liquid level controller failure<br>Emissions Minimization Steps<br>Continue to scrub the vent gases to the extent possible during malfunction (this may include manual adjustment of pH or scrubbant liquid). | O,S |

Description of Malfunctions (continued)

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| Mechanical Component Failure | Malfunctions<br>Pump, Conveyer, or Impeller Failure<br>Heat Exchanger Pluggage<br>Kiln Lime Mud Delivery System Failure<br>Kiln Bucket Elevator System Failure<br>Emissions Minimization Steps<br>If the malfunction is at the stripper, shutdown and repair the stripper. If the malfunction is at the No. 3 Boiler or SOG burner, begin to shutdown the stripper and SOG collection and transportation system as soon as practicable. | |
| Electrical Component Failure | Malfunctions<br>Instrument Loop Failure<br>Power Failure<br>Emissions Minimization Steps<br>If the malfunction is at the stripper, shutdown and repair the stripper. If the malfunction is at the No. 3 Boiler or SOG burner, begin to shutdown the stripper and SOG collection and transportation system as soon as practicable. | <br>B, S<br>S |

**Note 1**

**"O"** indicates that the malfunction or device can be verified and corrected while the source is operational.

**"B"** indicates the malfunction or device can be verified and corrected while the source is operational, but the malfunctioning device must be bypassed and/or isolated.

**"S"** indicates that the malfunction cannot be verified or corrected while the system is operational. Such a malfunction will require a temporary shutdown to correct the malfunction.

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

# CONDENSATE TREATMENT SYSTEM - SSM MALFUNCTION INCIDENT REPORT:

***WHAT WAS THE NATURE OF MALFUNCTION EVENT?*** _____

_____

***WAS SSM CHECKLIST FOLLOWED FOR SYSTEM MALFUNCTION*?*** _____

***TIME OF STRIPPER MONITORING SYSTEM MALFUNCTION OR STRIPPER FEED TANK DIVERSION TO SEWER:*** _____

***TIME THAT STRIPPER MONITORING SYSTEM FIXED OR STRIPPER FEED TANK SPILL OR DIVERSION TO SEWER STOPPED:*** _____

***TIME THAT STRIPPER OVERHEAD GAS VENTING BEGAN:*** _____

***TIME THAT STRIPPER OVERHEAD GAS VENTING ENDED:*** _____

***WHAT WAS DONE TO CORRECT THE MALFUNCTION?*** _____

_____

_____

***OPERATOR NAME:*** _____ ***DATE:*** _____ ***TIME:*** _____

****IF THE SSM PLAN WAS NOT FOLLOWED DURING THE MALFUNCTION OF THE CONDENSATE STRIPPING SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

## 4. CONDENSATE TREATMENT SYSTEM DESCRIPTION & *SYSTEM FLOW DIAGRAM*

The EPA defines a ***Steam Stripper System*** as follows:
"*Steam stripper system* means a column (including associated stripper feed tanks, condensers, or heat exchangers) used to remove compounds from wastewater or condensate using steam. The steam stripper system also contains all equipment associated with a methanol rectification process including rectifiers, condensers, decanters, storage tanks, and any other equipment serving the same function as those previously listed."

The Stripper system processes the foul condensate by use of indirect heating or direct steam injection to volatilize methanol and other hazardous air pollutants (HAPS). The Stripper off-gas (SOG), rich in methanol, is then sent on to the No. 3 Boiler SOG burner for HAPS destruction.

For purposes of the SSM plan, the startup, shutdown, and malfunction events are limited to those that affect the stripper, the SOG "closed-vent" Collection system and the combustion of NCG in the No. 3 Boiler, directly.

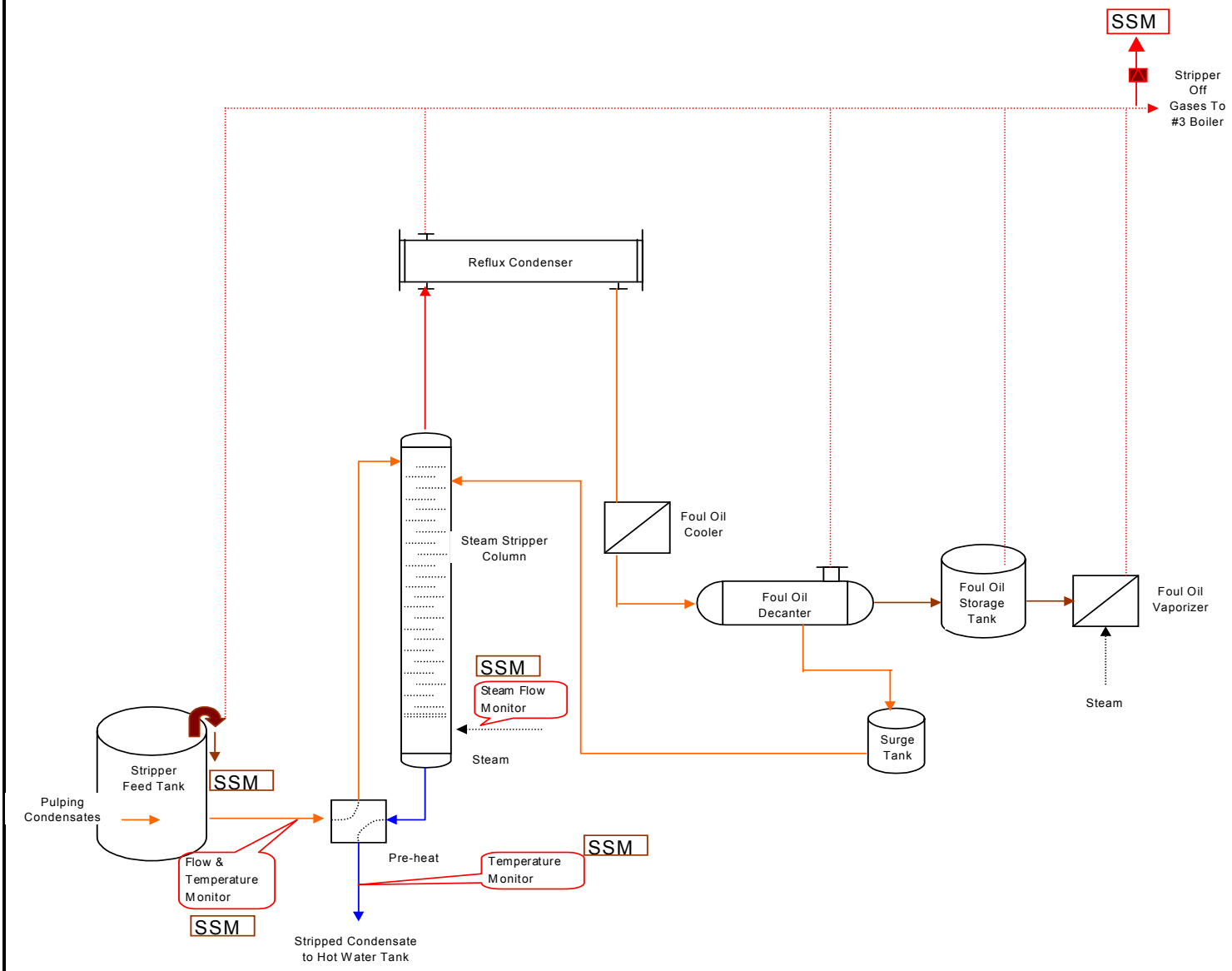
The No. 3 Boiler system may include the following process equipment: Induced Draft Fan, Combustion Air Fan, Oxidation Chamber, Bark Feed System, Coal feeder system, a Traveling grate, and oil burning equipment. The No. 3 Boiler SOG Combustion System consists of an SOG burner system, a SOG Bypass valve, and the boiler flame safety system.

The Cluster Rule requires that a minimum of 92% of the hazardous air pollutant, Methanol, must be removed by the stripper more than 90% of the time on a semi-annual basis. Compliance with the 92% methanol removal requirements must be continuously monitored. Stripper steam flow, stripper feed condensate temperature, stripped condensate temperature, and stripper condensate flow must be continuously monitored. The stripper SSM malfunction plan is triggered if any of the stripper monitoring systems fail.

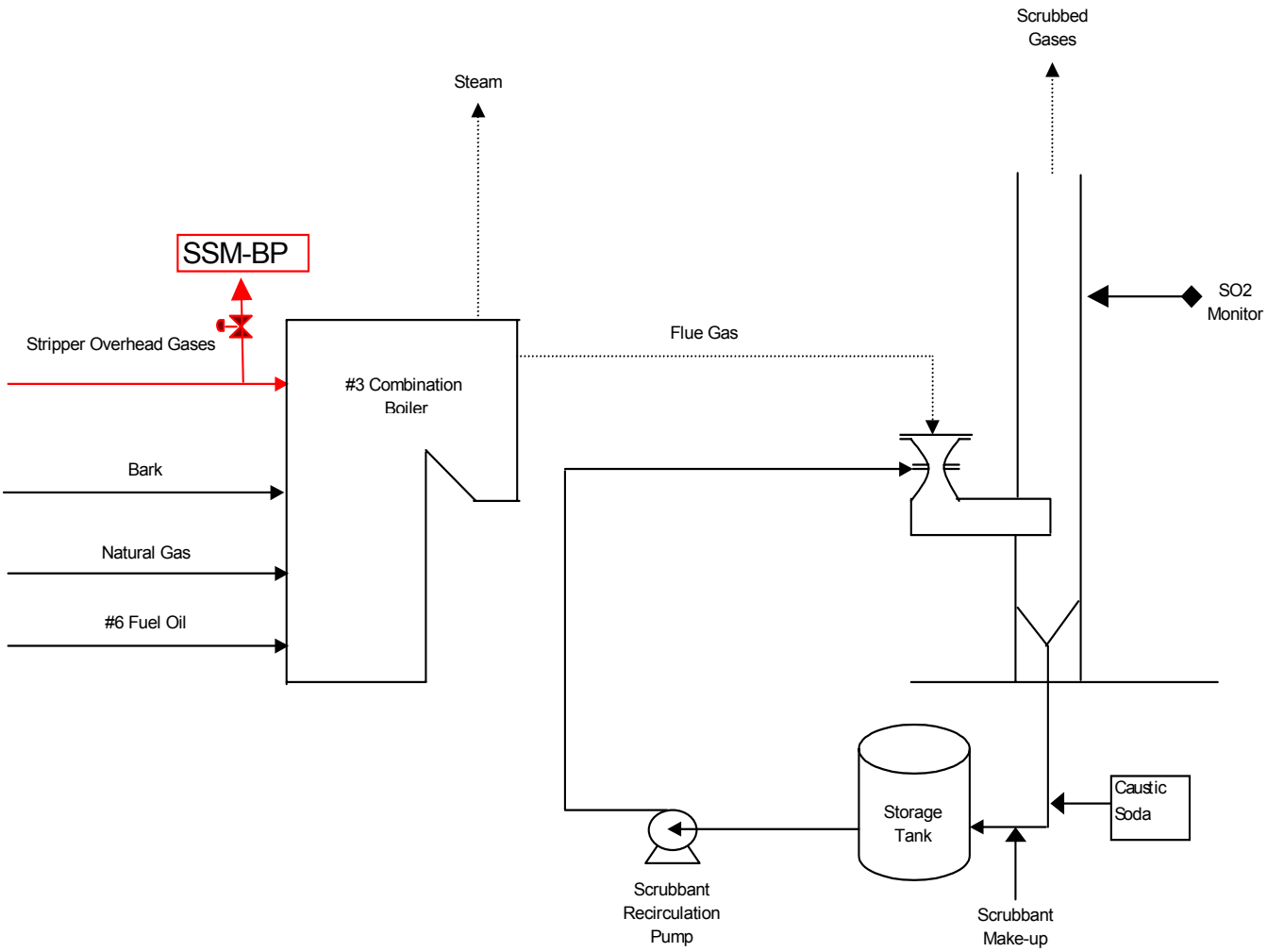
The foul Condensate Steam Stripper and SOG Combustion System SSM plan is triggered by:

- **STRIPPER and NO 3 BOILER SOG COMBUSTION SYSTEM STARTUP**
  **STRIPPER and NO. 3 BOILER SOG COMBUSTION SYSTEM SHUTDOWN**
- **No. 3 POWER BOILER Stripper Off-Gas Combustion System Bypass**
- **STRIPPER SYSTEM Feed Tank Overflow**
- **STRIPPER OFF GAS (SOG) Rupture Disk Failure**
- **STRIPPER SYSTEM Steam-to-Condensate Ratio Imbalance**
- **STRIPPER SYSTEM Steam flow Monitor Failure**
- **STRIPPER SYSTEM Condensate flow Monitor Failure**
- **STRIPPER SYSTEM Condensate feed temperature Monitor Failure**
- **STRIPPER SYSTEM Stripped Condensate temperature Monitor Failure**

# Panama City Mill Process Flow Diagram
## Steam Stripper



# Panama City Mill Process Flow Diagram
# #3 Combination Boiler - Stripper Overhead Gas Combustion



**THE SSM PLAN FOR THE BATCH DIGESTER SYSTEM HAS BEEN TRIGGERED!**

**PLEASE SELECT THE APPROPRIATE SSM PLAN OR INFORMATION:**

1. **BATCH DIGESTER SYSTEM START-UP PLAN & REPORT FORMS**

2. **BATCH DIGESTER SYSTEM SHUTDOWN PLAN & REPORT FORMS**

3. **BATCH DIGESTER SYSTEM MALFUNCTION PLAN & REPORT FORMS**

**4. BATCH DIGESTER SYSTEM DESCRIPTION & FLOW DIAGRAM**

# 1. BATCH DIGESTER SYSTEM STARTUP EMISSIONS MINIMIZATION CHECKLIST

Below is the definition of the Batch Digester system startup for normal operations and a checklist for the minimization of emissions during the Batch Digester system startup period. The proper sequence for startup is as follows: first startup of the control system, followed by startup of the collection and transportation system, and finally startup of the process equipment that is the source of vent gases or pulping condensate.

The Batch Digester system startup is initiated by the filling of a batch digester, and the startup period ends when the blow heat accumulator has reached stable operating temperature. “Holding” of digesters is defined as ceasing the steaming and blowing of digesters. The Batch Digester System is considered to be “down” when all previously loaded and steamed digesters are transferred to a “hold” status. The Batch System is considered to transition from a “down” to a “run” mode when the steaming or blowing of previously “held” digesters is resumed.

Pre-Startup Checklist

The following conditions should be verified prior to collecting vent gases and pulping condensate from the batch digester system.

- Are the control systems for vent gases and pulping condensate operating and ready to accept these streams?
- Is there a water inventory in the accumulator?
- Is the cooling water system operational for the indirect condensers and the turpentine condensers?
- Are the accumulator condensers operational?
- Is the accumulator pressure/vacuum breaker closed?
- Is the Blow Tank steam padding system on and stable?
- Is the Blow Heat Accumulator NCG vent open to allow air evacuation during initial Blow Tank steam padding?
- Are the condensate conductivity diversion systems operating?

Startup Emissions Minimization Checklist

- Check for proper water seal levels and flows. Verify all pressure and vacuum seals.
- Verify that the blow heat accumulator and turpentine recovery systems are operating within normal ranges for such process conditions as temperature, pressure, flow, and conductivity.
- It may take 4 to 6 blows to bring the blow tank and accumulator up to operating temperature. Until the operating temperature is achieved, the blow gas system may vent to atmosphere.

Begin to add the LVHC NCG vent gases and pulping condensate to the appropriate collection systems as soon as practicable during the startup period.

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

# ***SSM STARTUP INCIDENT REPORT:***

***TIME DIGESTER SYSTEM STARTUP PERIOD WAS STARTED:*** _____

***WAS THE SSM CHECKLIST FOLLOWED IN STARTUP OF THE BATCH DIGESTER SYSTEM*?*** _____

***TIME THAT VENTING FROM THE DIGESTER/TURPENTINE SYSTEM BEGAN:*** _____

***TIME THAT VENTING FROM THE DIGESTER/TURPENTINE SYSTEM CEASED:*** _____

***TIME THAT DIGESTER/TURPENTINE SYSTEM CONDENSATE OVERFLOW/DIVERSION BEGAN:*** _____

***TIME THAT DIGESTER/TURPENTINE SYSTEM CONDENSATE OVERFLOW/DIVERSION ENDED:*** _____

***TIME DIGESTER SYSTEM STARTUP COMPLETED:*** _____

***OPERATOR NAME:*** _____ ***DATE:*** _____ ***TIME:*** _____

****IF THE SSM PLAN WAS NOT FOLLOWED IN STARTUP OF THE BATCH DIGESTER SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

## 2. BATCH DIGESTER SYSTEM SHUTDOWN EMISSIONS MINIMIZATION CHECKLIST

Shutdown Procedures

Below is the definition of the transition from normal operations to shutdown and a checklist for the minimization of emissions during the batch digester system shutdown period. The proper sequence of shutdown is the source, followed by the collection and transportation system, and finally the control system. "Holding" of digesters is defined as ceasing the steaming and blowing of digesters. The Batch Digester System is considered to be "down" when all previously loaded and steamed digesters are transferred to a "hold" status. The Batch System is considered to transition from a "down" to a "run" mode when the steaming or blowing of previously "held" digesters is resumed.

Pre- Shutdown Checklists

The following conditions should be verified prior to not collecting vent gases and pulping condensate from the batch digester system.

- ❑ Verify that all digesters are blown empty or in hold status prior to shutdown.

Shutdown Emissions Minimization Checklist

- ❑ Shutdown the batch digester system or hold the digester system prior to shutting down the collection systems for LVHC NCG vent gases and pulping condensate.

*Note: It is possible to shutdown the batch digester system for a short time without causing excess emissions if the blow tanks are properly padded with steam and air is not allowed into the blow tanks or accumulator. If excess emissions do not occur, implementation of the SSM plan is not required.*

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

# ***SSM SHUTDOWN INCIDENT REPORT:***

***TIME DIGESTER SYSTEM SHUTDOWN PERIOD WAS STARTED:*** _____

***WAS THE SSM CHECKLIST FOLLOWED IN SHUTDOWN OF THE BATCH DIGESTER SYSTEM*?*** _____

***TIME THAT VENTING FROM THE DIGESTER/TURPENTINE SYSTEM BEGAN:*** _____

***TIME THAT VENTING FROM THE DIGESTER/TURPENTINE SYSTEM CEASED:*** _____

***TIME THAT DIGESTER/TURPENTINE SYSTEM CONDENSATE OVERFLOW/DIVERSION BEGAN:*** _____

***TIME THAT DIGESTER/TURPENTINE SYSTEM CONDENSATE OVERFLOW/DIVERSION ENDED:*** _____

***TIME DIGESTER SYSTEM SHUTDOWN COMPLETED:*** _____

***OPERATOR NAME:*** _____ ***DATE:*** _____ ***TIME:*** _____

****IF THE SSM PLAN WAS NOT FOLLOWED IN SHUTDOWN OF THE BATCH DIGESTER SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

## 3. BATCH DIGESTER SYSTEM MALFUNCTION EMISSIONS MINIMIZATION CHECKLIST

Below is a description of the various malfunctions and associated operational events for the batch digester system with the corresponding emissions minimization information. These malfunctions and events include such issues as safety interlocks, process alarms, and equipment failures. The malfunctions listed are those that would likely cause excess emissions of either pulping vent gases or pulping condensate.

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| Blow Tank Pressure Seal Relief | Malfunctions | |
| | Blow valve opening too fast | 0 |
| | Improper accumulator circulation control loop | 0 |
| | Condenser vent pressure valve open | 0, S |
| | Condenser drain plugged | 0, S |
| | Low cooling water supply flow | 0, S |
| | Vent gases are accumulating in system between blows | 0 |
| | Plugged flame arrester | B |
| | Fiber or liquor in accumulator water due to high blow tank level | |
| | High or low cooling water temperature | 0, S |
| | High cyclone level | 0 |
| | Padding Steam control failure | 0 |
| | Emissions minimization steps | |
| | Identify the cause of over pressure. | |
| | Correct problem and return vent gases to collection system(s). | |
| | If the problem cannot be corrected in a timely manner, begin to bottle-up or shutdown the digester system, as soon as practicable, if necessary for repairs. | |

Description of Malfunctions (continued)

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| High Blow Heat Condenser or Turpentine Condenser Vent Temperature | <u>Malfunction</u><br>Low cooling water supply flow<br>Heat exchanger is plugged or plugging<br>High cooling water temperature<br>Condenser system malfunction<br><u>Emissions minimization steps</u><br>Divert a colder water source to the condenser<br>If condenser is plugged, begin to bottle-up or shutdown the digester system, when practicable, if necessary for repairs.. | <br>0<br>S<br>0<br>0, S |
| High Relief Gas Line Pressure | <u>Malfunction</u><br>Plugged or plugging gas separator or cyclone<br>Plugged or plugging turpentine condenser<br>Plugged or plugging line or other in-line device<br>Plugged flame arrester<br><u>Emissions minimization steps</u><br>If the problem cannot be corrected in a timely manner, begin to bottle-up or shutdown the digester system, when practicable, if necessary for repairs.. | <br>B<br>0<br>S<br>B, S |
| Mechanical or Electrical Malfunctions | <u>Malfunctions</u><br>Power Failure<br>Instrument Loop Failure<br>Pump or Valve Failure<br>Motor Failure<br><u>Emissions Minimization Steps</u><br>If possible, continue the collection of vent gases. Monitor the condensate conductivity during the malfunction and divert the minimum amount of condensate. Restore collection or vent gases and condensate as soon as practicable. | <br>S<br>B, S<br>B, S<br>O, S |
| High Turpentine Underflow Conductivity | <u>Malfunction</u><br>Improper gas separation<br><u>Emissions minimization steps</u><br>Divert underflow to sewer | <br>0 |

Note 1

"O" indicates that the malfunction or device can be verified and corrected while the source is operational.

