

**I. PURPOSE**

To prevent injury when breaking or working on any line, connected fittings, valve, pump or vessel, including clearing of blockages which may contain hazardous materials.

**II. SCOPE**

This policy applies to anyone when breaking or working on any line, connected fittings, valve, pump or vessel, including clearing of blockages which may contain hazardous materials. The requirements of this policy are intended as mandatory minimum conditions that must be met prior to line breaking. Employees and contractors are not relieved of the responsibility for initiating higher standards when necessary for the safety of personnel and property.

**III. DEFINITIONS**

- A. **Line breaking/opening** - Any activity during which normally closed systems such as pipelines, pumping systems, sight/gauge glasses, etc. which may contain process materials, are opened to atmospheric pressure by unbolting/separating flanges, removing valves, cutting pipe, opening pump covers, removing instruments or gauges, or performing hot taps.
- B. **Blockage Clearing** - Any activity associated with removing actual or suspected blockages or obstructions from lines, fittings, valves, pumps or vessels which may contain any process materials. This is a special group of line breaking activities which may involve the additional hazards of opening a closed system without being able to drain process materials or depressurize the system.
- C. **Hot Tap** - Penetrating a process line or vessel while in service.
- D. **Hazardous Materials** - Caustic solutions, acid solutions, flammable liquids, hot (>140° F.) materials, or any other process materials that may pose potential health hazards require a permit. Examples of such materials include but **are not limited to**: sulfuric acid, green, white and black liquor, LVHC, HVLC, SOG, chlorine, chlorine dioxide, sodium hydrosulfite, sulfur dioxide, ammonia, propane, natural gas, methanol, hydrogen peroxide, hydrogen sulfide, fuel oil, turpentine, kerosene, and specialty chemicals (i.e. slimicide/biocide).
- E. **Process Materials** - Process materials include, but are not limited to, corrosive liquids, slurries and gases, liquids and gases including steam, water and condensate, toxic liquids and gases, combustible, flammable or explosive liquids and gases, and hot slurries including pulp and paper stock.
- F. **High Work** - Work being performed 4 feet or more above the ground or floor level, where there is no work platform with handrails.
- G. **Personal Protective Equipment (PPE)** - Any equipment or clothing which gives the wearer added protection from potential hazards. (See the PPE Policy)
- H. **PSM** - Process Safety Management. PSM regulates the systems that contain chlorine, chlorine dioxide, methanol, turpentine and NCG's. These systems may require additional preparation.
- I. **Line Breaking Permit** - The permit that operations/maintenance must fill out before work begins on any line that may contain any of the process materials described in paragraph V., C. 6. This permit will be displayed in plain view, on or close to the actual line being broken. Blank permits can be obtained from Mill Stores.

- J. **Lockout** - Physically de-energizing and locking out a potential safety hazard in accordance with the Lockout Policy.
- K. **Hot Work** - Any burning, welding, or cutting as defined in the Hot Work Safety Policy.

IV. **POLICY**

All line breaking activities will be conducted in strict compliance with the procedures and responsibility requirements described in this policy.

V. **PROCEDURES**

- A. Operations personnel will confirm the correct line requiring attention. The actual contents (service) of the line prior to "breaking" will be verified.
- B. The line will be isolated, prepared, pressure relieved and drained, and locked out for maintenance and/or contractor personnel by operations personnel. The line should be purged as applicable. In spite of the various precautions taken, a closed system containing process materials may remain under pressure due to a blockage even after the system has been opened. Therefore, until it can be positively assured the system has been depressurized, it should be regarded as being under pressure and appropriate personal protective equipment shall be worn.
- C. All lines carrying hazardous materials are to be closed and locked out by the following method, whenever possible:
  - 1. Close and lock out the valve upstream and downstream of the work. When possible, lines are to be bled/drain between the locked out valve and pump, the bleed/drain valve left open. The supply pump should be locked out when applicable.
  - 2. If double valves are present, both should be closed and locked out. When possible, lines are to be bled between the double valves and the bleed valve left open and locked. When dealing with hazardous chemicals where double valves do not exist, it may be necessary to roll a spool piece out of line.
  - 3. Drain and pressure relieve lines as completely as possible, assuring that the drained material itself does not become a safety or environmental hazard. Prior to line breaking, precautions must be taken to assure that no adverse impact upon safety and the environment will occur from material that may discharge from the line when it is broken.
  - 4. Neutralize and clean up any drained or flushed fluid before proceeding. Line breaking can be dangerous and requires as clean a working environment as possible.
  - 5. Lines in corrosive, flammable, or hazardous material service are to be flushed or purged, prior to breaking.
  - 6. Obtain and initiate a Line Breaking Permit if required.(as outlined below) Evaluate the conditions and locations of pipe supports and hangers. If line breaking would result in the need for some additional support, the permit should so note.
    - a. A Line Breaking Permit is to be filled out and signed by Operations before disconnecting any lines that may present a potential hazard to personnel. Lines that contain caustic solutions, acid solutions, flammable liquids, hot (>140° F.) materials, or any other process materials that may pose potential health hazards require a permit. Examples of such materials include but **are not limited to**: sulfuric acid, green, white and black liquor, LVHC, HVLC, SOG, chlorine, chlorine dioxide, sulfur dioxide, ammonia, steam, hot stock, propane, natural gas, methanol, hydrogen peroxide, hydrogen sulfide, fuel oil, turpentine, kerosene, and specialty chemicals.

