

<b>EQUIPMENT and LINE BREAKS</b>	Procedure Number <b>SAF-1.04</b>
	Issue Date <b>March 21, 2003</b>
<b>SAFETY</b>	Revision Date <b>December 12, 2017</b>
	<b>Page 1 of 9</b>

<p><b>ISSUED BY:</b></p> <p><i>Greg Barnett</i>      <u>1-12-18</u>          Safety Manager      DATE          Coosa Pines Mill</p>	<p><b>APPROVED BY:</b></p> <p><i>PL Hegg</i>      <u>1-12-18</u>          General Manager      DATE          Coosa Pines Mill</p>
<p>INTERPRETATION AND PERIODIC REVIEW OF THIS PROCEDURE IS THE RESPONSIBILITY OF:      <b>SAFETY MANAGER</b></p>	
<p><b>DISTRIBUTION</b></p> <p>ALL MANAGERS ALL TEAM LEADERS</p>	

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	Issue Date <b>March 21, 2003</b>
<b>SAFETY</b>	Revision Date <b>December 12, 2017</b>
	<b>Page 2 of 9</b>

**1.0 PURPOSE**

The purpose of this document is to provide guidelines for safely breaking into or working on any system, pipeline, or equipment.

**2.0 SCOPE**

This policy covers the breaking or opening of any pipeline, connected fittings, valve, pump, vessel, process sewer, or other equipment which may present a hazard to employees.

- 2.1 This policy applies to all Coosa Pines employees and contractors involved in opening any closed systems carrying hazardous materials, hot materials (over 140° F), or pressurized systems (over 75 psi) including, but not limited to, sulfuric acid, green, white, and black liquor, DNCG, CNCG, SOG, chlorine dioxide, sodium hydrosulfite, propane, natural gas, methanol, foul condensates, hydrogen peroxide, hydrogen sulfide, fuel oil, turpentine, kerosene, and specialty chemicals (e.g., slimicide/biocide).
- 2.2 The requirements of this policy are mandatory minimum conditions that must be met prior to equipment or line opening or breaking. Employees and contractors are not relieved of the responsibility for initiating higher standards when necessary for the safety of personnel and property.
- 2.3 This policy does not apply to hot taps, routine inspections, observations, or equipment adjustments done in accordance with standard operating practices, where safe work practices are part of the procedure.
- 2.4 This policy does not cover the opening of pipelines or systems containing only process, potable or filtered water at a temperature less than 140° F, or compressed air pipelines or systems at a pressure less than 75 psi or instrument air piping that is less than 1 inch in diameter.
- 2.5 This policy does not include opening man-ways connected to tanks where the level in the tank has been visually confirmed to be below the bottom of the man-way to be opened.
- 2.6 This policy is intended to augment lockout and confined space procedures, but not replace them.

**3.0 DEFINITIONS**

- 3.1 Back-up – The individual(s) outside the barricaded area to assist the entrant with egress if necessary.
- 3.2 Entrant – The individual(s) performing the equipment or line break inside the barricaded area.

<b>EQUIPMENT and LINE BREAKS</b>	Procedure Number <b>SAF-1.04</b>
	Issue Date <b>March 21, 2003</b>
<b>SAFETY</b>	Revision Date <b>December 12, 2017</b>
	<b>Page 3 of 9</b>

- 3.3 Hazardous Materials – Caustic solutions, acid solutions, flammable gases and liquids, hot (greater than 140° F.) materials, materials greater than 75 psi, steam or any other process materials that may pose potential health hazards.
- 3.4 Hot Materials – All pipe lines, equipment and dryer cans carrying hot materials (over 140° F).  
 Exception: If the line/equipment/dryer can is no longer hot to the touch at the entire section the material could be released from, then the material in the line/equipment would be the deciding factor.
- 3.5 Line-Breaking/Opening – Any activity during which normally closed systems (e.g., pipelines, pumping systems, vessels, process sewers, sight/gauge glasses, etc.) which may contain materials that present a hazard to employees, are opened to the atmosphere.
- 3.6 Line Breaking Permit – The permit that must be completed before breaking any pipeline or equipment covered by this document.
- 3.7 Lockout – Physically de-energizing, isolating and locking out all potential hazardous energy sources (see “General Hazardous Energy Lockout Policy”).
- 3.8 Personal Protective Equipment (PPE) – Any equipment or clothing which gives the wearer added protection from potential hazards.
- 3.9 Pressurized Systems – Any system operating at over 75 psi (Hydraulic or Pneumatic).  
 Exception: If the system is proven depressurized, then the material in the line/equipment would be the deciding factor.

