	FIRST BREAK ALL-AOA-00-000-HST-0017	Retention Code: CG01 - CA
		Revised: February 2020
Owner: HSE Operations	Approved By: Manager, Health & Safety Operations	Review Frequency: Five years or less
<i>This document contains proprietary information belonging to ConocoPhillips Canada. It is intended to govern activities of ConocoPhillips Canada employees and contractors who perform work at ConocoPhillips Canada worksites. Its most current version may only be relied upon by those parties who receive a copy provided by ConocoPhillips Canada directly.</i>		

About this Standard	3
Purpose	3
1. Work Planning	4
1.1. Overview	4
First Break is	4
Completed by	4
First break procedure applies	4
First break procedure does not apply	4
1.2. Hazards	5
Potential hazards	5
Hazardous pressures or fumes	5
1.3. Prework	5
Prior to conducting first break	5
Tools and equipment required	5
Defenses	6
Respiratory protective requirements	7
Deviations from requirements	8
2. First Break Procedure	9
Prepare for First Break	9
Pre-job activities	9
First break on Flanges Procedure	10
Perform first break	10
First Break on Vents or Drains Procedure	11
Perform first break	11
References	12

Document History

Date	Approved by	Change Summary
February 2020	David Reaich	Usability Mapped – Issued for Use

About this Standard

Purpose

The purpose of this standard is to set the minimum requirements of when and under what conditions respiratory protection is required when breaking into process systems.

First break is used in combination with the Respiratory Protection Standard and ensures:

- Reducing exposure to hazardous fluids, gases or vapors during the initial opening of piping, equipment or vessels that have been removed from service.
 - Sources of sour gas or other toxic substances are identified, and defenses implemented to reduce exposure risk.
-

1. Work Planning

1.1. Overview

<p>First Break is</p>	<p>First break is the act of breaking the integrity of process piping or equipment that may contain toxic or hazardous products. It is a planned loss of containment where there is potential for trapped pressure, or exposure to a toxic commodity or unknown material.</p>
<p>Completed by</p>	<p>First break is typically completed by:</p> <ul style="list-style-type: none"> • Operations – drain / depressurize equipment prior to LOTO. • Maintenance and Construction – break a flange or open a valve on a line containing H₂S, benzene or other toxic substances.
<p>First break procedure applies</p>	<p>First break procedure applies to the following conditions:</p> <ul style="list-style-type: none"> • Toxic piping, process equipment and /or other equipment with toxic or noxious products e.g., H₂S, acid, caustic, benzenes, etc., Refer to Respiratory Protective Requirements for guidance. • Equipment / piping with unknown concentrations of toxic or noxious materials. • When removing a blank or a blind, if the absence of trapped pressure or atmospheric hazards cannot be proven, the First Break Procedure must be followed. • When removing a cap or plug from an engineered vent or drain where process stream contains acid, caustic and mercaptan.
<p>First break procedure does not apply</p>	<p>First break procedure does not apply when:</p> <ul style="list-style-type: none"> • Sampling • When removing a cap or plug from an engineered vent or drain, where the cap or plug is isolated from the process stream by a manual valve.

1.2. Hazards

Potential hazards

The following hazards should be considered, and defenses implemented for:

- Fires associated with flammable gases, liquids or vapours
- Source of ignition e.g., sparking or static electricity, open flame, iron sulphide
- Toxic vapours or corrosive substances e.g., H₂S, acid, caustic, benzene
- High temperature, high pressure fluids, gases or vapours
- Static electric charges.

Hazardous pressures or fumes

A vent or drain can be the first break into a system. If a vent or drain valve test has proven first break is free of hazardous pressures or fumes, then any flange following is considered a second break. A second break can be done provided a proper hazard assessment has been performed.



WARNING: A second break must be treated as first break if there is an equal risk of exposure to trapped pressure potential.