- b. Responsibility: This permit will be completed by the operations person who prepared the line for maintenance and the person doing the maintenance work. *Permits must be filled out to clearly define contents & hazards ( temperature, pressure, pH ).*
  - c. The completed permit will be displayed at the job site.
- D. Line Breaking - Maintenance and/or contractor personnel will check to ensure that the line breaking permit has been completed and signed by operations. Isolation valves must be checked and personal locks must be placed on the lockbox or valve with chain, in strict compliance with the lockout policy, before beginning work on the line.
- E. All personnel will be required to wear proper personal protective equipment as is customary in all circumstances when there is potential exposure to hazardous materials. (see PPE chart included with this policy)
- F. Job Site Requirements and Line Breaking Guidelines: Operations is responsible for safeguarding the job site until maintenance begins work, at which time the responsibility transfers to those individuals performing the work. These steps include:
- 1. Reasonable steps must be taken to ensure that other persons throughout the work area will not be exposed to potential hazards and injury during line depressurization, draining, purging and/or line breaking. This is accomplished by:
    - a. Safeguarding the job site with warning signs, barricades, barricade tape or a standby person to keep others out of the area,
    - b. Allowing only people involved in the job inside the secured area,
    - c. Requiring everyone inside the secured area to use the required personal protective equipment,
    - d. Containing drains or spills, and
    - e. Safeguarding any exposure areas on lower floors.
  - 2. Safety showers and eye wash stations near the job site must be checked for proper operation prior to starting work. If no shower or eyewash is available, a hose connected to a source of potable water should be provided.
  - 3. Wash down hoses shall be set up where appropriate to wash away or dilute any spills that might occur.
  - 4. Extreme care must be taken to ensure that acids and caustic are not mixed.
  - 5. While each specific job may necessitate different ways to open process systems, the following standard steps are suggested:
    - a. Shield flanges whenever possible and the employee should stand to the side to avoid any sprays or spillage.
    - b. When loosening the bolts of flanges or covers, loosen those bolts which are farthest from the worker first.
    - c. Breaking lines containing flammable material: When breaking lines containing flammable material, fire protection equipment must be available. If possible, the line will be tested to determine the lower explosive limit of the flammable material. If the line cannot be tested and/or purged to 0% LEL, the operations superintendent/area supervisor, maintenance supervisor, and a Safety department representative must be notified prior to commencement of the job.

- d. In situations where burning is the only way to remove bolts a Hot Work Permit is required, for flammable or combustible materials the line must be purged with steam or nitrogen and a slight purge shall be continued through the line during burning of the flange bolts. A Hot Work Permit is mandatory.
  - e. Whenever possible, and in any case where flange or cover bolts must be cut or burned off, at least 50% of the old bolts should be removed, one at a time, and replaced with new bolts which can be gradually backed off. This will help prevent sudden opening of the joints particularly when the joints may be under stress.
  - f. When breaking lines which may contain hazardous materials, a safety shower must be within fifty feet of the breaking operation, or appropriate alternatives set up (i.e. portable eye wash station or potable water source).
  - g. Breaking lines under pressure: There may be situations where a line under pressure must be broken. When this occurs, the operations superintendent/area supervisor, the maintenance supervisor, and the employees performing the work will assess the job and as a group agree on the safest possible method.
  - h. **Hydraulic Lines:**
    - Three types of hazards exists involving hydraulic lines: Burns from the hot, high pressure spray of fluid; cuts or abrasions from failing hydraulic lines; and injection of fluid into the skin.
    - Hydraulic lines and components shall be pressure relieved to a zero energy state, and valves or equipment locked out prior to disconnecting fittings. Refer to the Lockout Policy for lockout procedures of hydraulic equipment.
    - The appropriate PPE shall be worn during the depressurization and breaking of all hydraulic lines.
    - The Operating Department i.e., Maintenance, I&E/ Contractor Supervision shall initiate the line break permit for the process involved.
  - i. Breaking lines from a ladder: Before line breaking from a ladder, the supervisor of the employee doing the work, an operations representative, and the employee(s) performing the work will review the hazards of the job, taking into consideration such items as the hazards of the material, size of line, temperature of the contents, weight of the valve being changed, etc. If safety is in doubt, scaffolding or an elevated platform shall be used. If a hazardous material is involved in the line breaking, do not use a ladder. A scaffold, scissor lift, JLG lift or similar equipment must be used. If the line breaking from a ladder (for non-hazardous material only) is to be done, safe ladder procedures must be strictly followed. When working over 4 ft. off the ground, the individual performing the line breaking must be tied off with a full body harness and a fall arresting lanyard.
6. Special concerns when clearing a blockage:
    - a. Working on a line that is blocked or may not be completely drained requires extra caution to ensure that the obstruction is removed in a controlled fashion.
    - b. Tight spaces or hard-to-reach locations may reduce a worker's ability to escape a hazardous situation rapidly. Special equipment or special work platforms with clear escape paths may be needed to provide adequate protection.
  7. Hot Taps - This procedure does not cover the additional requirements for hot taps. Hot taps require individual review and planning by department management or Engineering/Maintenance Planning.
  8. Maintenance will notify operations when the job is complete.

