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Line Breaking Policy

PURPOSE

It is the policy of the Escanaba Mill that all individuals involved in line breakage and equipment opening, for any reason, shall comply with the Line Breakage Policy.
This policy also establishes requirements that go beyond isolation, flushing, and lockout to require the proper personal protective equipment (PPE) and equipment needed to safely complete line breaking activities. All lines or systems must be assumed to contain a hazard.

This procedure applies to all Escanaba employees and contractors involved with preparing and performing line breaking activities. When process lines, pumps, vessels, tanks, or any other equipment are opened and/or disassembled and have the potential to contain a hazardous material or physical hazard, the Line Breaking Policy shall apply. A line breaking permit is not required if neither a hazardous material or physical hazard is present.

DEFINITIONS

Line Breaking: The intentional opening of a pipe, line, duct, vessel, pump or system that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury. This includes all previously abandoned equipment as well.

Isolation: Preventing all energy sources from moving the equipment or entering the work area. Electrical energy sources require the circuits to be in the open position. Non-electrical energy sources require the energy sources to be blocked to prevent the transfer of energy from the source to the equipment or work area. This includes one of the following:

- double block and bleed
- block and bleed
- double/multiple block
- single block arrangements
- misaligning or removing sections of piping
- blinding
- blocking or disconnecting mechanical linkages

Hazardous Material: Any substance or mixture of substances having properties capable of producing hazardous effects on the health or safety of a human. Typical materials considered hazardous (list is not all inclusive):

- acids
- caustics
- hydrogen peroxide
- black, green, white liquors
- weak wash
- biocides
- chlorine
- chlorine dioxide
- methanol
- foul methanol

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- gasoline
- natural gas
- sodium chlorate
- concentrated vent gases
- aqua ammonia
- sodium hypochlorite
- materials with extreme temperatures
- when an engulfment potential is present

Physical Hazard: A condition where temperature is =/> 120°F or pressure is =/> 90psi.

TRAINING REQUIREMENTS

Each member involved in initial opening or disassembly of lines, pumps, vessels or any other equipment shall be annually instructed on provisions and requirements of this Line Breaking Policy.

Personnel performing line breaking work must also be trained periodically on the following:

- The Control of Hazardous Energcy (Lockout/Tagout)
- Respiratory Protection (when applicable)
- Hazard Communication / SDS review
- Direct reading instruments/meters, i.e., LEL, CLO2, O2
- Contractors must complete an annual Escanaba site-specific orientation

POLICY REQUIREMENTS

Area Supervision or the Contractor Supervisor

- Responsible for ensuring that all piping and equipment is prepared for line breaking work unless arrangements are made to transfer this responsibility to maintenance or contractors.
- Responsible for personnel performing the line breaking work, ensuring that personnel have been properly trained in accordance with this policy.
- Must sign the permit prior to the start of work, signatures shall not be made on the permit until the job has been fully reviewed in the field prior to the start of work and initial atmospheric testing has been completed.
- Must verify that any other necessary safety policies are being followed in combination with this policy as needed (ie Confined Space Policy, The Control of Hazardous Enegry Policy, How Work Policy, etc.).
- Shall notify area operating personnel of line breaking work scheduled to begin in the operating area.

Area Operating Personnel

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- Shall be notified by the Area Supervisor prior to the issuance of a permit, that line breaking work is scheduled to begin in their operating area.
- Operations shall properly clean and prepare the equipment prior to releasing the piping or equipment to maintenance or contractors performing the line breaking work.
  - Equipment preparation and cleaning procedures to remove all harmful substances will be used. Rinsing, steaming, and flushing with hot and cold water are examples of cleaning methods.
  - The objective of the cleaning/flushing process is to eliminate or minimize the potential for exposure to hazardous material or physical hazards.
- Operations shall properly isolate the equipment prior to releasing the piping or equipment to maintenance or contractors performing the line breaking work.
  - Equipment isolation of all energy sources associated with the piping/equipment must be completed in accordance with the mill's Control of Hazardous Energy (LOTO) Policy.
  - Control valves in general, are not designed and should not be used for isolation purposes in lockout associated with line breakage. When considering the use of automated isolation valves (or certain control valves designed for isolation) as part of the lockout process, an individual knowledgeable in the actuation characteristics of a specific valve application must be involved when evaluating the potential hazards and acceptable isolation steps taken.

