



AbitibiBowater - Calhoun Operations Process Safety Management

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PROCESS SAFETY MANAGEMENT POLICY

I. Purpose

The purpose of this policy is to prevent or minimize the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. These releases may result in toxic, fire or explosion hazards. This policy describes AbitibiBowater's compliance with OSHA regulation 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals.

II. Scope

This policy applies to all mill and contractor employees, while working during normal work hours or shutdowns.

III. Abbreviations Defined

HAZCOM	Hazard Communication
HAZOP	Hazard and Operability Study
LVHC	Low volume high concentration non-condensable gases
MMIS	Materials and Maintenance Information System
MSDS	Materials Safety Data Sheet
NCG	Non-condensable Gases
PHA	Process Hazard Analysis
PSM	Process Safety Management
PSSR	Pre-startup Safety Review
P&ID	Piping and Instrument drawing

IV. Policy

It is the policy of AbitibiBowater to comply fully with OSHA regulation 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals.

A. Covered Hazardous Chemicals

Hazardous or flammable chemicals covered by PSM at AbitibiBowater – Calhoun include the following:

1. Chlorine
2. Chlorine Dioxide
3. Methanol
4. Sodium chlorate solution
5. Sulfuric Acid (93%)
6. Turpentine (Kraft Mill and TMP systems)
7. Non-condensable flammable off-gases (NCG's)

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MSDS for each of these chemicals can be found on the Calhoun Intranet. Paper copies of each MSDS are kept in the Technical Department office.

Deleted: are located in each covered department as well as in Health Services and Safety office

B. Covered Processes

Processes involving these chemicals are described in the “Process Safety Management Covered Processes” section of this policy. Definitions of policy terminology are listed in Section III above.

C. Process Safety Management Covered Processes

The following chemicals are covered under Process Safety Management for the Calhoun Operations as specified by the Tennessee Occupational Safety and Health regulation 29 CFR 1910.119.

Primary Departments having Process Safety Management covered processes are the Kraft Mill and Power House. Other specific departmental areas include the Technical Department (Environmental) Sewage Treatment Plant and Thermo Mechanical Pulping (TMP) turpentine storage.

PSM COVERED CHEMICAL	LOCATION	DESCRIPTION/ QUANTITY
Chlorine	Filter Plant	5 - One Ton cylinders
Chlorine Dioxide	ClO ₂ Plant	1 - 40 Ton generator 2 - 225,000 gallon storage tanks
Methanol	ClO ₂ Plant	1 - 10,000 gallon storage tank
Sodium Chlorate	Chem Prep	1 - 22,000 gallon unloading tank 1 - 30,000 gallon storage tank 1 - 55,000 gallon storage tank
Sulfuric Acid (93%)	ClO ₂ Plant	1 – 27,000 gallon storage tank
Turpentine	Kraft Mill	1 – 3,500 gallon collection (day) tank 1 – 29,890 gallon storage tank
	TMP	1 - 734 gallon collection (day) tank 1 – 29,890 gallon storage tank
Non-Condensable Gases (Hydrogen sulfide, methyl mercaptan, dimethyl sulfide, dimethyl disulfide)	Kraft Mill and Utilities (#3 Recovery Boiler)	Process lines - variable Evaporators & Relief System - variable

V. Procedures

A. Employee Participation

When the Process Safety Management (PSM) standard became effective, AbitibiBowater – Calhoun Operations developed a committee made up of hourly and supervisory employees. This committee implemented a written plan to address each of the 14 key elements of PSM. This manual is the foundation and procedure from that effort

At a minimum, hourly employees are involved and participate in Process Hazard Analysis (PHA), Incident Investigations, and Management of Change. In addition, any employee or on-site contractor has access to PHA and Process Safety Information in the Engineering office – drawing and file area.

Hourly employees participate in the development of Process Operating Procedures and Maintenance Procedures as outlined in section (f) of the OSHA standard. Revisions to Operating Procedures will be reviewed by at least one qualified operator for the covered process area.

B. Process Safety Information

Process safety information is compiled before each process hazard analysis. This information enables AbitibiBowater and its employees to identify and understand the hazards posed by the processes involving these chemicals. Process safety information includes the following:

1. Information pertaining to the hazards of the highly hazardous chemicals in the process is found in the AbitibiBowater HAZCOM data for each chemical. Information pertaining to the hazardous chemicals includes toxicity information, permissible exposure limits, physical data, reactivity data, corrosivity data, thermal and chemical stability data, and hazardous effects of inadvertent mixing. These HAZCOM data sheets are available on the Calhoun intranet Safety website.
2. Safety information is collected from various sources such as –but not limited to– American Conference of Governmental Industrial Hygienists, National Institute of Occupational Safety and Health, and OSHA Air Contaminants Subpart Z. This information will be reviewed during Process Hazard Analysis reviews and incorporated into employee awareness material for general knowledge.
3. See PHA “Kickoff Meeting Checklist” for information pertaining to the technology of process safety information to be reviewed.
4. Information pertaining to the process equipment are on file in Mill Engineering offices. The Mechanical Integrity Program (a separate document) describes the equipment and the Mechanical Integrity program.
5. AbitibiBowater documents that equipment complies with good engineering practices. Equipment specifications and performance curves are filed by equipment number in the EMPAC database; equipment data is filed by equipment number in Mill Engineering.
6. For equipment designed and constructed in accordance with codes that are no longer in general use, AbitibiBowater documents that the equipment is designed, maintained, inspected, tested and operating in a safe manner.

C. Process Hazard Analysis

Process hazard analyses (PHA's) are performed on the processes covered by this standard. PHA's identify, evaluate, and control the hazards involved in the processes.