9. Operations shall remove any warning signs or barricades after job is completed and the line has been safely returned to service.
  10. Operations will return the permit to the Safety department when the job is complete.
- G. Training and documentation:
1. Anyone involved in line breaking activities must be trained and show competency in the policy, procedures, and guidelines of the Line Breaking Procedure.
  2. Pre-requisite training:
    - a. Lock Out Procedure
    - b. Confined Space Entry Procedure
    - c. PPE Procedure
    - d. PSM training (for covered processes)
    - e. Hot Work Procedure
    - f. High Work
    - g. Respiratory Protection Procedure
    - h. Any new policies/procedures which are pertinent to line breaking but were not in effect at the revision date of this procedure.
    - i. MSDS Training

## VI. RESPONSIBILITIES

- A. Operations is responsible for:
1. Ensuring that operations employees involved in line breaking activities have been trained as specified in Section V. G. of this policy.
  2. Identifying and preparing the line for breaking.
  3. Job pre-planning to include consulting with the appropriate departments/personnel to ensure that any special safety requirements have been addressed. (i.e. >0 LEL, lines under pressure, etc.)
  4. Obtaining and initiating the Line Breaking Permit.  
Consulting the PPE Chart for the correct PPE to be worn while breaking the line and indicating the required PPE on the Line breaking Permit.
  5. Safeguarding the job site until maintenance/contractor begins work.
  6. Removing barricades and warning signs when line has been safely returned to service.
  7. Returning Line Breaking Permit to Safety.
  8. Auditing the permit to make sure all work has been done according to the Line Breaking policy

**B. Maintenance/Contractor Supervision**

1. Ensuring that maintenance employees involved in line breaking activities have been trained as specified in Section V. G. of this policy.
2. Ensure that maintenance employees have a safe work platform.
3. Ensure that all maintenance employees are wearing the proper personal protective equipment for the particular job. (see chart & addendum)

**C. Maintenance/Contractor Employees**

1. Assume the responsibilities of safeguarding the job site from operations.
2. Know, understand, and follow the requirements of this policy.
3. Obtain and wear the proper personal protective equipment necessary for the particular job. (see chart & addendum)
4. Clean up work site, sign Line Breaking Permit, and notify operations when the job is complete.

**D. Safety Department**

1. Audit the line breaking program and review this policy annually or more frequently if needed.
2. Assist departments in identifying hazards including consulting with the appropriate departments/personnel to ensure that any special safety requirements have been met. (i.e. >0 LEL, etc.)

**VI. PPE CHART**

The minimum PPE that is required when breaking lines containing the listed process materials can be found on the chart included with this policy.

	CUT 4 GLOVES	CHEMICAL GLOVES	SUPPLIED AIR	CHEMICAL SUIT W/HOOD	RUBBER BOOTS	CHEMICAL GOGGLES/FACE SHIELD	FACE SHIELD	LONG SLEEVE	PERS GAS MONITOR	HEAT REST GLOVE	RESPIRATOR
<b>* NOT ESCAPE RESPIRATOR (See RPP Policy)</b>											
Sulfuric Acid	X	X		X	X	X	X				
Green/White/Black Liquor	X	X		X	X	X	X				
NCG's	X	X	X	X	X				H <sub>2</sub> S		
Chlorine (GAS)	X	X	X	X	X				Cl <sub>2</sub>		
Chlorine Dioxide	X	X	X	X	X				ClO <sub>2</sub>		
Ammonia	X	X	X	X	X						
Hot Materials (>140 degree)	X	X		X	X	X	X				
Propane	X					X	X				
Natural Gas	X		X			X	X				
Methanol	X	X	X	X							
Hydrogen Peroxide	X	X		X	X	X	X				
Hydrogen Sulfide	X	X	X	X	X				H <sub>2</sub> S		
Turpentine	X	X		X	X	X	X				
Kerosene	X	X		X	X	X	X				
Bark Boiler Ash Re-injection	X									X	X
Sodium Chlorate	X	X		X	X	X	X				
Nitrogen	X		X							X	
Oxygen	X					X	X	X		X	
Caustic	X	X		X	X	X	X				
Slimicide/Biocide	X	X		X	X	X	X				



Calhoun Operations


**LINE BREAKING POLICY AND PROCEDURE**

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**Approval Signatures:**

Revised: 09/13/19

Effective 10/1/07

  
Safety Manager

  
General Manager