#### 4.0 GENERAL

- 4.1 The act of opening pipelines or equipment can present a severe injury potential due to the nature, pressure, and/or temperature of materials in the pipelines or equipment. Every effort must be made to eliminate all hazards before authorization for breaking into equipment is given. This may include activities such as draining and flushing hazardous materials, isolating the work and equipment by locking out, relieving pressures, cooling hot materials, providing special shielding, and thoroughly checking each aspect of the job.
- 4.2 Contractors will follow the guidelines for line breaking specified here, and will, at a minimum, meet the requirements of this procedure.
- 4.3 Line Break Permits will be sent to the Safety Department to be audited and will be kept on file for 12 months.

<b>EQUIPMENT and LINE BREAKS</b>	Procedure Number <b>SAF-1.04</b>
	Issue Date <b>March 21, 2003</b>
<b>SAFETY</b>	Revision Date <b>December 12, 2017</b>
	<b>Page 4 of 9</b>

**5.0 TRAINING AND DOCUMENTATION**

- 5.1 Each individual authorized to perform line breaking shall receive training and demonstrate knowledge of this procedure prior to performing line-breaking tasks. Documentation will be kept as part of the employee's training record.
- 5.2 Retraining for all authorized individuals will occur when there is a change in procedure, process, equipment, an inadequacy in the program is observed, or an employee demonstrates a lack of understanding of this policy.

**6.0 PROCEDURE**

- 6.1 Qualified employees familiar with the operation of the system are responsible for isolating, draining, flushing, venting, and preparing the system for safe opening, in accordance with procedures.
- 6.2 Qualified employees will jointly complete a Line Break Permit (see **ATTACHMENT 1**). The permit must be posted or available near the site of the equipment or line break.
- 6.3 The work area must be adequately barricaded (curtains or splash guards) to protect others from sprays and splashes or instantaneous toxic gas releases. Consideration should be given to volume/pressure of the suspected material contained in the piping, and height at which work is being performed.
- 6.4 Regardless of preparations, it must be assumed during the initial breaking of lines, systems or equipment that a hazardous condition may exist and an Equipment & Line Break Permit must be completed.
- 6.5 The minimum PPE requirements must be reviewed and implemented (see **ATTACHMENT 2**). The Safety Data Sheet, relevant HELP procedures and/or Maintenance Safe Work Practices are additional resources.
- 6.6 Employees working with the individual(s) assigned to perform a line break, and exposed to the same hazard as the member(s) making the line break, must be protected by the same level of personal protective equipment and have a good understanding of the hazards potential.
- 6.7 When the minimum PPE table (**ATTACHMENT 2**) requires the use of SCBA for equipment and line breaks, the following minimum conditions must be met:
  - 6.7.1 The ERT must be notified;
  - 6.7.2 Individuals performing the equipment or line break (entrant) must be kept to the minimum number necessary to safely perform the work;
  - 6.7.3 There must be one individual (back-up) outside the barricaded area for every entrant to assist the entrant with egress if necessary;

<b>EQUIPMENT and LINE BREAKS</b>	Procedure Number <b>SAF-1.04</b>
	Issue Date <b>March 21, 2003</b>
<b>SAFETY</b>	Revision Date <b>December 12, 2017</b>
	<b>Page 5 of 9</b>

6.7.4 The back-up(s) must be in at least the same level of PPE as the entrant(s);

6.7.5 The back-up(s) must have the means and the ability to call for emergency assistance if needed.

**NOTE:** The employee(s) serving as back-ups need not be ERT members.

- 6.8 In situations where the hazard is confirmed as **not** being present after the “break” is performed, the PPE being worn and requirements for back-ups may be modified to what is required for the confirmed actual conditions.
- 6.9 After the initial line break is performed and the hazards **cannot** be eliminated (such as when unplugging a pipe) all initial line break requirements must be maintained throughout the task.
- 6.10 All individuals involved must understand the proper method of collecting, containing, or adequately draining possible spilled materials. They must make preparations for the unexpected.
- 6.11 When breaking a flange, loosen the bolts & nuts in the lower and opposite side from the individual performing the work, keeping the bolts & nuts on the side nearest the individual under control. This allows the line to separate in a manner that will cause any spillage or gas release to be away from the individual. Do not remove any bolts until the flange has been spread sufficiently to see through the flange. The individual should always be positioned on the upwind side of the flange being broken.
- 6.12 Unions must be broken by loosening the nut two (2) turns while positioned in front of the union. Establish drainage by pushing the pipe away from the individual to cause misalignment. Completely removing the nut on the union is acceptable when it is determined that no material or pressure is in the system.
- 6.13 Where a valve bonnet must be removed, the pipeline must be drained and the valve placed in the open position before the bonnet bolts are loosened.
- 6.14 These procedures must be followed for lines or man-ways that are blocked or are suspected to be blocked. Where blockage is suspected, no liquid or gas should be used to clear the blockage above the rated pressure of the pipeline or equipment, assumed to be 150 psi unless a higher pressure rating is confirmed.
- 6.15 After breaking lines normally containing hazardous materials such as chlorine dioxide (CLO<sub>2</sub>), hydrogen sulfide (H<sub>2</sub>S) or flammable gases or liquids, the open line must be tested for the presence of O<sub>2</sub>, CIO<sub>2</sub>, H<sub>2</sub>S and LEL before work begins.