"B" indicates the malfunction or device can be verified and corrected while the source is operational, but the malfunctioning device must be bypassed and/or isolated.

"S" indicates that the malfunction cannot be verified or corrected while the system is operational. Such a malfunction will require a temporary shutdown to correct the malfunction.

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

# BATCH DIGESTER SYSTEM - SSM MALFUNCTION INCIDENT REPORT:

***WHAT WAS THE NATURE OF MALFUNCTION EVENT? _____***
***_____***

***WAS SSM CHECKLIST FOLLOWED FOR SYSTEM MALFUNCTION*?*** ***_____***

***TIME THAT VENTING FROM THE DIGESTER/TURPENTINE SYSTEM BEGAN:*** ***_____***

***TIME THAT VENTING FROM THE DIGESTER/TURPENTINE SYSTEM CEASED:*** ***_____***

***TIME THAT DIGESTER/TURPENTINE SYSTEM CONDENSATE OVERFLOW/DIVERSION BEGAN:*** ***_____***

***TIME THAT DIGESTER/TURPENTINE SYSTEM CONDENSATE OVERFLOW/DIVERSION ENDED:*** ***_____***

***WHAT WAS DONE TO CORRECT THE MALFUNCTION?***
***_____***
***_____***

***OPERATOR NAME: _____ DATE:_____ TIME:_____***

****IF THE SSM PLAN WAS NOT FOLLOWED DURING THE MALFUNCTION OF THE BATCH DIGESTER SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***
***_____***
***_____***

## 4. BATCH DIGESTER SYSTEM DESCRIPTION & *SYSTEM FLOW DIAGRAM*

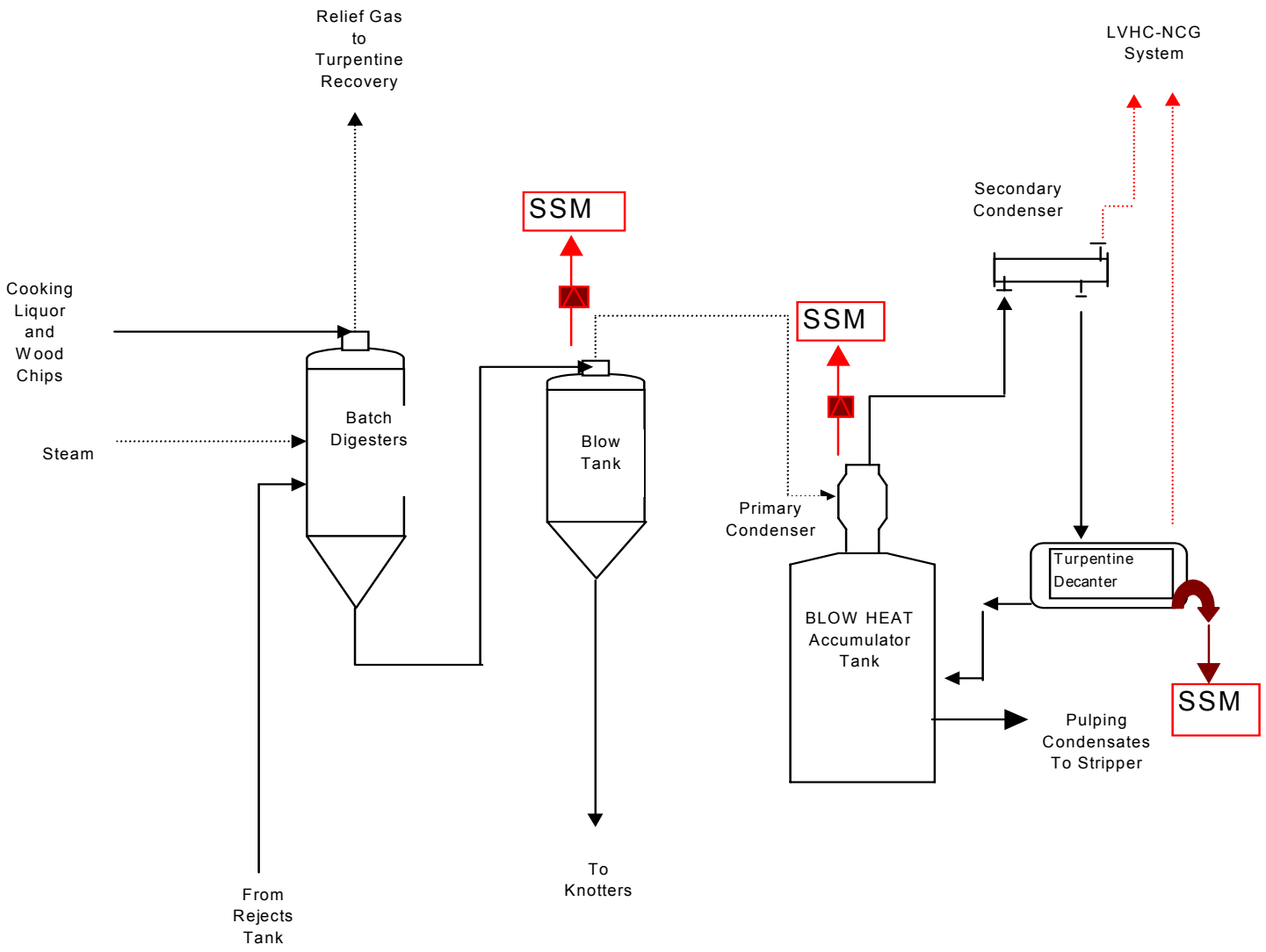
The EPA defines a *Digester System* as follows:
"*Digester system* means each continuous digester or each batch digester used for the chemical treatment of wood or non-wood fibers. The digester equipment includes associated flash tank(s), blow tank(s), chip steamer(s) not using fresh steam, blow heat recovery accumulator(s), relief gas condenser(s), and any other equipment serving the same function as those previously listed. The digester system includes any of the liquid streams or condensate associated with the batch or continuous digester relief, blow, or flash steam process."

The EPA defines a *Turpentine Recovery System* as follows:
"*Turpentine recovery system* means all equipment associated with recovering turpentine from digester system gases including condensers, decanters, storage tanks, and any other equipment serving the same function as those previously listed. The turpentine recovery system includes any liquid streams associated with the turpentine recovery process such as turpentine decanter."

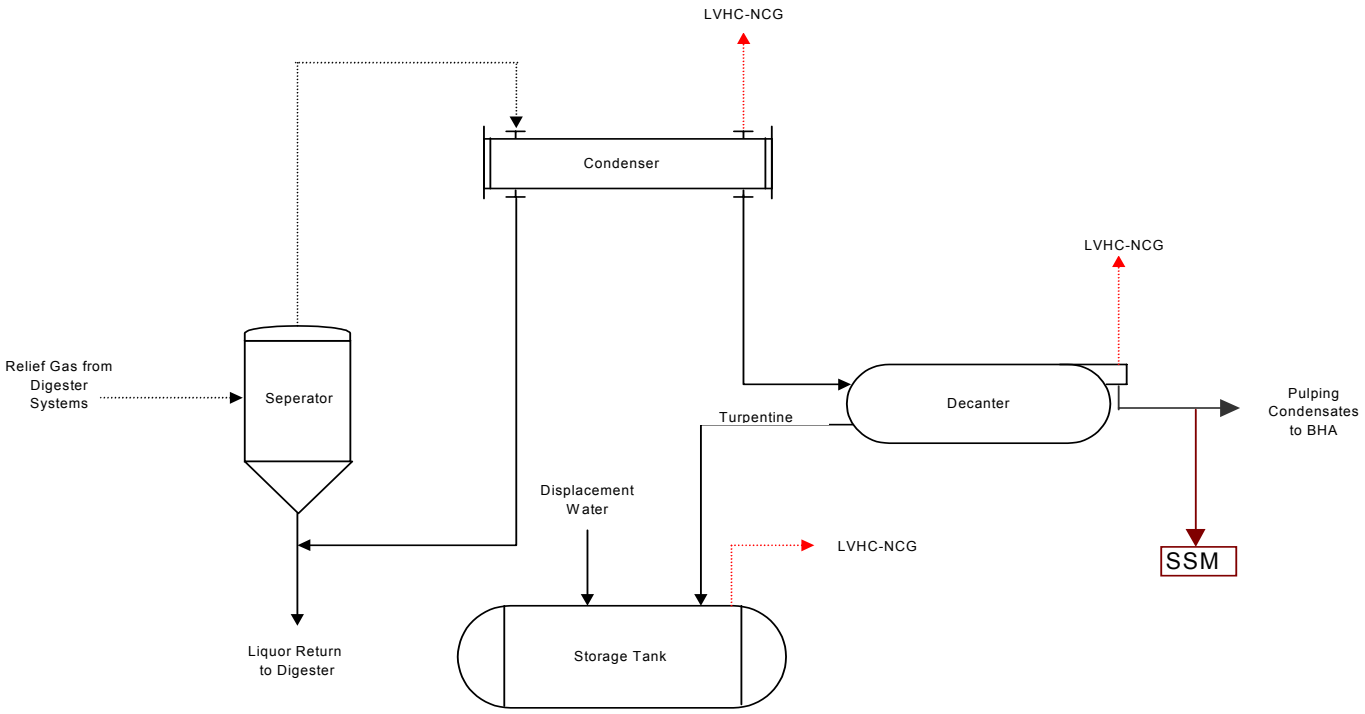
The Batch Digester and associated turpentine recovery systems include the following process equipment: Batch Digesters, Relief Gas System, Blow Tank, Blow Heat Recovery & Accumulator, Knot Removal, and Turpentine Recovery. Sources from the Batch Digester system regulated in the Cluster Rule include the following: Low Volume High Concentration (LVHC NCG)Vent Gases from the: Blow Heat Recovery Secondary Condenser, Turpentine Condenser, Turpentine Decanter, and Turpentine Storage Tank(s). Pulping Condensate from the: Turpentine Decanter Underflow, Blow Heat Indirect Condenser Condensate, and Blow Heat Accumulator Overflow.