Personnel Performing Line Breaking Work/Tasks

- Responsible for wearing appropriate personal protective equipment (PPE) as specified by this policy or an area or process-specific Standard Operating Procedure (SOP) during the initial line break and until the line, vessel, pump, packing, or system is verified as clear of hazards.
- Must obtain authorization from Supervision prior to initiating the line breaking process.
- Required to complete a Line Breaking Permit any time a process line, vessel, pump, packing, or process system is going to be opened or worked on.
- Must comply with special instructions given as part of the work by the Area or Maintenance Supervisor or Safety Department.
- Initial atmospheric testing must be completed by the Line Breaker or Attendant prior to the Supervisor signing the permit. If material inside the line break equipment contains any of the following, it must be monitored: Chlorine Dioxide (CLO2), Chlorine (CI2), Carbon Monoxide (CO), Hydrogen Sulfide (H2S), Sulfer Dioxide (SO2) and/or Ammonia (NH3). If line breaking is conducted on a tank or vessel that is considered a confined space, the mill's Confined Space Policy must be followed.

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- Where hazardous gases may be released, air monitoring must take place during the line breakage or equipment opening procedure and continue until there is no longer a potential for the release of gas. If a potential hazardous gas cannot be monitored with existing mill equipment, alternate procedures utilizing PPE, exhaust fans, etc. must be implemented.

Permits

- Valid for one crew or shift only, for a maximum of 12 hours
  - If the crew changes during the 12-hour period, a new permit must be issued for the new crew to continue work on the same job.
  - If the Supervisor changes during the 12-hour period, the incoming Supervisor shall review the job and sign-off on the existing permit.
- In the event of any fixed area emergency chemical sensors or alarms sounding (with the exception of testing), all permits are suspended until re-verification of acceptable permit conditions and re-authorization (initialing by Supervision) of a permit is completed.
- If the work area has been left unattended for more than 1 hour, the permit is suspended until re-verification of acceptable permit conditions and re-authorization (initialing by Supervision) of the permit is completed.
- Permits shall be available at the work site at all times during the work period.
- All permits shall be returned to the Area Supervisor after work completion to communicate that the work has been completed. All completed permits shall be forwarded to the Safety Department.

1. <u>LINE BREAKING TECHNIQUES AND HAZARDS</u>
   When breaking a line or flanged equipment, loosen bolts opposite of your position to relieve any unexpected pressure.

   When removing a pull out design pump, always leave one bolt on either side of the pump and slowly back them out as the pump is separated from the housing to safely relieve any unexpected pressure.

   When it is necessary to remove a valve bonnet, the valve must be in the OPEN position before loosening the bonnet bolts or removing the valve from the flange.

   When removing a man-way cover on a tank, keep the top bolts in place until it is verified that there is no build up of pressure or hazardous materials on the other side of the man-way that could leak or spray out in the direction of the workers.

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When cleaning and inspecting inline instruments, be aware of risks associated with the following hazards:

- pH
- Brightness
- Conductivity
- Consistency Meters
- Level Transmitters

If you can't verify the process is fully drained, consider the risks associated with the following hazards:

- Drains are sealed to another process
- No siphon break and can't drain
  Drain plugged up
- Process was drained hours before work was started

2. PPE REQUIREMENTS

The following four material classes and assigned PPE are to be used during initial line-breaking and until the continuing presence or possible exposure to hazardous materials has been eliminated. Once it is verified that the chemical, pressure, or hazard is not present, the level of PPE may be reduced.