<b>EQUIPMENT and LINE BREAKS</b>	<b>Procedure Number</b> <b>SAF-1.04</b>
	<b>Issue Date</b> <b>March 21, 2003</b>
<b>SAFETY</b>	<b>Revision Date</b> <b>December 12, 2017</b>
	<b>Page 6 of 9</b>

## **7.0 ATTACHMENTS**

- 7.1 Attachment 1 – Line Breaking Permit
- 7.2 Attachment 2 – Minimum PPE Requirements
- 7.3 Attachment 3 – Record of Revisions

<b>EQUIPMENT and LINE BREAKS</b>	Procedure Number <b>SAF-1.04</b>
	Issue Date <b>March 21, 2003</b>
<b>SAFETY</b>	Revision Date <b>December 12, 2017</b>
Page 7 of 9	

### Attachment 1

**EQUIPMENT & LINE BREAK PERMIT**  
**COOSA PINES**

ALL PIPELINES OR SYSTEMS COVERED UNDER OUR POLICY, EVEN THOUGH DRAINED AND VENTED, MUST BE ASSUMED TO CONTAIN HAZARDOUS MATERIAL.

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DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ (Permit is good for the duration of the job.)  
*(All persons performing the work and/or exposed to the hazard are responsible for obtaining and using proper PPE.)*

Location of Line: \_\_\_\_\_

Job Description: \_\_\_\_\_

Material Possibly In Line: \_\_\_\_\_  
*(If applicable, specify if greater than or less than 140 Degrees or 75 PSI)*

Line Size: \_\_\_\_\_ Type of Pipe: \_\_\_\_\_

Will pipe be supported/secured once line break occurs? (Circle One) YES NO N/A

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**SAFETY REQUIREMENTS**

For chemicals listed on the spreadsheet (back of permit), follow those PPE requirements \_\_\_\_\_

Chemical Goggles \_\_\_\_\_ Face Shield \_\_\_\_\_ Chemical Suit \_\_\_\_\_ Carbonex Suit \_\_\_\_\_ Rubber Boots \_\_\_\_\_

H<sub>2</sub>S Monitor \_\_\_\_\_ Respirator \_\_\_\_\_ SCBA \_\_\_\_\_ Multi-Gas Monitor \_\_\_\_\_

Cut-Resistant Leather Gloves \_\_\_\_\_ Cut-Resistant Chemical Gloves \_\_\_\_\_

Other (Specify): \_\_\_\_\_

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**TEAM MEMBER PREPARING LINE FOR WORK MUST CHECK BOXES UNDER YES, NO OR N/A.**

YES	NO	N/A	Work Performed
			Valves Closed and Locked Out
			Lines Drained
			Vents Opened to Prevent Possibility of Air Lock
			Line Purged or Flushed
			Heat Tracing Turned Off
			Necessary Equipment Locked Out
			Area Flagged for Line Break

I certify that this equipment or line has been prepared in accordance with the Equipment & Line Break Procedure and is ready to be broken.

PRINT LEGIBLY: \_\_\_\_\_  
*(Name of Team Member Preparing for the Line Break)*

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**FOR ClO<sub>2</sub>, H<sub>2</sub>S, OR FLAMMABLE GASES OR LIQUIDS**

Oxygen \_\_\_\_\_ % LEL \_\_\_\_\_ % ClO<sub>2</sub> \_\_\_\_\_ PPM H<sub>2</sub>S \_\_\_\_\_ PPM

Tester \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

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**START-UP CHECKS**  N/A

PRINT LEGIBLY: \_\_\_\_\_  
*(Name of Team Member or Contractor Performing Line Break)* *(Company)*

YES	NO	N/A	Work Performed
			Gaskets In/Bolts Tightened
			Lines Connected
			Locks Removed
			Work Area Cleaned Up

ITEM # 104455  
Return completed form to the Operations Coordinator. Rev 9, 12/12/2017

<b>EQUIPMENT and LINE BREAKS</b>	Procedure Number <b>SAF-1.04</b>
	Issue Date <b>March 21, 2003</b>
<b>SAFETY</b>	Revision Date <b>December 12, 2017</b>
Page 8 of 9	