1. PHA procedures and forms used are found on the following pages.
2. PHA's are updated and revalidated at least every 5 years based on their completion date. A history of PHA's completed is in the reference document "PHA List by Covered Process". Revalidation dates for PHA's are shown in the reference "PSM Periodic Tasks".
3. The methodologies used for PHA's are Hazard and Operability Study (HAZOP) and/or "What-If".
4. PHA's must address the hazards of the process and the identification of any previous incident which had a likely potential for catastrophic consequences in the workplace. Past incident reports are filed with the PHA in the Engineering File Room or may be in the on-line Incident Reporting System.
5. PHA's must address engineering and administrative controls applicable to the hazards such as detection methodologies to provide early warning of releases and Operating Procedures.
6. PHA's must address the consequences of failure of engineering and administrative controls, facility siting, human factors, and a qualitative evaluation of a range of the possible safety and health effects of failure of controls on employees in the workplace. "Human Factor, Facility Siting, and Operating Procedures" are documented in attached forms.
7. PHA's must be performed by teams with expertise in engineering and process operations, including at least one employee who has experience and knowledge specific to the process being evaluated, one operating hourly employee, a member from Maintenance, Technical, Safety, and one member knowledgeable in the HAZOP and/or "What-If" methodology.
8. A system has been established to promptly address the team's action items and recommendations. The recommendations must be resolved in a timely manner and the resolution of each must be documented. Recommendations are approved or rejected by the operations area manager. Approved recommendations become action items, and are prioritized (1, 2, or 3) using a risk analysis procedure described in "Procedure for Setting Priorities". Priority 1 action items (as defined in the Procedure) are to be completed within 30 days. Priority 2 items are to be completed within 90 days. Priority 3 items are to be completed in 6-12 months. Rejected recommendations are retained in the PHA file, documenting discussion of the issue.

The area manager is responsible for ensuring that each action item gets completed. The PSM Coordinator develops a written schedule for completing the action items, tracks the items and maintains the Action Item Master List. This Master List is used to track action items from PHA's, Management of Change reviews, and Incident Investigations. The PSM Coordinator periodically reminds operations of the status of action items.

When an action item is completed, the person assigned responsibility for it notifies the PSM Coordinator. The area manager is responsible for communicating completion of the item to operating, maintenance and other employees whose work assignments are in the process and who may be affected by the action item.

Senior management periodically reviews the status of PHA action items. The PSM Coordinator schedules and coordinates this meeting.

9. At least every 5 years after the completion of the initial PHA, the PHA is updated and revalidated by a team meeting the requirements in paragraph 7 above. A tracking system summary – PSM Periodic Tasks (not included in this document)--shows due dates for the PHA revalidations and other

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periodic tasks. The Operating Department manager is responsible for scheduling, conducting, and coordinating the PHA.

10. AbitibiBowater retains original and revalidation PHA's for each process covered, as well as the documented resolution of recommendations made, for the life of the process. These documents are retained in the Mill Engineering files (paper copies) and on computer files. P&ID's and engineering drawings for covered processes are maintained in Mill Engineering files.

PROCEDURAL STEPS FOR PROCESS HAZARD ANALYSIS	RESPONSIBILITY
1. Appoint Project Team Leader.	PSM Coordinator
2. Identify and select Team Members, to include Engineering, Operators, Operating Department Supervision, Maintenance, Technical / Environmental, and Safety & Health.	HAZOP Team Leader
3. Conduct Kickoff Meeting to review scope, boundaries, information required, assign responsibilities. Required Process Safety Information is shown on "PHA Kickoff Meeting Checklist" Set date for HAZOP	HAZOP Team Leader makes assignments
4. Conduct Process Hazard Analysis using HAZOP Methodology.	HAZOP Team
5. Review Recommendations with area Manager, approve or reject. Prioritize approved Action Items: 1 – to be completed within 30 days 2 – to be completed within 90 days 3 – to be completed in 6 to 12 months	HAZOP Team and Area Manager
6. Record prioritized Action Item list and send to area Managers.	PSM Coordinator
7. Implement Action Items.	Department Manager
8. Track Action items on PHA Action Item Master List, send reminders to Department Managers periodically. Record completion dates of items.	PSM Coordinator
9. Report status of Action Items to senior management periodically until all action items are complete.	Department Manager and PSM Coordinator

PHA KICKOFF MEETING CHECKLIST

PHA Kickoff meeting for _____

Date and Time: _____

Place: _____

Agenda: Make assignments for the 7 steps in the table below.

1. PHA Team	Names: Assignments made
PHA Leader	
Engineering	
Engineering-EI	
Engineering-Mech	
Operations Supervisor	
Operator	
Maintenance	
Technical / Environmental	
Safety	
Scope of PHA: Hazard and Operability Study (HAZOP) : (Describe system)	
3. Boundaries:	
4. Process Safety Information	Responsibility
<input type="checkbox"/> MSDS	Tech Services
<input type="checkbox"/> Block flow diagram	
<input type="checkbox"/> Process chemistry	
<input type="checkbox"/> Maximum intended inventory	Operations
<input type="checkbox"/> Safe upper and lower limits for temps, pressures, flows, etc.	Operations
<input type="checkbox"/> Evaluation of the consequences of deviations	Operations
<input type="checkbox"/> Equipment materials of construction	Engineering
<input type="checkbox"/> P&ID's	Engineering
<input type="checkbox"/> Electrical classification	Engineering
<input type="checkbox"/> Relief system design and design basis	Engineering
<input type="checkbox"/> Ventilation system design	Engineering
<input type="checkbox"/> Design codes and standards	Engineering
<input type="checkbox"/> Material and energy balances	
<input type="checkbox"/> Safety systems (interlocks, detection or suppression systems, etc.)	Automation Systems
<input type="checkbox"/> Equipment designed to codes no longer in general use, document that equipment is designed, maintained, inspected, tested and operated in a safe manner.	Engineering
5. Required for PHA – assign responsibilities at kickoff	Responsibility
<input type="checkbox"/> Address process hazards	PHA Team during HAZOP's