The Batch Digester System (diagram attached) SSM plan is triggered when:
- **BATCH DIGESTER SYSTEM STARTUP**
- **BATCH DIGESTER SYSTEM SHUTDOWN**
- **BATCH DIGESTER SYSTEM BLOW TANK Pressure Relief**
- **BATCH DIGESTER SYSTEM B.H. Accumulator Tank Overflow***
- **BATCH DIGESTER SYSTEM B.H. Accumulator Tank Pressure Relief**
- **BATCH DIGESTER SYSTEM Accumulator Condensate High Conductivity**

# Panama City Mill Process Flow Diagram
## Batch Digester System



# Panama City Mill Process Flow Diagram
## Turpentine Recovery System



# THE SSM PLAN FOR THE EVAPORATOR SYSTEM HAS BEEN TRIGGERED!

## PLEASE SELECT THE APPROPRIATE SSM PLAN OR INFORMATION:

1. **EVAPORATOR SYSTEM START-UP PLAN & REPORT FORMS**
2. **EVAPORATOR SYSTEM SHUTDOWN PLAN & REPORT FORMS**
3. **EVAPORATOR SYSTEM MALFUNCTION PLAN & REPORT FORMS**

**4. EVAPORATOR SYSTEM DESCRIPTION & FLOW DIAGRAM**

# 1. EVAPORATOR SYSTEM STARTUP EMISSIONS MINIMIZATION CHECKLIST

Following is the definition of the Evaporator system startup for normal operations and a checklist for the minimization of emissions during the Evaporator system startup period. The startup of each evaporator set is initiated with the introduction of weak black liquor to the set. The startup period ends after the vacuum has stabilized (without use of the hogging jet), the NCG vents have closed and foul condensate is collected (if required). If an evaporator boilout can be conducted without operating the hogging jet or venting NCGs, it will not be considered a startup and SSM will not apply.

**(Note: Record the time and duration that the hogging jet is operating while black liquor is fed to the evaporator as an excess emission)**

Pre-Startup Checklist

The following conditions should be verified prior to collecting vent gases and pulping condensate from the evaporator system.

- Are the control systems for vent gases and pulping condensate operating and ready to accept the LVHC and pulping condensate streams from the evaporator system?
- Are the condensate conductivity diversion systems operating normally?
- Is there adequate capacity in the stripper feed tank for 1-A evaporator startup, if the 1-A condensate will be stripped?

Startup Emissions Minimization Checklist

- Introduce black liquor to the evaporator system, slowly ramping up the product liquor solids by increasing evaporator steam pressure, until the product liquor solids target set-point has been reached.
- Try to minimize the time that the hogging jet is operating after liquor feed has begun.
- Prior to adding condensate to the collection system, verify that the condensate conductivity level is below the conductivity level determined for the specific mill configuration. The conductivity diversion system will automatically send pulping condensate with a high conductivity to the boil out tank.
- Add LVHC NCG vent gases and pulping condensate to the appropriate collection systems after stable vacuum has been achieved and the hogging jet has been turned off.

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

# ***SSM STARTUP INCIDENT REPORT:***

***TIME LIQUOR FEED TO EVAPORATOR SET BEGAN:*** _____

***WAS THE SSM CHECKLIST FOLLOWED IN STARTUP OF THE EVAPORATOR SYSTEM*?*** _____

***TIME THAT VENTING FROM EVAPORATOR SYSTEM OR HOGGING JET STARTED:*** _____

***TIME THAT VENTING FROM EVAPORATOR SYSTEM AND HOGGING JET CEASED:*** _____

***TIME EVAPORATOR SYSTEM FOUL CONDENSATE DIVERTED OR OVERFLOWED TO SEWER?*** _____

***TIME EVAPORATOR SYSTEM FOUL CONDENSATE COLLECTED AND PUMPED TO FOUL CONDENSATE COLLECTION TANK?*** _____

***TIME THAT EVAPORATOR STARTUP PERIOD ENDED:*** _____

***OPERATOR NAME:*** _____ ***DATE:***_____ ***TIME:***_____

****IF THE SSM PLAN WAS NOT FOLLOWED IN STARTING THE EVAPORATOR SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

## 2. EVAPORATOR SYSTEM SHUTDOWN EMISSIONS MINIMIZATION CHECKLIST

Below is the definition of the evaporator system shutdown from normal operations and a checklist for the minimization of emissions during the evaporator system shutdown period**.** The evaporator shutdown period begins with the end of liquor feed to the evaporator set and ends when the evaporator is flushed with water or combined condensate and the steam is turned off. The proper sequence of shutdown is the source, followed by the collection and transportation system, and finally the control system.

Pre-Shutdown Checklist

The following conditions should be verified prior to shutdown of the evaporator system and diversion of vent gases and pulping condensate from the collection, transportation, and control systems.

- Are the condensate conductivity diversion systems operating normally?
- Can the LVHC NCG collection and control systems continue to operate while the evaporator is shutting down?

Shutdown Emissions Minimization Checklist

- Try to collect the evaporator LVHC NCG gas vents until after the evaporator system has been completely shutdown.

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

# ***SSM SHUTDOWN INCIDENT REPORT:***

***TIME THAT EVAPORATOR SHUTDOWN WAS STARTED:*** _____

***WAS THE SSM CHECKLIST FOLLOWED IN SHUTDOWN OF THE EVAPORATOR SYSTEM*?*** _____

***TIME EVAPORATOR SYSTEM NCG SOURCE VENTS OPENED OR HOGGING JET BEGAN VENTING TO THE ATMOSPHERE:*** _____

***TIME EVAPORATOR SYSTEM FOUL CONDENSATE DIVERTED OR OVERFLOWED TO SEWER?*** _____

***TIME EVAPORATOR SYSTEM NCG SOURCE VENTS CLOSED OR HOGGING JET STOPPED VENTING TO THE ATMOSPHERE:*** _____

***TIME EVAPORATOR SYSTEM FOUL CONDENSATE DIVERTED OR OVERFLOW TO SEWER STOPPED?*** _____

***TIME THAT EVAPORATOR SHUTDOWN WAS COMPLETED:*** _____

***OPERATOR NAME:*** _____ ***DATE:*** _____ ***TIME:*** _____

****IF THE SSM PLAN WAS NOT FOLLOWED IN SHUTTING THE EVAPORATOR SYSTEM DOWN, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

## 3. EVAPORATOR SYSTEM MALFUNCTION EMISSIONS MINIMIZATION CHECKLIST

Below is a description of the various malfunctions and associated operational events for the evaporator system with the corresponding emissions minimization information. These malfunctions and events include such issues as safety interlocks, process alarms, and equipment failures. The malfunctions listed are those that would likely cause excess emissions of either pulping vent gases or pulping condensate.

| **Event** | **Malfunctions and Emissions Minimization Steps** | **Operational Effect[(Note 1)]** |
|---|---|---|
| Foul Condensate Diversion | Malfunctions<br>Vacuum system is surging or cycling<br>Leaking tubes<br>High liquor level in vapor body<br>Improper mist eliminator operation<br>High vacuum<br>Low feed liquor solids<br>Emissions Minimization Steps<br>Check the evaporator operation by inspecting the individual condensate sight glasses, vacuum system, and level control loops. Correct the operational problem found or observed. Continue to collect and control vent gases and condensate, if this can be done safely. Follow the SSM shutdown procedure if the evaporator system will shutdown for repairs. | <br><br>O,S<br>S<br>O,S<br>S<br>O<br>O |
| Vacuum Loss – Hogging Jet On While Liquor in Evaporator | Malfunctions<br>Leaking tubes<br>Emissions Minimization Steps<br>Check the evaporator operation by inspecting the vacuum system and the level control loops. Correct the operational problem found or observed. If the vacuum cannot be maintained without hogging jet, shutdown the evaporator set as soon as practicable for repair. | <br>O, S |

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect[(Note 1)] |
|---|---|---|
| Unexpected shutdown | <u>Malfunctions</u><br>Power Failure<br>Critical Instrumentation control loop failure<br>Safety interlock trip<br>Steam Ejector Failure<br><u>Emissions Minimization Steps</u><br>Follow the operating manuals and standard operating procedures for responding to an unplanned outage of the evaporator system.<br>If possible maintain the vent gas collection and control system in operation. If not, divert the vent gases to atmosphere.<br>If possible, divert the pulping condensate to the boil-out tank or spill tank. | <br>S<br>S<br>S<br>S<br>S |

**<u>Note 1</u>**

**"O"** indicates that the malfunction or device can be verified and corrected while the source is operational.

**"B"** indicates the malfunction or device can be verified and corrected while the source is operational, but the malfunctioning device must be bypassed and/or isolated.

**"S"** indicates that the malfunction cannot be verified or corrected while the system is operational. Such a malfunction will require a temporary shutdown to correct the malfunction.

**<u>NOTE: THE SSM MALFUNCTION INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!</u>**

# EVAPORATOR SYSTEM - SSM MALFUNCTION INCIDENT REPORT:

***WHAT WAS THE NATURE OF MALFUNCTION EVENT? _____***
***_____***

***WAS SSM CHECKLIST FOLLOWED FOR SYSTEM MALFUNCTION*? _____***

***TIME EVAPORATOR SYSTEM NCG OR HOGGING JET VENTED TO ATMOSPHERE: _____***

***TIME OF FOUL CONDENSATE OVERFLOW TO SEWER: _____***

***TIME THAT SYSTEM MALFUNCTION FIXED AND VENTING CEASED: _____***

***TIME THAT FOUL CONDENSATE OVERFLOW STOPPED: _____***

***WHAT WAS DONE TO CORRECT THE MALFUNCTION? _____***
***_____***
***_____***
***_____***

***OPERATOR NAME: _____ DATE:_____ TIME:_____***

****IF THE SSM PLAN WAS NOT FOLLOWED DURING THE MALFUNCTION OF THE EVAPORATOR SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***
***_____***
***_____***

## 4. EVAPORATOR SYSTEM DESCRIPTION & FLOW DIAGRAM

The EPA defines an ***Evaporator System*** as follows: "*Evaporator System* means all equipment associated with increasing the solids content and/or concentrating spent cooking liquor from pulp washing system including pre-evaporators, multi-effect evaporators, concentrators, and vacuum systems, as well as associated condensers, hotwells, and condensate streams, and any other equipment serving the same function as those previously listed."

