LINE BREAKING PROCEDURE

1 PURPOSE

To protect employees from injury caused by the unexpected release of **hazardous materials** while opening or disconnecting process piping or equipment that cannot be verified as cleared and/or depressurized.

*Verified*: to confirm by flow of flush liquid or air/nitrogen, open and clear bleeder within four feet of break point or some other method which proves that only residual material may be present. Other methods of verification may include:

1.1 instrumentation specific to the chemical hazard  
1.2 chemical (color change) indicators  
1.3 surface temperature of the external piping (indicating trapped liquid)

2 SCOPE

This procedure pertains to all personnel who participate in line breaking activity. This procedure includes flanged or welded piping as well as process equipment. **Consideration will be given to others working downwind, or above and below the linebreak at an appropriate distance.**

3 APPLICATION

This procedure applies anytime process equipment or piping containing or having previously contained hazardous material is to be opened and cannot be verified as being cleared of **hazardous material**.

For the purpose of this procedure the term **hazardous material** shall mean any substance that is corrosive, toxic, flammable, reactive, under pressure greater than 10 psi, above 120 °Fahrenheit or at or below 32 °Fahrenheit. This procedure also applies to plant utilities such as air, nitrogen, and water when defined as hazardous.

This procedure is to be used in conjunction with applicable Plant Policies and Procedures. Each situation must be evaluated individually to employ the appropriate safe guards for the particular job. Respiratory, eye / face and hand protection may be needed even if the line breaking procedure is not used due to residual material and vapor concentration.

In situations where the system cannot be **verified as cleared and/or depressurized** due to plugging, Line Breaking protective measures shall be utilized for multiple breaks until the plug is found and eliminated.

**Warning** – High temperature and extremely low temperature materials pose additional hazards not addressed by this procedure.
4 PROCEDURE

The EQUIPMENT OWNER shall:

4.1.1 Ensure piping or equipment has been shut down, isolated, blocked, and cleared, per department SOP's and Plant Safety Policies and Procedure.

NOTICE: Due to design of piping and/or equipment, hazardous material may be present due to low points and plugging. Precautions must be taken when opening or moving these sections.

4.1.2 Control all job related energy sources by placing them in a safe condition and locking with an Owner Lock as detailed in Safety Procedure 6 (Lockout Procedure). Where possible, drains shall be locked in the open position and rodded with a solid device to insure there is no accumulation of stored product.

4.1.3 List on the "Job Ready" tag:

4.1.3.1 The potential contents of the isolated section. For example: A pipeline in caustic service has been washed and cleared. The potential contents would include caustic.

4.1.3.2 The Personal Protective Equipment requirements to protect affected employee(s) from exposure to or contact by the potential contents of the isolated section. (See attached PPE Matrix for minimum requirements).

4.1.4 Sign and date the “Job Ready” tag.

4.2 The SUPERVISOR of the employee(s) performing the work shall:

Identify the line break point for each isolated section that may contain a solid, liquid, or gas by wrapping the point(s) with line break tape. If necessary, review job preparations and isolation methods with the Equipment Owner to jointly agree on the location of line break point(s).

** See Storestock item # 28-909-0412 for Line Break Tape.

4.2.1 Provide appropriate Job Safety Instruction including:
4.2.1.1 Scope of work
4.2.1.2 Location of other green tape in the vicinity to reduce confusion.
4.2.1.3 Equipment and methods to be used
4.2.1.4 PPE requirements
4.2.1.5 Perimeter barricading requirements
4.2.1.6 Shielding or containment requirements to protect nearby equipment, piping and the environment.
4.2.1.7 Pipe supporting requirements to prevent uncontrolled movement.

4.2.2 Sign and date the "Job Ready" tag indicating acceptance of the job.

4.3 **EMPLOYEES assigned to perform the work shall:**

4.3.1 Participate in the Lockout Procedure as outlined in Safety Procedure 6.

4.3.2 Prior to beginning the work, verify operability of closest safety shower/eye wash station.

4.3.3 Utilize required Personal Protective Equipment on the initial break into an isolated section and any subsequent breaks when it could be reasonable to expect trapped material, such as in the case of a low point in the line. **Ensure PPE is in good condition and no noticeable defects that would expose you to the hazard**

4.3.4 Treat all lines as if they are under pressure. Break flanges "down and away" (out of the line of fire). The initial break should be made over containment whenever possible. Be prepared to re-tighten bolts if the line is not clear.

4.3.5 When breaking into an isolated section, the discovery or suspicion of plugged or pressurized equipment or piping requires that work be stopped and operations personnel be consulted to develop a plan for unplugging and de-pressureizing.

4.3.6 PPE requirements may be down graded when it has been verified that the risk has been eliminated.

4.3.7 After the successful break has been made the line break tape shall be removed.
4.4 When the equipment repairs, adjustments, etc. are completed, the equipment shall be given back to operations in accordance with Safety Procedure 6 (Lockout Procedure).
**Administrative Controls & Personal Protective Requirements**
For Line Breaking Procedure

<table>
<thead>
<tr>
<th>Chemical</th>
<th>PPE (Minimum) *</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Warning</strong> – High temperature (&gt; 140 degrees F) and extremely low temperature (&lt;32 degrees F) materials pose additional hazards not addressed by this procedure.</td>
<td></td>
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<tr>
<td>Chlorine Liquid</td>
<td>Airline Respirator, CPF III, Chemical Gloves and Boots. Standby Operator with “ready to don” Supplied air or SCBA. Verify line is clear before downgrading PPE.</td>
</tr>
<tr>
<td>Chlorine Gas</td>
<td>Airline respirator, Chemical Gloves.</td>
</tr>
<tr>
<td>Chlorinated Organics</td>
<td>Airline Respirator, CPF III, Chemical Gloves and Boots</td>
</tr>
<tr>
<td>Caustic</td>
<td>Goggles and Face Shield, Chemical Slicker Suit/CPF III, Chemical Gloves and Boots.</td>
</tr>
<tr>
<td>Acid</td>
<td>Goggles and Face Shield, Chemical Slicker Suit/CPF III, Chemical Gloves and Boots.</td>
</tr>
<tr>
<td>Sulfur Chloride</td>
<td>Airline Respirator, CPF III (Specifically Model 3T438), Store Stock #283500230-Small, #283500235-Medium, #283500240-Large; Chemical Gloves and Boots. All skin must be covered. Standby Operator with “ready to don” Supplied air or SCBA. Verify line is clear before downgrading PPE.</td>
</tr>
<tr>
<td>Molten Sulfur</td>
<td>Goggles and Face Shield, Cotton Coverall under CPF III Thermal / Chemical Gloves</td>
</tr>
<tr>
<td>Steam or Condensate (unless cool to the touch)</td>
<td>Goggles and Face Shield, cotton coveralls under Slicker Suit, Thermal / Chemical Gloves</td>
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<tr>
<td>Ethylene, Methane and Hydrogen</td>
<td>Goggles and Face Shield, Fire Retardant Clothing</td>
</tr>
<tr>
<td>Air, Nitrogen or water below 120° F</td>
<td>Goggles</td>
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<tr>
<td>Other Material not listed</td>
<td>Refer to appropriate MSDS and Department Supervision</td>
</tr>
</tbody>
</table>

**NOTE:** This equipment has been identified as the minimum level of protection required for the initial break into a system. Each situation must be evaluated and addressed based on the particular circumstances. In some cases additional PPE will be needed. For example, when the initial break is made overhead a chemical hood should be used.

* Refer to Safety Specifications - PPE - for specific types of approved PPE.