Class I Materials

Examples (not an all inclusive list):

- Any Unknown Material
- Ammonia
- Chlorine
- Chlorine Dioxide
- Foul Condensate or Hot Well Condensate lines must be evaluated on an individual basis to determine the level of risk associated with inhalation and/or skin absorption exposure (includes the following sources and/or receivers but is not an all inclusive list):
  - Accumulator
  - Stripper Feed Column
  - Stripper to Kiln
  - Hot Well at the Incinerator
  - #2 Surface Condenser
  - Turpentine Decantor Condensate

PPE Required

- Respirator - Following a pre-job safety conversation between the employees and supervision involved, it will be determined if a full face respirator with proper canisters is sufficient for breaking the line. A self contained breathin apparatus (SCBA) may be required if gas is present.

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- Air Monitor - must be utilized if wearing a respirator so if gas is detected, the area can be evacuated immediately. Employees cannot return until the gas clears or an SCBA is worn.
- Full skin protection with hood – includes one of the following:
  - Full rain suit with hood,
  - Acid suit with hood, or
  - Tyvek Saranex laminated suit (disposable) with hood
- Neoprene gloves must be tucked under the sleeves of the suit and taped at the wrist.
- Rubber boots with suit pulled over top of boot.

Class II Materials

Examples (not an all inclusive list):

- Sodium Hydroxide (caustic)
- Acid (Muriatic, Hydrochloric, Sulfuric or Sulfamic)
- Hydrogen Peroxide (see SOP's for RMP and Kraft Mill)
- Sodium Chlorate (see SOP's for Kraft Mill)
- Biocide
- Methanol
- Liquor (White, Black or Green)
- Turpentine
- Any material present with an immediate skin hazard

PPE Required

- Goggles and a face shield (safety glasses may be substituted if face shield has chin/splash protection).
- Full skin protection with hood – includes one of the following:
  - Full rain suit with hood,
  - Acid suit with hood, or
  - Tyvek Saranex laminated suit (disposable) with hood.
- Neoprene gloves must be tucked under the sleeves of the suit and taped at the wrist.
- Rubber boots with suit pulled over top of boot.

Class III Materials

Examples (not an all inclusive list):

- Total Reduced Sulfur (TRS) Gases
- Stripper Gases

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- Non-Condensable Gases (NCGs)

PPE Required

- Respirator - Following a pre-job safety conversation between the employees and supervision involved, it will be determined if a full face or half mask respirator with proper canisters is sufficient for breaking the line. A self contained breathin apparatus (SCBA) may be required if gas is present.
- Goggles are required if using a half mask respirator.
- Air Monitor - must be utilized if wearing a respirator so if gas is detected, the area can be evacuated immediately. Employees cannot return until the gas clears or an SCBA is worn.
- Neoprene gloves

Class IV Materials

Examples (not an all inclusive list):

- Steam and Condensate
- Any material with the potential to release or splash causing a thermal burn
- Water or any other flowable material with a temperature =/> 120°F.

PPE Required

- Goggles and a face shield (safety glasses may be substituted if face shield has chin/splash protection).
- Full skin protection with hood – includes one of the following:
  - Full rain suit with hood,
  - Acid suit with hood, or
  - Tyvek Saranex laminated suit (disposable) with hood.
- Thermally insulated rubber gloves.
- Cooling/ice vests must be worn when working in high temperature work environments.

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3. PROGRAM EVALUATION
   Audits will be conducted on a period basis to ensure effectiveness of the policy.

4. REVISION HISTORY

REVISION	PAGE(S) AFFECTED	DATE	DESCRIPTION OF CHANGE
01	Section 3.1	8/17/15	Temperature and pressure requirements
02	Entire Policy	12/24/18	Minor verbiage changes, redid permit and added it to the policy.

5. APPENDIXES & REFERENCES
   United States Department of Labor
   Occupational Safety and Health Administration
   Standard: 1926.64 Process safety management of highly hazardous chemicals

   Appenix A - Line Breaking Permit

Verso Escanaba Mill Line Breaking Permit

This permit must be filled out for any process line, pump, vessel, tank or other equipment is to be opened and/or disassembled for the first time or any time thereafter when the potential exists for injury due to the possbile contents of the line or equipment. This permit must be utilized for all line breaking operations conducted on the millsite.