The EPA defines ***Black Liquor*** as follows: "*Black liquor* means spent cooking liquor that has been separated from the pulp produced by the Kraft, soda, or semi-chemical pulping process."

The EPA defines ***Spent Liquor*** as follows: "*Spent liquor* means process liquid generated from the separation of cooking liquor from pulp by the pulp washing system containing dissolved organic wood materials and residual cooking compounds."

The Evaporator System includes the following process equipment: Evaporator Effects (typically 5 or 6), Recirculation and Transfer Pumps, Soap separation System, and the Vacuum System (including Condenser(s), Steam Ejector(s), Hotwell(s))

Sources in the Panama City Mill Evaporator system subject to Cluster Rule requirements include the following:

- Low Volume High Concentration NCG Vent Gases from the Vacuum System Vent (typically the Hotwell).
- Segregated (1-A Evaporator set- see following flow diagram) condensate from: Weak Liquor Feed Effects, External Pre-heaters, Baffled Condensing Sections, and Vacuum system condensate from Surface Condenser and Vacuum System after-coolers.

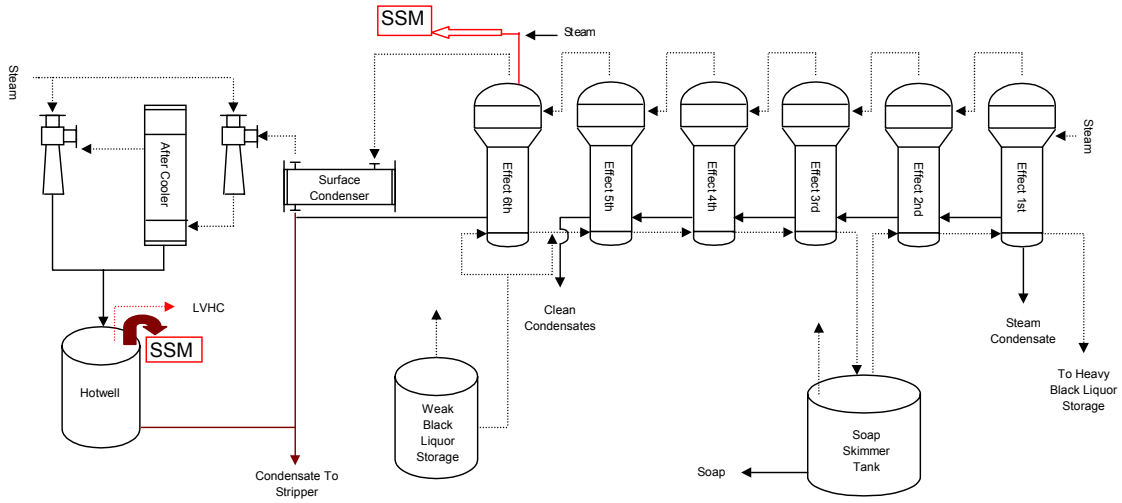
The Panama City Mill SSM Plan is triggered by the following evaporator system events:

- **1-A EVAPORATOR SET STARTUP**
- **1-A EVAPORATOR SET SHUTDOWN**
- **1-A EVAPORATOR SET Hogging Jet Operation***
- **1-A EVAPORATOR SET Condensate High Conductivity Diversion****
- **1-A EVAPORATOR SET Hotwell Overflow****
- **2 EVAPORATOR SET Startup**
- **2 EVAPORATOR SET Shutdown**
- **2 EVAPORATOR SET Hogging Jet Operation***
- **3 EVAPORATOR SET Startup**
- **3 EVAPORATOR SET Shutdown**
- **3 EVAPORATOR SET Hogging Jet Operation***

***at times other than startup when the evaporator is operating on liquor**

****only when <u>not</u> producing Bleached Hardwood Pulp**

# Panama City Mill Process Flow Diagram
## A-1 Evaporator Process Flow



**THE SSM PLAN FOR THE KRAFT PULP BLEACHING SYSTEM HAS BEEN TRIGGERED!**

**PLEASE SELECT THE APPROPRIATE SSM PLAN OR INFORMATION:**

1. **BLEACHING SYSTEM START-UP PLAN & REPORT FORMS**
2. **BLEACHING SYSTEM SHUTDOWN PLAN & REPORT FORMS**
3. **BLEACHING SYSTEM MALFUNCTION PLAN & REPORT FORMS**

**4. BLEACHING SYSTEM DISCRIPTION & FLOW DIAGRAM**

# 1. BLEACHING SYSTEM STARTUP EMISSIONS MINIMIZATION CHECKLIST

Below is the definition of the system startup for normal operations and a checklist for the minimization of emissions during the system startup period. The Pulp Bleaching system operation is initiated by adding Chlorine Dioxide to unbleached pulp in the first $ClO_2$ mixer**. The operation of the Bleach Plant Gas Collection and Scrubbing System must always precede the Pulp Bleaching system startup**. The Bleach Plant Gas System is an air dilute system and can be operational prior to process sources being operational without a compromise to safety or operating costs. The Pulp Bleaching system startup period is defined as beginning with the startup of the Bleach Plant Gas Collection and Scrubbing System and ends after saleable bleached pulp enters the bleached high density pulp storage chest.

Pre-Startup Checklist

The following conditions must be verified prior to adding chlorine dioxide to the pulp in the first $ClO_2$ mixer.

- Is the Bleach Plant Scrubber operating within the targeted fan flow/amperage, scrubber flow and scrubber pH ranges?
- Have all the collection hoods and vent lines been checked and verification completed insuring that there are no visible emissions?

Startup Emissions Minimization Checklist

- Begin startup of the Bleach Plant following mill standard operating procedures.
- Insure all vent gases, from process equipment that uses chlorinated compounds, is being collected and sent to the Bleach Plant scrubber.
- Verify proper operation of the Bleach Plant scrubber.

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

## ***BLEACHING SYSTEM SSM STARTUP INCIDENT***

***WAS THE SSM CHECKLIST FOLLOWED IN STARTUP OF THE BLEACHING SYSTEM*?*** _____

***TIME BLEACHING SYSTEM SCRUBBER OPERATIONS ARE WITHIN REQUIRED PARAMETRIC MONITORING RANGES:*** _____

***TIME OF INITIAL CHLORINE DIOXIDE FEED TO THE BLEACHING SYSTEM:*** _____

***TIME THAT VENTING FROM BLEACHING SYSTEM VENT COLLECTION STARTED:*** _____

***TIME THAT VENTING FROM BLEACHING SYSTEM VENT COLLECTION CEASED:*** _____

***TIME SALEABLE PULP PRODUCED AND FLOWING INTO THE BLEACHED HIGH DENSITY PULP STORAGE CHEST?*** _____

***OPERATOR NAME:*** _____ ***DATE:*** _____ ***TIME:*** _____

****IF THE SSM PLAN WAS NOT FOLLOWED IN STARTING THE BLEACHING SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

## 2. BLEACHING SYSTEM SHUTDOWN EMISSIONS MINIMIZATION CHECKLIST

Shutdown Procedures
Below is the definition of the transition from normal operations to shutdown and a checklist for the minimization of emissions during the system shutdown period.

The Pulp Bleaching system shutdown is initiated by stopping addition of Chlorine Dioxide to unbleached pulp in the first $ClO_2$ mixer**. The operation of the Bleach Plant Gas Collection and Scrubbing System must always continue after the Pulp Bleaching system shutdown**. The Bleach Plant Gas System is an air dilute system and can be operational prior to process sources being operational without a compromise to safety or operating costs. The Pulp Bleaching system shutdown period is defined as beginning with the end of Chlorine Dioxide addition to unbleached pulp and the shutdown period ends after all bleaching towers are empty, bleached pulp pumping has stopped, and the Bleach Plant Gas Collection and Scrubbing System has been shutdown.

Pre-Shutdown Checklist
The following conditions must be verified prior shutdown of the Bleach Plant Gas Collection and Scrubbing System.

- Has the Bleach Plant been shutdown and all pulp in the process equipment using chlorinated compounds been processed?

Shutdown Emissions Minimization Checklist

- The Bleach Plant Gas Collection and Scrubbing System should be operated until the Bleach Plant sources are shutdown (and vented to atmosphere) following the source specific shutdown procedures
- Shutdown all area collection and scrubber fans.
- Proceed to shutdown all Bleach Plant Gas collection system equipment.
- Shutdown the Bleach Plant scrubber

**NOTE: THE SSM INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!**

# ***BLEACHING SYSTEM SSM SHUTDOWN INCIDENT REPORT***

***WAS THE SSM CHECKLIST FOLLOWED IN SHUTDOWN OF THE BLEACHING SYSTEM*?*** _____

***TIME THAT CHLORINE DIOXIDE USAGE CEASED:*** _____

***TIME THAT PULP FLOW STOPPED:*** _____

***TIME THAT BLEACHING SYSTEM SCRUBBER SHUT DOWN:*** _____

***OPERATOR NAME:*** _____ ***DATE:*** _____ ***TIME:*** _____

****IF THE SSM PLAN WAS NOT FOLLOWED IN SHUTTING THE BLEACHING SYSTEM DOWN, PLEASE EXPLAIN WHAT WAS DONE:***

_____

_____

## 3. BLEACHING SYSTEM MALFUNCTION EMISSIONS MINIMIZATION CHECKLIST

Below is a description of the various Pulp Bleaching System and Bleach Plant vent gas collection and scrubbing system malfunction events with the corresponding corrective actions or troubleshooting guides. These malfunction events include safety interlocks, process alarms, and equipment failures. The malfunction items listed are those that would trigger a "vent to atmosphere" condition.