<input type="checkbox"/> Injury and incident reports relative to the PHA.	Safety
<input type="checkbox"/> Engineering and administrative controls, eg. gas monitors, process alarms, written procedures, etc.	PHA Team during HAZOP's
<input type="checkbox"/> Consequences of failure of engineering and admin. controls. For example, if alarms don't work and/or procedures are not followed	PHA Team during HAZOP's
<input type="checkbox"/> Facility siting	Operations
<input type="checkbox"/> Human factors	Operations
<input type="checkbox"/> Evaluation of a range of possible safety and health effects of failure of controls on employees	PHA Team during HAZOP's
<p>6. Operating Procedures. Operating department will verify that all elements listed below are present in the current operating procedures. PSM Coordinator verify.</p>	
<input type="checkbox"/> Steps for <u>initial</u> startup and startup after a <u>turnaround</u> , or <u>emergency</u> shutdown. Define each underlined term.	<input type="checkbox"/> Steps required to correct or avoid deviation from operating limits <input type="checkbox"/> Use of portable gas monitors (if applicable)
<input type="checkbox"/> Steps for normal operation. Define "normal operation".	<input type="checkbox"/> Properties and hazards of process chemicals <input type="checkbox"/> Safety & Health considerations for each mode <input type="checkbox"/> Any special or unique hazard
<input type="checkbox"/> Steps for temporary operation. Define "temporary operation".	<input type="checkbox"/> Precautions to prevent exposure (engineering controls, gas monitors, administrative controls, PPE, etc.)
<input type="checkbox"/> Steps for emergency shutdown, including conditions for emergency and assignment of responsibility to qualified operators	<input type="checkbox"/> Control measures if contact occurs (physical or airborne), for example, escape respirators and/or safety showers
<input type="checkbox"/> Steps for emergency operations, as defined above.	<input type="checkbox"/> Quality control for raw materials
<input type="checkbox"/> Steps for normal shutdown. Define "normal shutdown".	<input type="checkbox"/> Control of hazardous chemical inventory levels. <input type="checkbox"/> Safety systems and their functions.
<input type="checkbox"/> Consequences of deviating from operating limits (temp, pressure, conc.)	<input type="checkbox"/> Operating Procedures are current and accurate.
<p>7. Set date for HAZOP</p>	

PROCEDURE FOR SETTING PRIORITIES

For Action Items from PHA, MoC, Incident Investigation and Compliance Audit

1. Team reach consensus on the FREQUENCY that the effect might occur if the action item is not completed. Refer to the "PSM Action Item Priority Scale" chart. The potential frequency will be one of the following (as defined on the Priority Scale chart): Rare, Possible, Probable, Occasional, Frequent, Very Frequent or Continuous.
2. Team reach consensus on the SEVERITY of the potential effect of not completing the action item. Refer to "Risk Matrix for Analysis" chart. Severity will be Minor, Moderate, Significant, Major or Catastrophic for each of these categories: Safety, Environmental, Economic, Production and Quality. The action item may be different severity for the five categories.
3. Determine the RISK for each of the five categories (see step 1) of not completing the action item by using the "PSM Action Item Priority Scale" and "Consequence Table". The highest priority (i.e. lowest number) of all the categories will determine the priority for the action item. For example, if the action item is judged a frequency of Probable, and the severity as show in the table below, then the PRIORITY would be as shown.

CATEGORY	SEVERTY OF EACH CATEGORY	PRIORITY OF EACH CATEGORY	PRIORITY FOR THE ACTION ITEM
Safety	Significant	2	2 (complete within 90 days)
Environment	Major	2	
Economic	Moderate	3	
Production	Minor	3	
Quality	Minor	3	

4. The priority derived from the Priority Scale chart determines the target date. Priority 1 items are to be completed within 30 days; priority 2 items within 90 days, and priority 3 items 6-12 months.

Risk Matrix for Analysis—Action Item Priorities

Severity of Effect	Safety	Environmental	Economic	Production	Quality
Catastrophic Average Severity = \$2,000,000	An injury or illness that results in a one or more fatalities or permanent total disabilities.	Major offsite impact resulting in injuries and / or evacuations.	The cost of property damage is \$1,000,000 or more. Costs are more than \$1,000,000 above budget or plan.	Shutdown of the entire mill for more than 24 hours. Production loss in excess of 2500 tons. Significant management and stakeholder attention.	Loss of Customer.
Major Average Severity = \$500,000	Any injury or illness results in permanent partial disability. Multiple lost time injuries.	Major local area / offsite impact (waterway life effects or offsite health effects).	The cost of property damage is \$250,00 or more, but less than \$1,000,000. Costs are above budget by \$250,000 or more, but less than \$1,000,000.	Shutdown of the entire mill up to 24 hours. Production loss of 200 tons or more, but less than 2500 tons.	Threat of the loss of customer.
Significant Average Severity = \$125,000	A lost time work injury or illness. Multiple OSHA recordable injuries.	Significant local area / offsite impact (enough for community alert or awareness)	The cost of property damage is \$100,000 or more, but less than \$250,000. Costs are above budget by \$100,000 or more, but less than \$250,000.	Shutdown of an entire process line with curtailment of final product. Production loss of 20 tons or more, but less than 200 tons.	Multiple rejections by a customer.
Moderate Average Severity = \$25,000	An OSHA recordable injury or illness. Multiple first aid injuries.	Significant local area / offsite impact (any reportable event)	The cost of property damage is \$10,00 or more, but less than \$100,000. Costs are above budget by \$10,000 or more, but less than \$100,000.	Moderate impact on ability to maintain production. Production loss of 5 tons or more, but less than 20 tons.	Rejection of our product by a customer.
Minor Average Severity = \$2,000	A first aid injury. A near-miss incident.	Release of substance with minor / no offsite effects. Possible personnel exposure.	The cost of property damage is less than \$10,000. Costs are above the budget or plan by \$10,000 or less.	Minor impact on ability to maintain production. Production loss of less than 5 tons.	Generation of a customer complaint.

PSM ACTION ITEM PRIORITY SCALE
RISK = FREQUENCY x CONSEQUENCE

FREQUENCY

Continuous From 100 to 1000 events per year	1	1	1	1	1
Very Frequent From 10 to 100 events per year	2	1	1	1	1
Frequent From 1 to 10 events per year	2	2	1	1	1
Occasional From 1 event / year to 1 event every 3 years	3	2	2	2	1
Probable From 1 event every 3 years to 1 event every 10 years	3	3	2	2	1
Possible From 1 event every 10 years to 1 event every 50 years	3	3	3	3	2
Rare From 1 event every 50 years to 1 event in the life time of the plant	3	3	3	3	3
	Minor	Moderate	Significant	Major	Catastrophic

CONSEQUENCE

PRIORITY SCALE	DESCRIPTION	COMPLETION SCHEDULE
1	Critical and urgent	Within 30 days
2	Serious—could cause harm or property damage	Within 90 days
3	Needed to improve safety and health	6-12 months

PROCESS HAZARD REVIEW MEETING NOTES

TITLE:

Boundaries:

Drawings:

PARTICIPANTS:

MEETING NOTES: Health and Safety issues

PERSON	DISCUSSION	ACTION ITEM #

PROCESS HAZARD ANALYSIS WORK SHEET

PROCESS: _____ Date: _____

Boundaries:

REFERENCE DRAWINGS:

Prepared by:

ITEM #	DEVIATION From Normal	POSSIBLE CAUSES of the Deviations	CONSEQUENCES of Failure of Engineering and Administrative Controls and possible safety and health effects on employees	SAFEGUARDS — Engineering and Administrative Controls	ACTION ITEMS Additional Safeguards Needed
1.1	What if FLOW is high				
1.2	low				
1.3	no flow				
1.4	wrong? (leaks?)				
1.5	reverse?				
1.6	contaminated?				
2.1	What if PRESSURE is high?				
2.2	low (too much vacuum)?				
3.1	What if TEMP is high?				
3.2	low?				
4.1	What if LEVEL gets high?				