1.3. Pework

Prior to conducting first break

Confirm the following prerequisites prior to conducting first break:

- Ensure positive or a proven isolation is in place before breaking containment of a system. This includes opening a drain / vent valve or breaking a flange (LSR: Verify Isolations).
- Implement defenses against Line of Fire hazards
- Apply personal locks to the isolation lock box.
- Obtain a Safe Work Permit if needed (LSR: Work with a valid permit when required).
- Use spill containment under every flange to be broken or drain to be opened.

Tools and equipment required

The following tools and equipment may be required for first break work:

- Spill containment
- Portable eye wash and safety shower
- Proper wrenches (no crescent wrenches)
- Flange spreaders
- Pipe supports
- Respiratory protective equipment
- Benzene monitor and 4-head continuous gas monitor
- Rodding tool

Defenses

Defenses including the following examples should be considered for first break:

Defense	Consideration
Safe Work Practices	<ul style="list-style-type: none"> • Worker performing the first break will conduct a work permit, PJHA, field level hazard assessment (FLHA) or local process. • Consider how long the system has been isolated as this may increase potential for exposure to trapped fluids or hazardous atmospheres. • Completed Safe Work Permit listing all hazards and defenses for maintenance and construction personnel. • Work activity is to ensure that line of fire, product temperature hazards are considered and mitigated before any work starts. • A Standby Person with a SCBA or SABA must be present during first break. Standby Person must be ready to go under air. e.g., if monitoring from a safe location, they should be packed up ready to go but does not need to have the mask on.
Communication	<ul style="list-style-type: none"> • Two-way radio communication must be established. • Operations must be notified of all first breaks before performing.
PPE	<ul style="list-style-type: none"> • SABA or SCBA must be worn at first break – Most work is completed using SABA. SCBA is only used in emergency situations when SABA is not practical. • Chemical proof rain suit, gloves, face shield (hot sampling PPE) if the product is >55°C. • Any other specialized PPE required by Safety Data Sheets (SDS).
Atmospheric testing	<ul style="list-style-type: none"> • Gas monitors must be bumped and calibrated within the specified time (bumped every 24 hours, calibrated every 90 days).
Spill prevention	<ul style="list-style-type: none"> • Spill containment must be placed under all flanges, drains, equipment to be broken.

Respiratory protective requirements

Categories (red, yellow, green) are based on the Isolation Standard, SDS, likelihood of trapped pressure testing by Industrial Hygiene.

Respiratory protective requirements are as follows:

Commodity	Respiratory Protection Requirements
Produced emulsion	Operations and Maintenance must pack up when breaking equipment integrity <ul style="list-style-type: none"> Operations will pack-up and remain protected until atmospheric testing has confirmed the absence of hazardous substances. Maintenance personnel are required to pack-up and remain protected when breaking into the same system until additional testing has confirmed the absence of hazardous substances. *Diluent applies to condensate or others known to have high benzene.
Produced gas	
Mixed fuel gas	
Recycle slop oil	
Sulfite / O ₂ Scavenger	
Flare Header / HP Flare	
Diluent*	
Hydrochloric Acid	Operations must pack up when breaking equipment integrity. <ul style="list-style-type: none"> Operations will pack-up and remain protected until atmospheric testing has confirmed the absence of hazardous substances. Maintenance personnel are not required to pack-up and remain protected when breaking into the same system.
Mercaptan (gas odorant)	
Produced Water	
Sodium Hydroxide (Caustic Soda)	
Sulfur Dioxide (SO ₂) Amine	
Produced / Sales Oil	
Synthetic Crude Oil	SABA / SCBA is generally not required for breaking equipment integrity: <ul style="list-style-type: none"> SDS and RPE Selection Chart must be consulted to ensure workers are protected against exposure. Diluent, Synthetic Crude Oil, and other Benzene containing commodities may require SABA / SCBA based on concentrations outlined in the Benzene Code of Practice.
Hydrated Lime / Lime Slurry	
Natural Gas (TCPL)	
Lift/Fuel/Blanket/Purge Gas	
Methanol	
Soda Ash / Soda Ash Slurry	
Steam	
Steam Condensate	
Boiler Feed Water/Backwash water	
De-mulsifier (Emulsion Breaker)	

Continued on next page ...