| **Event** | **Malfunctions and Emissions Minimization Steps** | **Operational Effect[(Note 1)]** |
|---|---|---|
| Loss of or Low Bleach Plant Scrubber Recirculating Liquid Flow | Malfunctions<br>Scrubber saddles plugged<br>Scrubber recirculation pump failure<br>Emission Minimization Steps<br>Determine the nature of the problem. Switch to the spare scrubber recirculation pump, if the pump is the cause. If the repair will take a prolonged length of time, shut the Pulp Bleaching System down as soon as practicable. | <br>B, S |
| Scrubber liquid ORP or pH range exceedance | Malfunctions<br>Scrubber caustic makeup pump failure<br>ORP or pH instrument failure<br>Emission Minimization Steps<br>Verify that scrubber makeup chemical pump flow is in normal range. If makeup flow is low, switch to spare caustic or white liquor pump if available. Call for calibration of the pH and ORP gauges. Calibrate or replace the probes as necessary. If the repair will take a prolonged length of time, shut the Pulp Bleaching System down as soon as practicable. | |
| Gas blower or fan inoperable | Malfunctions<br>Motor failure<br>Bearing failure<br>Impeller failure | <br>S<br>S<br>S |

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect[(Note 1)] |
|---|---|---|
| Other Mechanical Failure | <u>Emission Minimization Steps</u><br>Take maintenance action to repair the malfunction.<br>If the repair will take a prolonged length of time, the Pulp Bleaching system will need to be shutdown, as soon as practicable. | |
| Electrical Component Failure | <u>Malfunctions</u><br>Instrument Loop Failure<br>Power Failure<br><u>Emissions minimization steps</u><br>If the malfunction is at the vent gas source, isolate the problem by venting the source.<br>Take maintenance action to repair the malfunction.<br>If the repair will take a prolonged length of time, the Pulp Bleaching system will need to be shutdown as soon as practicable. | <br>B, S<br>S |

**<u>Note 1</u>**

**"O"** indicates that the malfunction or device can be verified and corrected while the source is operational.

**"B"** indicates the malfunction or device can be verified and corrected while the source is operational, but the malfunctioning device must be bypassed and/or isolated.

**"S"** indicates that the malfunction cannot be verified or corrected while the system is operational. Such a malfunction will require a temporary shutdown to correct the malfunction.

**<u>NOTE: THE SSM MALFUNCTION INCIDENT REPORT ON THE FOLLOWING PAGE MUST BE COMPLETED BY THE OPERATOR!</u>**

# BLEACHING SYSTEM - SSM MALFUNCTION INCIDENT REPORT:

***WHAT WAS THE NATURE OF MALFUNCTION EVENT?*** _____
_____

***WAS SSM CHECKLIST FOLLOWED FOR SYSTEM MALFUNCTION*?*** _____

***TIME OF SCURBBER/GAS COLLECTION SYSTEM MALFUNCTION:*** _____

***TIME PULP BLEACHING SYSTEM OPERATION CEASED OR THE TIME BLEACHING SYSTEM SCRUBBER OPERATIONS ARE WITHIN REQUIRED PARAMETRIC MONITORING RANGES:*** _____

***WHAT WAS DONE TO FIX THE MALFUNCTION?*** _____
_____
_____

***OPERATOR NAME:*** _____ ***DATE:***_____ ***TIME:***_____

****IF THE SSM PLAN WAS NOT FOLLOWED DURING THE MALFUNCTION OF THE BLEACHING SYSTEM, PLEASE EXPLAIN WHAT WAS DONE:***
_____
_____

# 4. BLEACHING SYSTEM DESCRIPTION & FLOW DIAGRAM

System Description

The EPA defines a ***Bleaching System*** as follows:

"*Bleaching system* means all process equipment after high-density pulp storage prior to the first application of oxidizing chemicals or reducing chemicals following the pulping system, up to and including the final bleaching stage."

The EPA defines ***Bleaching*** as follows:

"*Bleaching* means brightening of pulp by the addition of oxidizing chemicals or reducing chemicals."

The EPA defines ***Bleaching Line*** as follows:
"*Bleaching line* means a group of bleaching stages arranged in series such that bleaching of the pulp progresses as the pulp moves from one stage to the next."

The EPA defines ***Bleaching Stage*** as follows:

"*Bleaching stage* means all process equipment associated with a discrete step of chemical application and removal in the bleaching process including chemical and steam mixers, bleaching towers, washers, seal (filtrate) tanks, vacuum pumps, and any other equipment serving the same function as those previously listed."

The Bleach Plant Gas System may include the following process equipment: Source Balancing valves, Washer Hoods, Ducting, Gas Blower(s),Steam Coil Air Heaters, and a Bleach System Scrubber

The bleach plant vent gas collection system collects from the following process equipment that use chlorinated compounds:
Towers
Washers
Filtrate Tanks
Vacuum Pump Exhausts

The bleach plant vent gas collection system is an air dilute open vent collection system. In this sense, the system is "decoupled" from the process

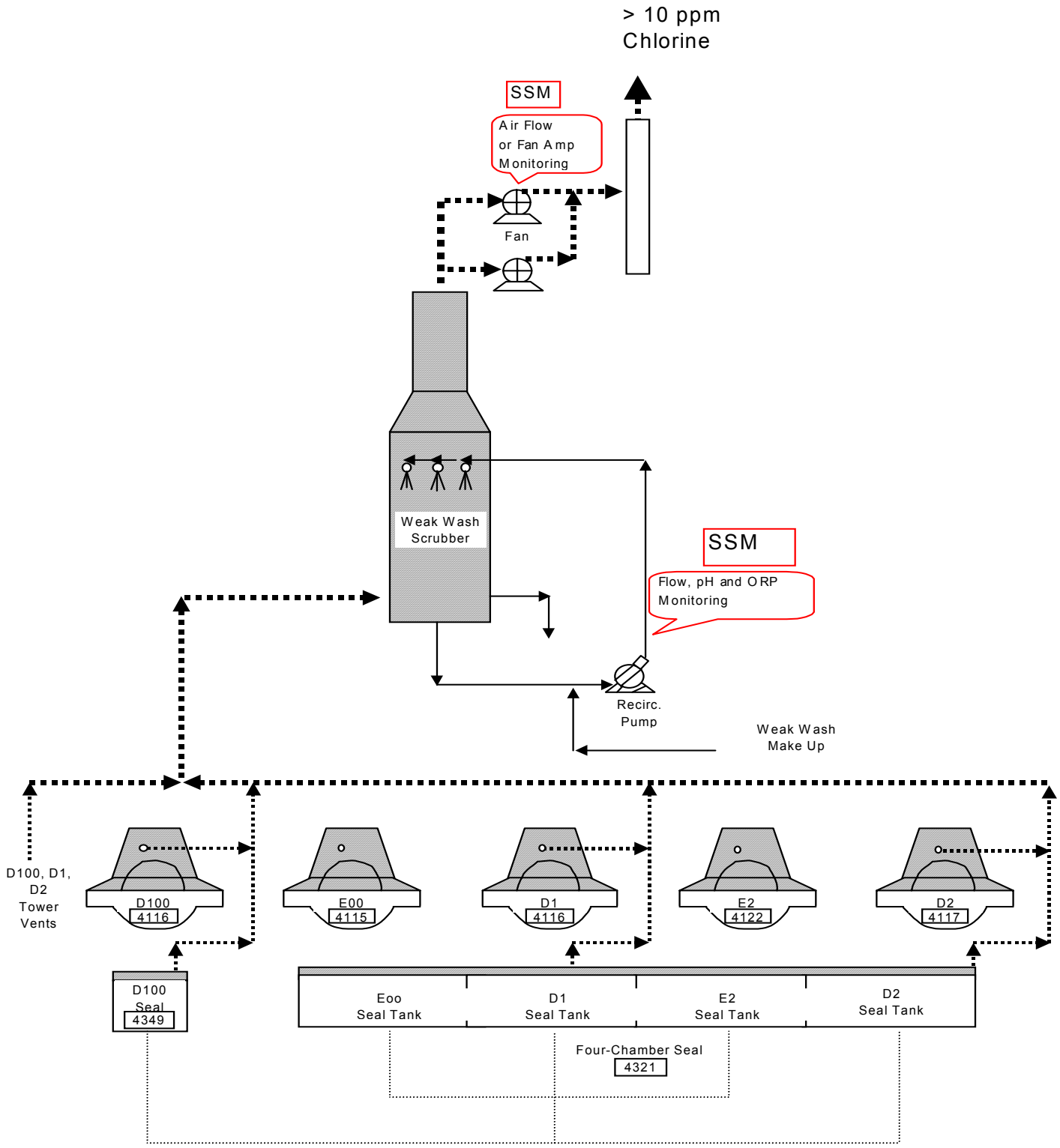
equipment, similar to the HVLC system of the pulp mill, meaning that the collection system can continue to run even when the process equipment is down. Therefore, upsets that cause the process source equipment to go down do not necessarily cause the bleach plant vent collection system to vent or go down unless the process upset introduces fiber or liquor carryover into the vent collection system. For purposes of the SSM plan, the startup, shutdown, and malfunction events are limited to those that affect the vent gas collection system directly.

**The Panama City Bleaching System SSM Plan is triggered by the following events:**

- **BLEACHING SYSTEM STARTUP**
- **BLEACHING SYSTEM SHUTDOWN**
- **BLEACHING SYSTEM SCRUBBER ORP or pH Range Alarm**
- **BLEACHING SYSTEM SCRUBBER Gas Flow Range Alarm**
- **BLEACHING SYSTEM SCRUBBER Liquid Flow Alarm**

# PANAMA CITY PROCESS FLOW DIAGRAM

## BLEACHING SYSTEM SCRUBBER



# KRAFT CHEMICAL RECOVERY FURNACE SYSTEM STARTUP & EMISSIONS MINIMIZATION CHECKLIST

Below are excerpts from the standard operating procedures that are to be followed to minimize emissions during the startup of the Recovery Furnace system and a checklist for the minimization of particulate emissions during the system startup period. The Recovery Furnace should be fully operational, on-line, and the ESP heated and fully operational firing fossil fuel prior to introduction of Black Liquor into the Recovery Furnace.

Verification of Startup Conditions

The startup period for the Kraft Chemical Recovery Furnace begins when black liquor is burned in the Recovery Furnace. The startup period ends and operation begins when green liquor is produced. The following conditions must be verified prior to introducing Black Liquor into the Recovery Furnace:

- Has the boiler been properly brought up burning fossil fuel and are all major subsystems operating within standard startup operating conditions? The major subsystems of concern are listed as follows: DCS operation; Feed water system, Condensate system, Boiler blow-down, I.D. fan, Compressed air system, Fossil Fuel firing system, Black Liquor concentrator and Black Liquor recirculating and nozzle feed systems.
- Is the combustion air distribution system is operating normally and distribution in the combustion zone according to standard operating procedures?
- Is the flame safety system and rapid drain system operating and has the operator verified that all permissives have been met?