Date:	Start Time: am/pm	Time End: am/pm
Department/Area:	Physical Location:	
Equipment:	Breaker/Attendant (print):	

PREPARATION & AWARENESS	Yes	No	N/A		Yes	No	N/A
(1) All applicable energy sources (valves, pumps, power) isolated, disconnected & locked-out				(9) Confined space and/or hot work permits completed and signed			
(2) Lines drained/vented/depressurized/rodded				(10) Air monitoring equipment utilized			
(3) Lines flushed and equipment cleaned prior				(11) Non-sparking tools in use: oxygen & methanol			
(4) System cooled down				(12) Pre-job Huddle performed			
(5) Blanks/blinds flanges installed and the locations tagged/locked				(13) Safe egress planned, safety shower and water hose, spray can or fire extinguisher available			
(6) Perform radio and/or phone communication check(s) with security or control room				(14) Employees familiar with chemical hazards and/or SDS reviewed before work			
(7) Barrier tape used to prevent unauthorized entry				(15) Reviewed tanks, hoppers and boilers when opening for attached solid materials (ash, clinkers, stock, etc) from above			
(8) Utilize additional personnel for safety							

CONTINUOUS AIR MONITORING (Circle all that apply for line break and monitor - indicate initial result(s) below)

Lower Explosive Limit Carbon Monoxide Hydrogen Sulfide Oxygen Ammonia Sulfur Dioxide Chlorine Chlorine Dioxide

Time of Initial Air Monitoring Results: _____ am/pm

Results: LEL:_____ CO_____ H2S_____ O2: _____ NH3: _____ SO2: _____ Cl2: _____ ClO2: _____

PERSONAL PROTECTIVE EQUIPMENT (PPE) - See Line Breaking Policy or Area SOPs for specific details

Class I Materials - Check all that apply:			
☐	Ammonia	☐	Foul condensate/hot well condensates
☐	Chlorine	☐	Any unknown material
☐	Chlorine dioxide	☐	
Class II Materials – Check all that apply:			
☐	Sodium Hydroxide (caustic)	☐	Hydrogen Peroxide
☐	Acid (Muriatic, Hydrochloric, Sulfuric, Sulfamic)	☐	Sodium Chlorate
☐	Biocide	☐	Turpentine
☐	Methanol	☐	Any Material Present with an Immediate Skin Hazard
☐	Liquor (White, Black or Green)	☐	
Class III Materials – Check all that apply:			
☐	Total Reduced Sulfur (TRS) Gas	☐	Non-Condensable Gas (NCGs)
☐	Stripper Gas	☐	
Class IV Materials - Check all that apply:			
☐	Steam	☐	Condensate
☐	Water or Flowable Material =/> 120°F	☐	Any Material with Potential to Cause a Thermal Burn
Required PPE – Check all that apply:			
☐	Half Mask Respirator	☐	Air Monitor
☐	Full Face Respirator	☐	Full Skin Protection Suit with Hood
☐	Goggles	☐	Neoprene Gloves
☐	Face Shield	☐	Thermally Insulated Rubber Gloves
☐	Cooling/Ice Vest	☐	Rubber Boots under Full Suit
☐	Other:	☐	Other:
☐	Other:	☐	Other:

By printing my name below, I approve of the work to be done based on the precautions taken and confirm that conditions are as safe as possible prior to the start of work. All equipment, preparation and PPE have been verified as complete by the authoring person(s).

Approved By Line Breaker/Attendant (Print): _____ Time: _____ am/pm

Approved By Supervisor (Prod/Maint) or Lead Operator (Print): _____ Time: _____ am/pm

Approved By Contractor Supervisor (Print): _____ Time: _____ am/pm

Permit must be signed prior to the start of work. Completed permits shall be sent to the Safety Department MB 51.