4.2	low?				
ITEM #	DEVIATION	CAUSES	CONSEQUENCES	SAFEGUARDS —Engineering & Administrative Controls	ACTION ITEMS
5.1	(Other factors relevant to specific equipment)				
6.1	What if Operating Procedures are not adequate?				
6.2	What if Training is not adequate				
6.3	What if Contractor Training is not adequate?				
6.4	What if there is insufficient Emergency Response planning and response?				

ITEM #	DEVIATION	CAUSES	CONSEQUENCES	SAFEGUARDS —Engineering & Administrative Controls	ACTION ITEMS
7.1	Situations related to Start-up				
7.2	Shutdown Isolate for Maintenance: <ul style="list-style-type: none"> ▪ Lockout lists ▪ PPE while draining ▪ Monitor atmosphere ▪ Respiratory protection ▪ I.D. contents of tanks ▪ 				
7.3	Maintenance				
7.4	Sampling				

ITEM #	DEVIATION	CAUSES	CONSEQUENCES	SAFEGUARDS —Engineering & Administrative Controls	ACTION ITEMS
8.1	KEY WORDS - refer to complete list, with these headings:				
	Utilities				
	Equipment Failure				
	Special Situations				
	Special Upsets				
	Fire Hazards				
	Operations				
	PPE				

Critical Safety Equipment is defined as any equipment, system or sub-system of an operating area designed to safeguard personnel from serious injury, or to prevent equipment or process failures that can result in a catastrophic incident or significant property damage on or off AbitibiBowater - Calhoun mill property. This form is used at the PHA meeting to identify such equipment.

CRITICAL SAFETY EQUIPMENT

Device	Location	Set Point	Failure History	Frequency of check	Comments

KEY WORD REMINDER LIST

UTILITY FAILURE

- Instrument (air, electrical, mechanical)
- Electricity
- Water (freeze, break, pump failure, etc.)
- Steam (failure or full flow)
- Process air
- Cooling
- Heating
- Vacuum (air leakage, etc.)
- Inert gas
- Leaks, both in and out
- Materials of construction (corrosion, gaskets, etc.)

EQUIPMENT FAILURE

- Relief devices, open vents
- Agitation
- Valves (fail open, plugged, etc.)
- Pumps (seal leaks, etc.)
- Grounding (static buildup)
- Venting system
- Venting system
- Easy access to emergency valves & switches
- Adequate pressure rating
- Concrete bulkheads, barricades, dikes
- Pressure vessels (codes, inspection)
- History of vessel

FIRE HAZARDS

- Fire in cable trays
- Explosion suppression equipment
- Sprinkler system needed; fire extinguisher, hose reels, hydrants
- Adequate drainage provided for fire fighting
- Location of fire alarms
- Fire walls

OPERATIONS

- Written operating procedures (validated, updated, etc.)
- Operating personnel trained
- Special cleanup requirements before startup
- Proper maintenance (relief valves, rupture discs, vacuum breakers)

SPECIAL SITUATIONS

- Areas potentially impacting on neighbors
- Potential for fire within plant
- Potential for toxic exposures in plant
- Spills
- Maintenance, layouts for access and removal
- Winterizing, freeze-ups, crystallization
- Sampling (accessibility, plugging)
- Vessel entry (24" manways, air supply, blinding)
- Decontamination (purging)
- Government regulations EPA/OSHA
- Solid waste disposal - eliminate/define disposal
- Noise, odors
- Adequate piping support and flexibility
- Provision for flushing out piping
- Proper drain connections
-

SPECIAL UPSETS

- High pressure - relief location, discharge points, emergency venting
- High temperature - explosions, fire, sun heat
- Reactants - wrong material, added at wrong stage
- Thunderstorms - lightning, flooding
- Tornado, Earthquake - wind loads, flooding
- Airplane crash; large crane mishaps, runaway truck
- Extreme continued low temperature, deep snows
- Momentary power loss - what will and won't restart

ISOLATING EQUIPMENT FOR MAINTENANCE

- Identify contents of tanks
- Drain safely
- PPE while draining
- Flush out Linebreaking permit
- Hot work
- Respiratory protection
- Air monitoring while draining
- Lockout lists
- Confined space permit

PERSONAL PROTECTIVE EQUIPMENT

- Protective clothing (gloves, coveralls, safety shoes, etc.)
- Eye protection (safety glasses, face shield, goggles)
- Respiratory protection (negative pressure respirator, SCBA, airline, escape)

Human factors and facility siting must be considered during the PHA. Human factors are assessed by interviewing one or more operators using the questionnaire below. Deficiencies identified are discussed at the PHA meeting and addressed as action items.

Facility siting methodology – assessment of the hazards associated with location of process plant buildings – is described in a separate document “PHA – Procedure for Facility Siting Analysis”.

PHA HUMAN FACTOR & FACILITY SITING QUESTIONNAIRE

PHA ID: _____ TITLE: _____ DATE: _____ Prepared By: _____

GENERAL WORK ENVIRONMENT

ITEM	QUESTION	RESPONSE	COMMENTS
1	Is atmospheric temperature normally within comfortable bounds?		
2	Is noise maintained at a tolerable level?		
3	Is the lighting sufficient for all facility operations?		
4	Have postures, movement and accessibility been considered for both operations and maintenance activities?		

ACCESSIBILITY/AVAILABILITY OF CONTROLS & EQUIPMENT

ITEM	QUESTION	RESPONSE	COMMENTS
5	Are adequate supplies of protective gear readily available for routine & emergency use?		
6	Is communications equipment adequate & accessible?		
7	Is there adequate access for routine operation and maintenance of all equipment?		
8	Are all controls accessible?		