Startup Emissions Minimization Checklist

- Is the Recovery Furnace boiler operating on the fossil fuel burners and producing steam and is a pilot or auxiliary fuel burner operating at the liquor firing nozzles?
- Is the ESP heated and are the ESP T-R sets powered and the ESP control system operating?
- Is the ESP ash recovery system operating?
- Is the Recovery Furnace Opacity monitoring system operating?
- Is the smelt recovery system and smelt tank vent scrubber system operating?
- Is the smelt tank vent scrubber monitoring system operating?

If the Startup Emissions Minimization Checklist has been followed, initiate black liquor firing in the Chemical Recovery Furnace following BLRBAC and standard boiler operating procedures while maintaining the stack gas opacity at less than 20%.

# KRAFT CHEMICAL RECOVERY FURNACE SYSTEM SHUTDOWN & EMISSIONS MINIMIZATION CHECKLIST

Below are excerpts from the standard operating procedures that are to be followed to minimize emissions during the shutdown of the Kraft Chemical Recovery Furnace system and a checklist for the minimization of particulate emissions during the system shutdown period. The ESP serving to control emissions from the Recovery Furnace should be fully operational until black liquor is no longer burned and smelt is no longer produced (i.e. green liquor is no longer being produced).

Verification of Shutdown conditions:
The Chemical Recovery Furnace shutdown sequence starts when liquor guns are no longer firing and ends when smelt production has stopped.

Shutdown Emissions Minimization Checklist

- Full operation of the ESP and Opacity meter(s) should continue after black liquor firing has ceased, until the flow of smelt from the shouts has stopped and the generation of green liquor has also ceased.
- BLRBAC and standard operating procedures must be followed in shutdown of the Chemical Recovery Furnace,
- During shutdown of the Chemical Recovery Furnace, manage fossil fuel burning and adjust combustion air to maintain stack gas opacity less than 20 % during the shutdown period.

# KRAFT CHEMICAL RECOVERY FURNACE COMBUSTION SYSTEM - MALFUNCTION & EMISSIONS MINIMIZATION CHECKLIST

Corrective action must be taken to address any malfunction of the Recovery Furnace causing greater than 20 % stack gas opacity for more than one hour. Excess stack gas opacity can be caused by boiler combustion system malfunction or problems with the Recovery Furnace Electrostatic Precipitator.

The Recovery Furnace **combustion system malfunctions** listed here are those that could cause stack gas opacity excursions in excess of 20% which requires corrective action. Below is a description of the various malfunctions and associated operational events for the Recovery Furnace combustion system with the corresponding emissions minimization information.

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| Low Furnace Oxygen | Malfunctions<br>Improper air to fuel ratio<br>Low combustion air flow<br>High liquor or fossil fuel flow<br>I.D. Fan Malfunction<br>Emissions Minimization Steps<br>Continue to burn black liquor and fossil fuel as long as the boiler and ESP are operational and all flame safety permissives are being met. Reduce liquor and/or fossil fuel flow and adjust air to fuel ratio to re-establish less than 20 % stack gas opacity. Following repair, reestablish full liquor and/or fossil fuel flow following the BLRBAC and standard operating procedures while maintaining the stack gas opacity at less than 20%. | <br>O<br>O<br>O |
| Liquor Nozzle pluggage or Liquor feed disruption | Malfunctions<br>Liquor Burner Nozzle pluggage,<br>Liquor feed pump failure,<br>Liquor feed line pluggage,<br>Liquor heater failure,<br>Emissions Minimization Steps<br>Continue to burn black liquor and fossil fuel as long as the boiler and ESP are operational and all flame safety permissives are being met. When practicable, reduce or suspend liquor firing until stack gas opacity less than 20% can be maintained. Following repair, reestablish full liquor and/or fossil fuel flow following the BLRBAC and standard operating procedures while maintaining the stack gas opacity at less than 20%. | <br>O, B |

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| Furnace Tube Pluggage | Malfunctions<br>Soot Blower Malfunction,<br>Emissions Minimization Steps<br>Continue to burn black liquor and fossil fuel as long as the boiler and ESP are operational and all flame safety permissives are being met. When practicable, reduce or suspend liquor firing until stack gas opacity less than 20% can be maintained. Following repair, re-establish full liquor and/or fossil fuel flow following the BLRBAC and standard operating procedures while maintaining the stack gas opacity at less than 20%. | <br>O |
| Emergency Shutdown or Safety System Permissive Failure | Malfunctions<br>Power Failure,<br>Boiler Tube Failure – Rapid Drain<br>Flame safety permissive system failure,<br>Burner system malfunction<br>Emissions Minimization Steps<br>Discontinue black liquor and/or fossil fuel burning following BLRBAC shutdown or standard operating procedures. Following repair, re-establish full liquor and/or fossil fuel flow following the BLRBAC or boiler standard operating procedures while maintaining the stack gas opacity at less than 20%. | <br>S<br>S<br>B<br>B |
| Opacity Monitor Malfunction | Malfunctions<br>Opacity Monitor Calibration Error<br>Opacity Monitor “Out of Control”<br>DCS System Malfunction<br>Emissions Minimization Steps<br>Continue to burn black liquor and fossil fuel, as before the opacity meter or DCS malfunction, as long as the boiler and ESP are operational and all flame safety permissives are being met. Take maintenance action to repair the opacity meter or DCS as soon as possible. | <br>O<br>O<br>O |

Note

"O" indicates that the malfunction or device can be verified and corrected while the source is operational.

"B" indicates the malfunction or device can be verified and corrected while the source is operational, but the malfunctioning device must be bypassed and/or isolated.

"S" indicates that the malfunction cannot be verified or corrected while the system is operational. Such a malfunction will require a temporary shutdown to correct the malfunction.

# KRAFT CHEMICAL RECOVERY FURNACE ELECTROSTATIC PRECIPITATOR MALFUNCTION & EMISSIONS MINIMIZATION CHECKLIST

Corrective action must be taken to address any malfunction of the Recovery Furnace causing greater than 20 % stack gas opacity for more than one hour. Excess stack gas opacity can be caused by boiler combustion system malfunction or problems with the Recovery Furnace Electrostatic Precipitator.

The Recovery Furnace **Electrostatic Precipitator malfunctions** listed here are those that could cause stack gas opacity excursions in excess of 20% which requires corrective action. Below is a description of the various malfunctions and associated operational events for the Recovery Furnace Electrostatic Precipitator with the corresponding emissions minimization information.

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| Single ESP Field Electrical or Mechanical Failure | Malfunctions<br>Broken or grounded electrode in one field<br>Single Transformer-Rectifier failure<br>ESP Control System failure affecting one field<br>Ash Removal System Failure or Pluggage in one field<br>Emissions Minimization Steps<br>Continue to burn black liquor and fossil fuel as long as the boiler and remaining ESP fields are operational. Reduce liquor and/or fossil fuel flow and adjust air to fuel ratio to re-establish less than 20 % stack gas opacity. Following repair, reestablish full liquor and/or fossil fuel flow following BLRBAC and standard boiler operating procedures while maintaining the stack gas opacity at less than 20%. | <br>B<br>B<br>B<br>B |

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| Single ESP Chamber (side) Electrical or Mechanical Failure | Malfunctions<br>Broken or grounded electrodes in multiple fields<br>Multiple Transformer-Rectifier failure<br>ESP Chamber Control System Failure<br>Chamber Ash Collection System Failure<br>Emissions Minimization Steps<br>Continue to burn black liquor and fossil fuel as long as the boiler and one chamber of the ESP are operational. Close the isolation damper to divert all combustion gasses through the remaining operational ESP Chamber. When practicable, reduce black liquor firing until stack gas opacity from the operating chamber less than 20% can be maintained. Following repair, open the closed chamber isolation damper and power the T-R units after the chamber has been heated to 250°F. After full ESP power has been reestablished, gradually return to full liquor and/or fossil fuel flow following the BLRBAC and standard boiler operating procedures while maintaining the stack gas opacity at less than 20%. | <br>B<br>B<br>B |
| Total ESP Electrical or Mechanical Failure | Malfunctions<br>Power Interruption,<br>ESP Control System Failure<br>Ash Collection System Failure<br>Emissions Minimization Steps<br>When practicable, reduce or suspend liquor firing until stack gas opacity less than 20% can be maintained. Following repair, re-establish full liquor and/or fossil fuel flow following the BLRBAC and boiler standard operating procedures while maintaining the stack gas opacity at less than 20%. | <br>S<br>S |
| Emergency Shutdown | Malfunctions<br>Power Failure,<br>Boiler Tube Failure – Rapid Drain<br>Emissions Minimization Steps<br>Discontinue black liquor and/or fossil fuel burning following BLRBAC shutdown and boiler standard operating procedures, if required. Following the repair, purge and restart the boiler using BLRBAC, standard operating and SSM startup procedures. Re-establish full liquor and/or fossil fuel flow following the BLRBAC or boiler standard operating procedures while maintaining the stack gas opacity at less than 20%. | <br>S<br>S |

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| Opacity Monitor Malfunction | <u>Malfunctions</u><br>Opacity Monitor Calibration Error<br>Opacity Monitor "Out of Control"<br>DCS System Malfunction<br><u>Emissions Minimization Steps</u><br>Continue to operate the Recovery Furnace as it was operating before the malfunction of the opacity meter or DCS system occurred, as long as the boiler and ESP are operational and all flame safety permissives are being met. Take maintenance action to repair the opacity meter or DCS as soon as possible. | <br>O<br>O<br>O |

<u>Note</u>

"O" indicates that the malfunction or device can be verified and corrected while the source is operational.

"B" indicates the malfunction or device can be verified and corrected while the source is operational, but the malfunctioning device must be bypassed and/or isolated.

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Stone Container Corporation
Panama City Mill

No. 1 and No. 2 Recovery Boiler Precipitator - Maintenance Checklist

**Weekly**

1. Check T/R set controllers for proper operation
2. Check rapper starters
3. Check rapper PLC cabinet, ventilation fan and filter
4. Check T/R set controllers for obvious damage
5. Check cabinet ventilation and SCR fans
6. Visually inspect heated shell system
7. Replace filters on pressurizing fans
8. Check T/R sets for obvious damage or leaks, check oil levels, check temperature of T/R sets

**Annual Outage**

1. Overhaul precipitator

3/10/04

# SMELT DISSOLVING TANK VENT VENTURI SCRUBBER
# MACT II
# STARTUP & EMISSIONS MINIMIZATION CHECKLIST

Below are excerpts from the standard operating procedures that are to be followed to minimize particulate emissions during the startup of the Smelt Dissolving Tank system equipped with a Venturi type Vent Scrubber and a checklist for the minimization of emissions during the system startup period. The Recovery Furnace Boiler should be fully operational and the scrubber recirculating flow(s) and venturi differential pressure within normal startup ranges prior to burning black liquor in the Recovery Furnace.