**Attachment 2**

HAZARD	MINIMUM PPE THAT IS REQUIRED WHEN OPENING OR CLEARING BLOCKAGES IN ANY CLOSED SYSTEMS CONTAINING THE HAZARDOUS MATERIALS LISTED BELOW.									
	CHEMICAL GOGGLES	FACE SHIELD	CHEMICAL SUIT	CARBONEX SUIT	CUT-RESISTANT LEATHER GLOVES	CUT-RESISTANT CHEMICAL GLOVES	RUBBER BOOTS	RESPIRATOR or SCBA	ATMOSPHERIC MONITOR	OTHER
Sulfuric Acid/Acid Solutions			X <sup>1</sup>	X <sup>1</sup>		X	X	SCOTT AV-2000 WITH SCOTT 642-AG or a 742-AG with HEPA FILTER (P-100)		
Green/White/Black Liquor	X	X	X <sup>1</sup>	X <sup>1</sup>		X	X			
Caustic Solutions	X	X	X <sup>1</sup>	X <sup>1</sup>		X	X			
Chlorine Dioxide			X <sup>1</sup>	X <sup>1</sup>		X	X	SCBA	Multi Gas Monitor	
Sodium Chlorate	X	X	X			X	X			
Hydrogen Peroxide	X	X	X <sup>1</sup>	X <sup>1</sup>		X	X			
Methanol	X	X	X			X	X			
Stripped Methanol			X			X	X	SCOTT AV-2000 WITH SCOTT 642-OV or a 742-OV	Multi Gas Monitor	
DNCG / CNCG / TRS			X			X	X	SCOTT AV-2000 WITH SCOTT 642-OV or a 742-OV	Multi Gas Monitor	
Turpentine			X			X	X	SCOTT AV-2000 WITH SCOTT 642-OV or a 742-OV	Multi Gas Monitor	
Steam/Condensate	X	X	X <sup>2</sup>	X <sup>1</sup>	X		X			
Materials Over 140 Degrees	X	X	X <sup>2</sup>	X <sup>1</sup>	X		X			
Pressures Over 75 PSI	X	X	X <sup>1</sup>	X <sup>1</sup>	X					

<sup>1</sup> Either chemical suit or carbonex suit can be worn.

<sup>2</sup> Heat rated.

- All pipelines or systems covered under our policy, even though drained and vented, must be assumed to contain hazardous material.
- When dealing with any corrosive, toxic, flammable, high temperatures and pressure, or harmful material, team members or contractor employees will wear appropriate body protection until equipment is open and actual conditions are determined.
- If toxic gas may be released, such as on the NCG system, chlorine dioxide system, process sewers, or other toxic gas line breaks, use an atmospheric monitor to verify H<sub>2</sub>S, CO, CL<sub>2</sub>, LELs, and Oxygen Concentrations are within safe parameters once the line is broken.
- The work area must be adequately barricaded (minimum 12' where possible) to protect others from sprays and splashes or instantaneous toxic gas releases.
- For any hazardous chemicals not covered, follow the PPE handling instructions in the Safety Data Sheet (SDS).
- You may substitute the Scott AV-2000 with HEPA Filter (P-100) for Chemical Goggles & Face Shield, if desired.



<b>EQUIPMENT and LINE BREAKS</b>	Procedure Number <b>SAF-1.04</b>
	Issue Date <b>March 21, 2003</b>
<b>SAFETY</b>	Revision Date <b>December 12, 2017</b>
	<b>Page 9 of 9</b>

**Attachment 3  
RECORD OF REVISIONS**

Section	Revision Number	Effective Date	Description Of Changes
ALL	1	04-21-08	Name change due to merger. Permit altered due to name change. Addition of Record of Revisions.
1, 2.1, 4.1, 5.2	2	04-03-09	Clarification: Including "process sewers" under Line Break activities.
2,3	3	06-19-09	Clarification of existing statements
ALL	4	05-11-11	General clarification of policy and changes to 8.1 minimum requirements to create spreadsheet.
8.1	5	08-08-11	Changes to 8.1 Minimum Requirements
5.2, 8.1, 8.2	6	06-11-12	Restructured Permit to single page, modified and added PPE Spreadsheet to back of Permit. Changed Permit to 8.1, changed PPE Spreadsheet to 8.2. Changed Policy references to match attachments. Modified 5.2 to remove option of wearing respirators with chemical cartridges during specified line breaking activities.
3.2	7	10-12-12	Removed "cleaning of tanks and equipment" from does not apply listing.
ALL	8	03-19-13	Name change to Resolute
ALL	9	02-10-14	Re-organized document, changed procedure number. Clarified requirements for equipment and line breaking requiring the use of SCBA.
Attachments 1 and 2	10	02/19/16	Inserted revised Equipment & Line Break Permit. Permit was rearranged to make areas to be filled in by users more visible. Updated Safety Manager.
ALL	11	06/24/16	Changed title page for current management signatures.
Permit	12	12/12/17	Permit update revisions for Carbonex Suits, gloves, and additions of Stripped Methanol and Sodium Chlorate.