COMPONENT LABELING

ITEM	QUESTION	RESPONSE	COMMENTS
9	Are all important equipment (vessels, pipes, valves, instruments, controls, etc.) clearly labeled?		
10	Do equipment and valve labels match those in the operating procedures?		
11	Are instruments & controls clearly labeled?		

FEEDBACK/DISPLAYS

ITEM	QUESTION	RESPONSE	COMMENTS
12	Is adequate information about normal and upset conditions displayed in the control room?		
13	Are controls & displays arranged logically to		

	match the expectations of the operators?		
14	Are displays adequately visible from all relevant working positions?		
15	Are operators provided with enough information to diagnose an upset when an alarm sounds?		
16	Are alarms displayed by priority? Are critical Safety alarms separate from control alarms?		
17	Do the displays provide an adequate view of the entire process as well as essential details of individual systems?		
18	Do the displays give rapid feedback for all operational actions?		

CONTROLS

ITEM	QUESTION	RESPONSE	COMMENTS
19	Do the control panel layouts reflect the functional aspects of the process/equipment?		
20	Does the control arrangement logically follow the normal sequence of operation?		
21	Are critical controls operated in the same manner (e.g. up-down; push-pull)?		
22	Are any process variables difficult to control with the existing equipment?		
23	Does the control logic seem adequate?		
24	Is there a dedicated Emergency Shut Down panel and where is it located?		

WORKLOAD & STRESS FACTORS

ITEM	QUESTION	RESPONSE	COMMENTS
25	Are operators only in the control room or do they do other things?		
26	How many manual adjustments must a worker perform during normal & emergency operations?		
27	Has the operator's individual responsibility been clearly defined?		

TRAINING AND GENERAL ISSUES

ITEM	QUESTION	RESPONSE	COMMENTS
28	Has each process operator been trained in an overview of the process and operating procedures?		
29	Did operator training emphasize specific safety and health hazards, emergency operations, and safe work practices?		
30	What means are provided to allow operators to recover from errors?		
31	Have the operators made suggestions for improvements to the displays, controls, or		

	equipment to better suit their needs?		
32	Have training modules and methods been developed?		
33	Does training include hands-on exercises?		

OPERATING PROCEDURES

ITEM	QUESTION	RESPONSE	COMMENTS
34	Have Operating Procedures been developed and implemented that cover clear instructions for safely operating the process, consistent with the process safety information from the PHA?		
35	Are procedures clear and complete and easy to use?		
36	Have operators been involved in developing and/or reviewing the procedures?		
37	Do the operating procedures address: Steps for startup?		
38	Steps for Normal operations?		
39	Steps for Temporary operations, including a description of the temporary conditions?		
40	Steps for Emergency shutdown, including conditions?		
41	Steps for Normal shutdown?		
42	Steps for Startup following a turnaround or after an emergency shutdown?		
43	.Do the procedures address operating limits for this process?		
44	Consequences of deviation from these limits?		
45	Steps to correct or avoid deviation?		
46	Do the operating procedures address safety and health considerations: Properties of and hazards presented by chemicals in the process?		
47	Precautions necessary to prevent exposure, including engineering controls (alarms, etc.) administrative controls (safety rules, etc.) and PPE?		
48	Control measures to be taken if physical contact or airborne exposure occurs?		
49	Quality control for raw materials?		
50	Control of hazardous chemical inventory levels?		
51	Do Operating Procedures address any special or unique hazards?		
52	Do the Operating Procedures describe safety		

	systems (interlocks, detection systems, etc.) and their functions?		
53	Are the Operating Procedures readily accessible to operators and maintenance Technicians?		
54	Are the Operating Procedures reviewed as often as necessary so that they are currently correct? When were they last reviewed?		
55	How does the department manager certify annually that the Operating Procedures are current and accurate?		

WORST-CASE SCENARIO

ITEM	QUESTION	RESPONSE	COMMENTS
56	What is the worst-case scenario involving hazardous chemicals in this process?		
57	What would be the effects on-site?		
58	What would be the effects off-site?		

PROCESS HAZARD ANALYSES -- LIST BY COVERED PROCESS

PROCESS	CODE	DATE	PROCESS BOUNDARIES
LVHC and SOG			LVHC: From sources (turpentine cooler, RB3 evaps & stripper feed tank) to incineration point (incinerator or kiln). SOG: From stripper feed tank pump-out through stripper to incinerator.
1st STAGE BLEACH (D100)			ClO ₂ piping from main line to D100 mixer, D100 tower, washer, filtrate & scrubbing system. (Cl ₂ Vaporizer removed August 2000). 1 st stage bleaching was combined with 2 nd stage for subsequent PHA's.
ClO₂ PLANT CHEMICALS			From unloading (sulfuric acid, methanol and sodium chlorate), through storage & delivery to generator. Does not include acid pump and pipe to bleach plant.

CIO₂ GENERATOR & PLANT

Generator, gas-off system, absorption tower to storage tanks to suction of product pumps, including scrubber to discharge. Salt cake filter--not including wash water-- to slurry tank.

2nd STAGE BLEACH (D), INCL. DELIVERY

From ClO₂ solution pumps through solution heater to D100 mixer and D mixer, D tower, washer, filtrate & scrubbers.

Since 3/1/01 the PHA boundaries for bleach plant includes both D100 and D systems, including towers, washers, filtrate and scrubbers.

TURPENTINE

KM: From inlet to decanter to day tank to storage tank, including loading (rail & truck).

TMP: From condenser inlets (2 units) to decanters (2) to day tank to storage tank, including temp. truck loading..

FILTER PLANT C12

Unloading of ton containers to chlorinated water pipe to pre-mixing basin and after-mixing basin.

D. Operating Procedures

AbitibiBowater has developed and implemented written operating procedures that provide clear instructions for safely conducting activities involved in each covered process. Experienced operators (Subject Matter Experts or SME's) systematically develop and maintain operating procedures for each of the covered process areas. These Operating Procedures are used for training and reference and are certified correct annually by the Operating Superintendent. Operating procedures are located on electronic access and/or paper copies in departments involved.