## Verification of Startup Conditions

The startup period for the smelting system begins when black liquor is burned in the Recovery Furnace. The startup period ends and operation begins when green liquor is produced. The following conditions must be verified prior to introducing Black Liquor into the Recovery Furnace:

- Is the smelt tank vent scrubber fan operating and is the scrubber $\Delta P$ within the minimum range expected prior to startup?
- Is the smelt tank vent scrubber recirculation flow and scrubber nozzle pressure within normal limits?

## Startup Emissions Minimization Checklist

Begin burning black liquor in the Recovery Furnace and begin weak wash flow to the smelt dissolving tank(s) as soon as smelt is produced. Maintain sufficient scrubber $\Delta P$ and the scrubber recirculating flow(s) to avoid established limit excursions during the startup period.

# SMELT DISSOLVING TANK VENT VENTURI SCRUBBER

## MACT II
## SHUTDOWN & EMISSIONS MINIMIZATION CHECKLIST

Below are excerpts from the standard operating procedures that are to be followed to minimize particulate emissions during the shutdown of the Smelt Dissolving Tank system equipped with a Venturi type Scrubber and a checklist for the minimization of emissions during the system shutdown period. The operator should maintain scrubber recirculating flow(s) and venturi differential pressure during the smelt dissolving tank system shutdown period.

Verification of Shutdown Conditions

The Smelt Dissolving Tank system shutdown period begins when black liquor burning in the Recovery Furnace is stopped and the shutdown period ends when green liquor is no longer produced by the smelt dissolving tank. The following conditions must be verified prior to smelt dissolving tank system shutdown:

- Is the scrubber $\Delta P$ within the range expected prior to shutdown?
- Is the scrubber recirculation flow within normal limits?

Shutdown Emissions Minimization Checklist

The scrubber recirculating flow should the maintained and the scrubber $\Delta P$ operated as high as possible during the shutdown period until green liquor is no longer produced from the smelt dissolving tank.

# SMELT DISSOLVING TANK VENT VENTURI SCRUBBER

## MACT II
## MALFUNCTION & EMISSIONS MINIMIZATION CHECKLIST

Below is a description of the various malfunctions and associated operational events for the Smelt Dissolving Tank system equipped with a Venturi type Vent Scrubber and corresponding particulate emission minimization information. These malfunctions and events include such issues as safety interlocks, process alarms, and equipment failures. The malfunctions listed are those that would likely cause excess particulate emissions.

| **Event** | **Malfunctions and Emissions Minimization Steps** | **Operational Effect**** |
|---|---|---|
| Scrubber ΔP Range Excursion | Malfunctions<br>Scrubber fan fouling or failure<br>Venturi Pluggage or Venturi Control<br>Scrubber Differential Gauge Malfunction<br>Emissions Minimization Steps<br>If the scrubber pressure differential range cannot be maintained, Recovery Furnace black liquor firing and smelt flow should be reduced until the proper ΔP can be restored. If the ΔP cannot be restored in a timely manner, suspend Recovery Furnace liquor firing until repairs can be made. | <br>S<br>S<br>O |
| Scrubber Recirculation Flow Excursion | Malfunctions<br>Recirculation Pump Malfunction<br>Scrubber Nozzle Pluggage<br>Recirculation Flow meter Malfunction<br>Emissions Minimization Steps<br>If the scrubber recirculation flow cannot be restored to normal flow in a timely manner, suspend Recovery Furnace liquor firing until repairs can be made. | <br>S<br>S<br>O |

| Event | Malfunctions and Emissions Minimization Steps | Operational Effect** |
|---|---|---|
| Scrubber ΔP and Flow Monitoring System Malfunction | <u>Malfunctions</u><br>DCS System Malfunction<br>Instrument Loop Malfunction<br>Recirc. flow meter Calibration Failure<br><u>Emissions Minimization Steps</u><br>Continue to operate the Recovery Furnace and smelt scrubber as it was operating before the malfunction of the Instrument loop or DCS system occurred, as long as the boiler and Smelt scrubber are operational. Take maintenance action to repair the instrument, meter, or DCS as soon as possible. | <br>O<br>O<br>O |

<u>Note</u>

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"B" indicates the malfunction or device can be verified and corrected while the source is operational, but the malfunctioning device must be bypassed and/or isolated.

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Stone Container Corporation
Panama City Mill

No. 1 and No. 2 Smelt Dissolving Tank Scrubbers - Maintenance Checklist

**Monthly**

1. Conduct vibration analysis on scrubber fan bearings

**Annual Outage**

1. Inspect spray nozzles for buildup and condition
2. Inspect duct work
3. High pressure wash the fan and the inside of the scrubber
4. Conduct non-destructive testing on fan blades
5. Calibrate flowmeters and d/p cell

# LIME KILN AND KILN SCRUBBER SYSTEM

## MACT II
## STARTUP & EMISSIONS MINIMIZATION CHECKLIST

Below are excerpts from the standard operating procedures that are to be followed to minimize particulate emissions during the startup of the Lime Kiln and Lime Kiln Scrubber system and a checklist for the minimization of emissions during the system startup period. The Lime Kiln should be fully operational and the scrubber recirculating flows and venturi differential pressure within normal startup ranges prior to introduction of Lime Mud into the Kiln.

Verification of Startup Conditions

The Lime Kiln startup period is defined and beginning when dewatered lime mud is feed to the kiln at a sustainable. The Lime Kiln startup period ends and operation begin when the kiln is producing reburned lime (when bucket elevator operation is required). The following conditions must be verified prior to introducing lime mud into the Kiln:

- Is the front-end and burner operation stable and is the flame safety system engaged and has the system verified that all permissives have been met?
- Is the lime mud washing and precoat filter system operating?
- Is the Lime Kiln combustion system and I.D. fan operation stable and balanced?

Startup Emissions Minimization Checklist

- Is the scrubber $\Delta P$ within the normal range expected prior to lime mud addition?
- Is the scrubber recirculation flows (Bull and Tangential) within normal limits?
- Begin lime mud flow to the Kiln, gradually increase the lime mud flow to normal production levels while maintaining the sufficient scrubber $\Delta P$ and the scrubber recirculating flows to avoid established limit excursions.

# LIME KILN AND KILN SCRUBBER SYSTEM

## MACT II
## SHUTDOWN & EMISSIONS MINIMIZATION CHECKLIST

Below are excerpts from the standard operating procedures that are to be followed to minimize particulate emissions during the shutdown of the Lime Kiln and Lime Kiln Scrubber system and a checklist for the minimization of emissions during the system shutdown period. The operator should maintain scrubber recirculating flows and venturi differential pressure during the Kiln shutdown period.

Verification of Shutdown Conditions

Lime Kiln shutdown period begins when lime mud flow falls below 30 gpm for a period of 30 minutes and ends when the mud flow is zero and the reburned lime bucket elevator is off for more than 30 minutes. The following conditions must be verified prior to the Kiln shutdown:

- Is the scrubber $\Delta P$ within the range expected prior to shutdown?
- Is the scrubber recirculation flows within normal limits?

Shutdown Emissions Minimization Checklist

Begin reducing lime mud flow to the Kiln, gradually decrease the lime mud flow while maintaining the scrubber recirculating flows and the sufficient scrubber $\Delta P$ to avoid established limit excursions. The scrubber recirculating flow should the maintained and the scrubber $\Delta P$ operated as high as possible until lime is no longer entering or leaving the kiln and the reburned lime bucket elevator is no longer needed.

# LIME KILN SCRUBBER

## MACT II
## MALFUNCTION & EMISSIONS MINIMIZATION CHECKLIST

Below is a description of the various malfunctions and associated operational events for the Lime Kiln Scrubber system with the corresponding particulate emissions minimization information. These malfunctions and events include such issues as safety interlocks, process alarms, and equipment failures. The malfunctions listed are those that would likely cause excess particulate emissions.

| **Event** | **Malfunctions and Emissions Minimization Steps** | **Operational Effect**** |
|---|---|---|
| Kiln Scrubber ΔP Range Excursion | Malfunctions | |
| | I.D. fan Failure | O |
| | Venturi Pluggage | S |
| | High Mud Flows | O |
| | Kiln Dusting or poor Mud Washing | O |
| | Kiln Combustion System Malfunction | O |
| | Scrubber Differential Gauge Malfunction | O |
| | Emissions Minimization Steps | |
| | If the scrubber pressure differential range cannot be maintained, lime mud flow should be reduced until the proper ΔP can be restored. If the ΔP cannot be restored in a timely manner, suspend mud flow until repairs can be made. | |
| Kiln Scrubber Recirculation Flow Excursion | Malfunctions | |
| | Recirculation Pump Malfunction | S |
| | Scrubber Nozzle Pluggage | S |
| | Recirculation Flow meter(s) Malfunction | O |
| | Emissions Minimization Steps | |
| | If the scrubber recirculation flow cannot be restored to normal flow in a timely manner, suspend mud flow until repairs can be made. | |

| **Event** | **Malfunctions and Emissions Minimization Steps** | **Operational Effect**** |
|---|---|---|
| Scrubber ΔP and Flow Monitoring System Malfunction | <u>Malfunctions</u><br>Instrument Loop Malfunction<br>Bull/Tan. flow meter Calibration Failure<br><u>Emissions Minimization Steps</u><br>Continue to operate the Kiln and scrubber as it was operating before the malfunction of the Instrument loop occurred, as long as the both Kiln and scrubber are operational. Take maintenance action to repair the instrument or meter as soon as possible. | <br>O<br>O<br>O |

<u>Note</u>

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Stone Container Corporation
Panama City Mill

Lime Kiln - Maintenance Checklist

**As Needed**

1. Rod out differential pressure transmitter sensor openings to break away any encrusted build up in the sensor port

**Monthly**

1. Lubricate two I.D. fan bearings

**Annual outages**

1. Clean stack to remove any buildup
2. Inspect scrubber nozzles and venturi
3. Verify that scrubber interlocks function as designed.

**Continuously**

1. Monitor Fan Vibration

3/10/04