... continued from previous page.

Glycol	<p>SABA / SCBA is not required for breaking equipment integrity:</p> <ul style="list-style-type: none"> • Packing-up is not required for first break. • SDS and RPE Selection Chart must be consulted to ensure workers are protected against unwanted exposure.
Varsol	
Potable Water	
Instrument Air	
Utility Air	
Utility Water / Fire Water	
Saline Water	
Magnesium Oxide (MagOx)	
Reverse Demulsifier (REB)	
Floculant	
Coagulant	
Polymer	
Chelant / Scale Inhibitor	
Blowdown (Disposal)	
Raw Water	
Brine	
Nitrogen (N ₂)	
Hypochlorite	
Filming Agent (Filming Amine)	
Carbon Dioxide (CO ₂)	

Deviations from requirements

Any deviations from the listed requirements must be risk assessed and approved by the proper approval level based on the residual risk.

2. First Break Procedure

Prepare for First Break

Pre-job activities



Pre-job activities are as follows:

Step	Action										
1.	Confirm the following:										
	<table border="1"> <thead> <tr> <th>Item</th> <th>Check</th> </tr> </thead> <tbody> <tr> <td>Line is isolated.</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Spill containment is placed under any flange or drain valve.</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Anyone working in the area that may be affected is notified.</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Location of eye wash station and safety shower. Use a portable eyewash station if necessary.</td> <td><input type="checkbox"/></td> </tr> </tbody> </table>	Item	Check	Line is isolated.	<input type="checkbox"/>	Spill containment is placed under any flange or drain valve.	<input type="checkbox"/>	Anyone working in the area that may be affected is notified.	<input type="checkbox"/>	Location of eye wash station and safety shower. Use a portable eyewash station if necessary.	<input type="checkbox"/>
	Item	Check									
	Line is isolated.	<input type="checkbox"/>									
	Spill containment is placed under any flange or drain valve.	<input type="checkbox"/>									
Anyone working in the area that may be affected is notified.	<input type="checkbox"/>										
Location of eye wash station and safety shower. Use a portable eyewash station if necessary.	<input type="checkbox"/>										
2.	Identify the following:										
	<table border="1"> <thead> <tr> <th>Item</th> <th>Check</th> </tr> </thead> <tbody> <tr> <td>Proper SDS for product in the line to determine appropriate PPE and first aid measures.</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Safe atmosphere levels required to remove SABA / SCBA based on product in the line.</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Wind direction to place body upwind when performing first break.</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Safe means of evacuation.</td> <td><input type="checkbox"/></td> </tr> </tbody> </table>	Item	Check	Proper SDS for product in the line to determine appropriate PPE and first aid measures.	<input type="checkbox"/>	Safe atmosphere levels required to remove SABA / SCBA based on product in the line.	<input type="checkbox"/>	Wind direction to place body upwind when performing first break.	<input type="checkbox"/>	Safe means of evacuation.	<input type="checkbox"/>
	Item	Check									
	Proper SDS for product in the line to determine appropriate PPE and first aid measures.	<input type="checkbox"/>									
Safe atmosphere levels required to remove SABA / SCBA based on product in the line.	<input type="checkbox"/>										
Wind direction to place body upwind when performing first break.	<input type="checkbox"/>										
Safe means of evacuation.	<input type="checkbox"/>										

First break on Flanges Procedure

Perform first break

Perform first break as follows:


Step	Action						
1.	Don SABA or SCBA.						
2.	Position yourself upwind with a clear evacuation route.						
3.	<p>Loosen nuts until flange is proven to be open.</p> <div style="border: 2px solid orange; padding: 5px; display: inline-block;">  <p>CAUTION: Always assume the line is charged unless proven otherwise. Always loosen nuts on the opposite side of the flange that you are positioned on.</p> </div>						
4.	Confirm nuts remain on flange bolts until zero energy is proven.						
5.	<p>Complete based on the following:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">If</th> <th style="width: 50%;">Then</th> </tr> </thead> <tbody> <tr> <td>Fluid or gas is encountered and does not dissipate quickly</td> <td>Tighten flange back up and re-assess the situation</td> </tr> <tr> <td>Fluid or gas is encountered and dissipates quickly or not fluid or gas is encountered</td> <td>Capture all fluids</td> </tr> </tbody> </table>	If	Then	Fluid or gas is encountered and does not dissipate quickly	Tighten flange back up and re-assess the situation	Fluid or gas is encountered and dissipates quickly or not fluid or gas is encountered	Capture all fluids
	If	Then					
	Fluid or gas is encountered and does not dissipate quickly	Tighten flange back up and re-assess the situation					
Fluid or gas is encountered and dissipates quickly or not fluid or gas is encountered	Capture all fluids						
6.	<p>Test atmosphere with 4-head continuous gas monitor and benzene monitor.</p> <div style="border: 2px solid gray; padding: 5px; display: inline-block;">  <p>NOTE: Do not use your personal gas monitor as it is not continuous.</p> </div>						
7.	<p>Complete based on the following test result:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">If</th> <th style="width: 50%;">Then</th> </tr> </thead> <tbody> <tr> <td>Atmosphere is proven safe</td> <td>SABA / SCBA can be removed</td> </tr> <tr> <td>If atmosphere is not at safe levels</td> <td>Refer to RPE selection chart for ongoing respiratory requirements (benzene)</td> </tr> </tbody> </table>	If	Then	Atmosphere is proven safe	SABA / SCBA can be removed	If atmosphere is not at safe levels	Refer to RPE selection chart for ongoing respiratory requirements (benzene)
	If	Then					
Atmosphere is proven safe	SABA / SCBA can be removed						
If atmosphere is not at safe levels	Refer to RPE selection chart for ongoing respiratory requirements (benzene)						

First Break on Flanges Procedure is complete.

First Break on Vents or Drains Procedure

Perform first break

Perform first break as follows:

Step	Action						
1.	Don SABA or SCBA.						
2.	Position yourself upwind and out of the line of fire with a clear evacuation route.						
3.	<p>Open the drain valve slowly.</p> <div style="border: 2px solid orange; padding: 5px; display: inline-block;">  <p>CAUTION: Always assume the line is charged until proven otherwise. Stay clear of the line of fire.</p> </div>						
4.	Confirm all liquids are captured in spill containment.						
5.	Open drain valve fully to remove all fluids and pressure if conditions permit.						
6.	Capture all fluids.						
	<table border="1"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>Fluid or gas is encountered and does not dissipate quickly</td> <td>Close valve and re-assess the situation</td> </tr> <tr> <td>Fluid is encountered</td> <td>Control the potential release of fluid and prevent a spill</td> </tr> </tbody> </table>	If	Then	Fluid or gas is encountered and does not dissipate quickly	Close valve and re-assess the situation	Fluid is encountered	Control the potential release of fluid and prevent a spill
	If	Then					
Fluid or gas is encountered and does not dissipate quickly	Close valve and re-assess the situation						
Fluid is encountered	Control the potential release of fluid and prevent a spill						
7.	Utilize rodding tool to confirm valve is clear of obstructions.						
8.	Test atmosphere and complete based on the result:						
	<table border="1"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>Atmosphere is proven safe</td> <td>SABA / SCBA can be removed</td> </tr> <tr> <td>If atmosphere is not at safe levels</td> <td>Refer to RPE selection chart for ongoing respiratory requirements (benzene)</td> </tr> </tbody> </table>	If	Then	Atmosphere is proven safe	SABA / SCBA can be removed	If atmosphere is not at safe levels	Refer to RPE selection chart for ongoing respiratory requirements (benzene)
	If	Then					
Atmosphere is proven safe	SABA / SCBA can be removed						
If atmosphere is not at safe levels	Refer to RPE selection chart for ongoing respiratory requirements (benzene)						

First Break on Vents and Drain Procedure is complete.

References

Reference the following documents as required.

Document Name	Document ID
Isolation Standard	TBD
Personal Protective Equipment Standard	TBD
Respiratory Protection Standard	TBD