1. These operating procedures address the following elements: steps for each operating phase, initial startup, normal operations, temporary operations, emergency shutdown, emergency operations, normal shutdown, and startup following a turnaround or after an emergency shutdown.
2. Operating procedures address operating limits, consequences of deviation, and steps required to correct or avoid deviation.
3. Operating procedures address safety and health considerations, including properties of, and hazards presented by, the chemicals used in the process (described in "Hazard Communication Program"). Also precautions necessary to prevent exposure, including engineering controls, administrative controls, and personal protective equipment (described in the "Personal Protective Equipment Policy" found on the Calhoun Safety intranet).

Engineering controls include stationary gas monitors for chlorine, chlorine dioxide, and hydrogen sulfide, placed at several locations within PSM covered processes.

Administrative controls referenced in operating procedures include checklists for isolating process equipment for maintenance (lockout checklists), and warning and caution notes in the procedures.

4. Control measures to be taken if contact occurs are included in or referenced in the operating procedures. Quality control for raw materials and control of hazardous chemical inventory levels are also addressed. In addition, any special or unique hazards are addressed.
5. Safety systems and their functions – such as interlocks – are addressed in the operating procedures.
6. Operating procedures are readily accessible to employees who work in or maintain a PSM covered process. Current Operating Procedures are available in the department, and may be in both printed and/or electronic versions.
7. The operating procedures are reviewed and certified by department management as often as necessary to assure that they reflect current operating practice, including changes that result from changes in the process chemicals, technology, and equipment and facilities. The "Operating Procedures Certification" form is included in this section.
8. AbitibiBowater develops and implements safe work practices to provide for the control of hazards during operations such as: "Lockout Procedure", "Confined Space Entry", "Linebreaking", "Hot Work", and "Respiratory Protection". These safe work practices apply to mill and contractor employees.

ROLES AND RESPONSIBILITIES

Operating Department Superintendent

The Operating Department Superintendent or his designee shall be responsible for ensuring that the Operating Procedures are reviewed so that they address the requirements of Process Safety Management. The Operating Department Superintendent is also responsible for ensuring that the Operating Procedures are annually reviewed by operations and certified correct.

The Operating Department Superintendent shall be the document controller for the Operating Procedures of the covered processes. Document control includes reviewing, revising, approving, certifying and ensuring that the Operating Procedures are distributed. The Operating Department Superintendent is responsible for documenting changes in processes and operating procedures. Documentation may consist of retaining a dated copy each time the Operating Procedures are revised. Operating Procedures shall be readily accessible to employees who work in or maintain a process.

The Operating Department Superintendent shall be responsible for providing the resources to initially document, update, and annually review and certify the operating procedures. The annual review includes overseeing the revision review, approving procedures, and distributing the revisions. The date of the most recent revision shall be shown on the first page of the Operating Procedures module.

The Operating Department Superintendent shall provide controlled access to the electronic PSM Operating Procedures for all employees. The master copy of the Operating Procedures shall be kept electronically.

Subject Matter Experts

The Subject Matter Experts shall be responsible for gathering, documenting, and revising the Operating Procedures for the covered processes.

PSM Coordinator

The PSM Coordinator or designee shall remind Operating Department Superintendents when required annual Operating Procedure re-certifications are due.

REVISING PROCEDURES

Any employee can request a change in a procedure, subject to approval. Approval will be by the document controller (Department Head) or designee.

Revision numbers will be assigned to the documents. The initial procedure will be Revision 0. Each subsequent revision will be 1, 2, 3, etc. Revision date will accompany the revision number.

Operating Procedures shall be reviewed as often as necessary to assure that they reflect current operating practice. The document controller originates all reviews and revisions; the new revision number and date entered by the document controller signifies approval. New revision numbers will be assigned at each revision.

Process Safety Management

Annual Certification

AbitibiBowater - Calhoun Operations is committed to ensuring that PSM operating procedures are updated to comply with 1910.119(f)(3).

Each Operating Department Superintendent is responsible for having procedures reviewed and updated as often as necessary to reflect current operating practice, including changes resulting from changes to process chemicals, technology, equipment and facilities.

Departments and processes covered under Process Safety Management are:

Kraft Mill	ClO ₂ in bleach plant D100 and D stages, including mixer, tower, washer, filtrate and scrubbers
Kraft Mill	Turpentine day tank, storage, and loading
Kraft Mill	LVHC collection system
Kraft Mill	ClO ₂ Plant and chemical (sulfuric acid, methanol and sodium chlorate) unloading and storage
P&S	Filter Plant chlorine
P&S	LVHC/SOG systems
TMP	Turpentine day tank, storage, and loading

Operating procedures will be annually certified as current and correct by the Operating Department Superintendent or Manager using the attached certification form.

Annual certification signature sheets are kept on file in the Engineering Compliance File Room for a minimum of five (5) years.



Operating Procedures Certification

Pursuant to 29 CFR 1910.119(f)(3), AbitibiBowater, Calhoun Operations, hereby certifies that the operating procedures for Process Safety Management covered processes have been reviewed to assure that they are accurate and reflect current operating practice. Revisions resulting from changes in process chemicals, technology, equipment, and facilities have been incorporated into the current operating procedures.

Covered process area(s): _____

AbitibiBowater - Calhoun Operations

Name: _____

Title: _____

Date: _____

Comments:

E. Training

AbitibiBowater is committed to providing Operator training as often as necessary and not less than every three years for employees who operate PSM covered processes. Training documentation includes a summary sheet which states the employee's name, date(s) of training, means used to verify understanding and refresher training due date. The means used to verify that each employee involved in operating a process has received and understood the training will identify the utilized instruments(s)-- Knowledge Check (written test) and/or Performance Check (demonstration).

The Operating Department Superintendent is responsible for operator training (including refresher training). The Operating Department Superintendent or designee is responsible for maintenance technician training. The Manager of Health and Safety is responsible for contractor safety training.

F. Contractors

When selecting a contractor, AbitibiBowater obtains and evaluates information regarding the contractor's safety performance and programs. AbitibiBowater's Contractor Safety Policy, guidelines for selection, training and evaluation are included on the following pages. Contractor evaluation files are kept in the Safety office.

The Mechanical Integrity program (separate document) describes the steps for quality assurance of contractor work that is not included in the safety evaluation process.

AbitibiBowater informs contract employers of the known potential fire, explosion, or toxic release hazards related to the contractor's work and the process, and explains the applicable provisions of the Emergency Response Plan (ERP). AbitibiBowater has developed and implements safe work practices to control the entrance, presence, and exit of contract employers and contract employees in covered process areas.

The current version of the Contractor Safety Policy is available on the Calhoun Safety intranet site. Included with contractor safety is a separate document called "Summary of Safety, Security, and General Mill Rules for Contractors". Procedures for contractor management, such as the contractor safety questionnaire, evaluation form, and audit form are located on the internet at www.calhouncontractors.com.

G. Pre-startup Safety Review

For new facilities and for modified facilities, AbitibiBowater performs a pre-startup safety review (PSSR).

1. This review confirms that prior to the introduction of highly hazardous chemicals to a process, construction and equipment is in accordance with design; and safety, operating, maintenance and emergency procedures are in place and are adequate.
2. For new facilities, a design review is required before the start of installation, and a PHA is performed and recommendations resolved or implemented before startup. Modified facilities meet the requirements contained in "Management of Change".
3. The following disciplines or departments will be represented at the PSSR: Operations Supervisor, Operator, Engineer, Safety, Maintenance and Contractor (if applicable). The review will include a safety walk down.
4. Prior to the introduction of highly hazardous chemicals to a new process, training of each employee involved in operating the process is completed.
5. Records of PSSR's are maintained in the Engineering File Office.

H. *Mechanical Integrity*

AbitibiBowater is committed to maintaining the process equipment of PSM covered processes. The Mechanical Integrity program is described separately, and is under the direction of the Maintenance Manager.

The Mechanical Integrity program applies to process equipment within the PSM covered processes, including pressure vessels, storage tanks, piping systems, relief and vent systems and devices, emergency shutdown systems, controls and pumps.

The Mechanical Integrity program has the following features, which are described in detail in the AbitibiBowater Mechanical Integrity Program for the Calhoun Operations:

- Written Procedures (Operating Procedures; Inspection, Testing and Preventive Maintenance; Standard Maintenance Procedures)
- Training for Process Maintenance Activities
- Inspection, Test and Preventive Maintenance
- Equipment Deficiency Plan
- Quality Assurance

Safe work practices, such as Hot Work, are described in the applicable AbitibiBowater Safety Policy. Copies of all Safety Policies are available for employees on the Safety website on the Calhoun intranet.

I. Hot Work Permit

AbitibiBowater issues a permit for all hot work operations outside authorized fabrication shops. A copy of the Hot Work Policy is available for all employees on the Safety website that is part of the Calhoun intranet.

The permit documents that the fire prevention and protection requirements of 29 CFR 1910.252 (a) have been implemented prior to beginning the hot work operations. It indicates the date(s) authorized for hot work; and identifies the object on which hot work is to be performed. The permit is kept in the field until completion of the hot work operations. After completion of hot work, the Hot Work permit is sent to Safety, where it is evaluated and retained for at least one year.

J. Management of Change

AbitibiBowater has established and implemented written procedures to manage changes. The procedures are described in AbitibiBowater's "Management of Change Procedures", in the following pages.

1. The procedures assure that the following considerations are addressed prior to any change: the technical basis for the proposed change; impact of change on safety and health; modifications to operating procedures; necessary time period for the change; and authorization requirements for the proposed change.
2. Employees involved in operating and maintaining a process, along with contract employees whose job tasks will be affected by a change in the process are informed of, and trained in, the change prior to start-up of the process or affected part of the process.
3. If a change results in a change in the process safety information required, such information and any changes to procedures are updated accordingly.

Management of Change Procedures

A. PROCESS CHANGES

1. NON-EMERGENCY

- a. Using a "Management of Change - Request" form, the initiator records the information indicated, including a description of the proposed change. Reverse side of form can be used for additional Description or Comments.
- b. Change information is reviewed by a team consisting of a minimum of three - 1 from the affected Dept., 1 from Engineering, and 1 from Safety & Health. They review the change and mark the appropriate box for APPROVED or NOT APPROVED. The reverse side of the form can be used for COMMENTS on Approval or Rejection rationale.
- c. The review team also decides and marks which items on the list are 'Requirements' are needed. The review team designates a responsible Person & Dept. for each of the requirements marked.
- d. Designated Persons notify the MoC Committee Leader (Initiator or Dept. Supv.) when their assignment has been completed and Date & Initial the MoC form.
- e. The MoC Committee Leader then forwards the form to the PSM Coordinator, who will verify the work has been completed, then sign and date the MoC form. The form is then taken to the records storage room and filed.

2. EMERGENCY

- a. The Initiator fills out the same information as described in 1(a) above
- b. The information is reviewed by a team (minimum of three - consisting of 2 from affected Dept. operations and 1 from Maintenance). They review the change to ensure Safety & Health risks are not increased before marking the APPROVED or NOT APPROVED box. The reverse side of the form can be used for COMMENTS on Approval or Rejection reasons.
- c. Emergency Job MoC form is sent to the Safety Department as soon as possible. The PSM Coordinator is responsible for ensuring that the risk of change is evaluated and documented through the normal change process.

B. OPERATING PROCEDURES CHANGES

1. Developing and maintaining Operating Procedures is the responsibility of the operating departments. For PSM covered process areas, procedures will be written according to requirements found in 29 CFR 1910.119(f).
2. When changes are necessary, resulting from changes in process chemicals, technology, and equipment, and changes to facilities, these changes are documented by retaining a dated copy of the old procedures marked-up to show the changes. Revision dates will be noted on the revisions. One copy of old procedures will be retained in the Operating Department files where the change occurs for at least five years, to provide a history of changes.

C. PROCESS CONTROL COMPUTER DISPLAY CHANGES

1. Developing and maintaining process control computer screens is the responsibility of the Operating Departments, Process Control, and Automation Systems departments.

2. When changes are necessary, these changes are documented by retaining a dated copy of the old display with the date of change, and a copy of the revised display. Old copies will be retained in the Operating Department files where the change occurs.

D. FOLLOW-UP OF ACTION ITEMS

1. Action items developed at the Management of Change (MoC) meeting are recorded on the "Management of Change Request" form, with a person designated responsible and target date.
2. When the target date is reached, the MoC Committee Leader sends a reminder to the responsible person.
3. When each item is complete, the responsible person will notify the MoC Committee Leader, and the completion date will be entered on the PSM Action Item Master List.
4. Incomplete MoC action items will be periodically reviewed by the MoC Committee Leader. The PSM Coordinator will get involved, as required, to help see that the MOC action items are completed.



Health and Safety Policy and Procedures
PROCESS SAFETY MANAGEMENT



Reviewed 12/09/10

MANAGEMENT OF CHANGE - REQUEST

DATE		
INITIATOR		
DEPARTMENT		
BASIS FOR CHANGE	<i>(MOC file code)</i>	
PERMANENT or TEMPORARY		
DESCRIPTION		
SCHEDULE INFO		

RESPONSE (REVIEW AND APPROVAL BY)	1.	CHECK ONE	
	2.	Approve	
	3.	Not Approve	

MANAGEMENT OF CHANGE REQUIREMENTS:

Item	Required Yes or No	Responsibility	Date/Initial
Hazard Evaluation			
Safety Design Review			
New/Revised Operating Procedures			
Operator Training			
Maintenance Training			
Process Flow Diagram Update			
P&ID Update			
Loop/One Line Drawing Update			
Spare Parts Review			
Environmental Requirements Revision			
Pre-Startup Safety Review			
Other			

ALL REQUIRED REVIEWS COMPLETED Signed _____ Date _____

PRE-STARTUP SAFETY REVIEW MEETING

TITLE:

Date:

PARTICIPANTS:

Requirements of PSSR:

- Construction and equipment is in accordance with design—walk down system.
- Safety information is in place and adequate.
- Operating Procedures and Operator training is in place and adequate.
- Maintenance Procedures and training are in place and adequate.
- Meeting representation: operations supervisor, operator, engineer, safety, maintenance and contractor if applicable.

MEETING NOTES:

PERSON	DISCUSSION	ACTION ITEM #

PSSR approval: _____ **Date:** _____

K. Incident investigation

AbitibiBowater - Calhoun Operations will promptly investigate any incident which resulted in (or could reasonably have resulted in) a catastrophic release of highly hazardous chemical in the workplace.

"Promptly" is defined as beginning as soon as practicable, but not later than 48 hours after the incident. A "catastrophic release" means a major uncontrolled emission, fire, or explosion, involving one or more highly hazardous chemicals, that presents serious danger to employees in the workplace.

The procedure is described in AbitibiBowater's "Accident/Incident Investigation Policy". The Supervisor or Team Leader of the incident site will initiate the investigation and follow up on corrective action items. Priorities and target completion dates are set by the investigation team.

Accident/Incident investigations are documented and tracked by using the Incident Reporting option found on the main Calhoun intranet website. The incident investigation form, printing options, actions items, and follow up tracking are all part of the on-line system.

L. Emergency Planning and Response

AbitibiBowater has established and implemented an "Emergency Response Plan" for the entire plant (separate document). In addition, operating departments have developed departmental Emergency Response Plans specifically for their departments. The plans include procedures for handling both large (evacuation) and small releases of hazardous chemicals. A copy of the Emergency Response Plan can be found on the Safety website of the Calhoun intranet.

M. Compliance Audits

AbitibiBowater evaluates compliance with the provisions of Tennessee Occupational Safety and Health regulation 29 CFR 1910.119 at least every three years to verify that the procedures and practices developed under the standard are adequate and are being followed. A report of the findings of the audit is developed. Documentation of this evaluation is the "Certificate of Evaluating Compliance".

Each of the findings of the compliance audit is addressed promptly, and documented. Deficiencies shall be corrected in a timely manner on a priority basis, and the corrections documented. The highest priority findings—Priority 1—are to be completed within 30 days. Priority 2 findings are to be completed within 90 days. Priority 3 findings are to be completed in 6-12 months. The procedure for assigning priority is described in the PROCESS HAZARD ANALYSIS section.

The status of findings will be addressed periodically with senior management.

Compliance Audits dates and certifications are in Engineering File Room.

N. Trade Secrets

AbitibiBowater has no trade secrets from those persons responsible for compiling the process safety information, those assisting in the development of the PHA, those responsible for developing the operating procedures, and those involved in incident investigations, emergency planning and response and compliance audits.

VI. PSM RESPONSIBILITIES

A. Mill Management

Mill management is responsible for providing resources necessary to implement the PSM activities, including developing such items as operating procedures, training, and mechanical integrity.

B. PSM Coordinator

The PSM Coordinator manages the PSM program – with assistance from the Manager of Health and Safety – with focus on engineering and maintenance, especially Mechanical Integrity. The Coordinator also focuses on ensuring that PHA's are revalidated every 5 years, evaluates AbitibiBowater's PSM compliance using an auditor from outside the mill every 3 years, and ensures that annual PSM tasks are completed.

C. Operating Department Superintendents Area Managers

Operating Department Superintendents in which hazardous chemicals are found are responsible for scheduling employees for PHA activities, operator training and refresher training, annual certification of operating procedures, maintaining records, and completing action items from PHA's, Managed Changes, and Incident Investigations. PSM operating departments include the Kraft Mill, Utilities, and TMP. Area managers are the Utilities Manager and the Pulp Operations Manager.

D. Manager of Health and Safety

The Manager of Health and Safety is responsible for assisting with the PSM program. These tasks include employee training in safe work practices, emergency response, and hazardous communications. He also manages the emergency response teams and AbitibiBowater's involvement in community emergency response.

E. Employees

AbitibiBowater and contractor employees are responsible for following operating procedures and participating in the various PSM activities.

F. Supervisors

Shift and Day Supervisors in PSM departments are responsible for assisting in ensuring that process safety information is available, training is delivered, operating procedures followed, and records kept.

G. Contractors, Visitors, etc.

All non-employees on the mill site are responsible for following the AbitibiBowater PSM policy. Contractors must ensure that their employees understand the hazards of the PSM processes and can effectively respond to mill Emergency Response procedures.



Health and Safety Policy and Procedures
PROCESS SAFETY MANAGEMENT

Approval Signatures:

Joe Vaughn
V. P. & Res. Mgr.

Scott Palmer
Pulp and Utilities Mgr.

Larry Vest
Health & Safety Mgr.

Kevin Owen
Utilities Mgr.

Chuck Krecklow
Mfg. Excellence Mgr.
PSM Coordinator

Winton Westberry
Maintenance Mgr.

Paul Ingraham
Pulp Production Mgr.