	HOT WORK ALL-A0A-00-000-HST-0001	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	4
Purpose	4
1. Hot Work Types and Permits	5
Types of Hot Work requiring permits	5
What are hydrocarbon sources	6
Activities not considered Hot Work	6
Diesel Vehicle Engines	6
Defenses Required	6
1.1. Preparing Work Area	7
Precautions to prevent fire	7
Fire extinguishers	7
1.2. Preparing Equipment	7
Isolate, clean and purge	7
Welding and Cutting equipment	8
1.3. Safety Shutdown Devices	8
Out of view of fire eyes	8
Bypassing safety shutdown devices	8
1.4. Barricades	8
Type A Hot Work Barricades	8
2. Conducting Hot Work	9
2.1. Work Permits	9
Work Permits for Type A and Type B Hot Work	9
Work Permits for Non-intrinsically safe electronic devices	9
Work permit duration	10
2.2. Fire Watch	10
When required	10
2.3. Gas Testing	11
Initial Gas Test and atmospheric conditions	11
Continuous monitoring	11
Where to conduct gas testing	11

Documenting Results	11
3. Roles and Responsibilities	12
Specific roles	12
References	13

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 ensure hot work is managed in the safest, most practical manner for all work at sites operated by ConocoPhillips Canada (CPC).

1. Hot Work Types and Permits


Types of Hot Work requiring permits

Hot work types requiring a written permit are as follows:


Hot Work Type	Criteria	Area
A – High Energy	<ul style="list-style-type: none"> Fire or spark producing activities such as welding, cutting, grinding, stress relieving of piping, and / or open flame. 	<ul style="list-style-type: none"> Within 25 meters of a hydrocarbon source. Within 10 meters of combustible material
B – Low Energy	<ul style="list-style-type: none"> Work on electrical circuits, use of electrical tools or equipment e.g., drills, portable generators, etc. motorized equipment (internal combustion engine) 	<ul style="list-style-type: none"> Within 3 meters of a hydrocarbon source
Non-intrinsically safe electronic devices	<ul style="list-style-type: none"> Mobile phones, tablets, cameras, radios, and calibration and testing equipment. 	<ul style="list-style-type: none"> Within 3 meters of a hydrocarbon source



CAUTION: Defenses are required when conducting high energy hot work within 10 meters of combustible material, brush or other locations where wildfires could be sparked.



NOTE: In the case of a building containing hydrocarbon sources, the hot work area extends 3 meters beyond the exterior wall or roof of a building, exhaust vent, low point drain, high point vent of flange.



NOTE: Safe areas can be identified by the local Work Supervisor based on risk assessment and local approval processes. Reference NFPA499 and Hazardous Zone Requirements

Continued on next page ...

... continued from previous page.

What are hydrocarbon sources

Hydrocarbon sources are any flammable liquids or gases produced from or used in the exploration or production of hydrocarbons such as:

- Light oil
- Condensate
- Natural Gas
- Bitumen
- Natural Gas Liquids (NGL)



CAUTION: Leak Points are locations where hydrocarbon sources may be released such as flanges, drains, vents, vessels, tanks, relief valves etc.

Activities not considered Hot Work

Work activities that are out of scope of this procedure:

- Work activities where intrinsically safe tools are used
- Internal combustion vehicle operations on dedicated roads designed for vehicle movement

Diesel Vehicle Engines

Diesel vehicle engines operating within 25 meters of a hydrocarbon source must be equipped with the appropriate positive air shut off devices.

- This does not include vehicles operated on dedicated roads designed for vehicle movement.

Defenses Required

During work planning, ensure defenses are implemented to address the following:

- Explosions
- Fires
- Natural gas / hydrocarbons including entrained or liquids or gases
- Pyrophoric material (i.e. iron sulphides)
- Sparking
- Arc flash
- Toxic Gas
- Combustible Dust



NOTE: Consider the fire triangle when assessing hazards.

1.1. Preparing Work Area

Precautions to prevent fire

All reasonable precautions to prevent fire must be taken prior to starting Type-A High Energy hot work. Consider the following:

Precautions	Details
Remove flammables and combustibles	<p>Isolate or move at least 25 m (75 ft.) from the work area. Examples include but not limited to:</p> <ul style="list-style-type: none"> • Move or protect, unnecessary combustible materials (wood, paper, cardboard, rags, etc. (10 meters) • Move or protect equipment on which hot slag or burning materials may fall. • Place tight covers on all open containers that cannot be relocated. • Place tight covers on all open vessels, tanks, and piping in the area. • Plug bleeder valves on pumps, lines and vessels that contain flammables (hydrocarbons). • Cover manhole and sewer connections. • Ensure container for electrode stubs are available. • Plug sump vents to prevent escape of gases. • Ensure open sumps are pumped out and securely covered to prevent entry of sparks or slag.
Defenses	<ul style="list-style-type: none"> • Use fire retardant hoarding and/or fire blankets, etc. where applicable to fully contain or eliminate hazards including sparks and slag. • Use welding screens and hoardings to protect workers and safety shutdown devices from arc flash. • Keep hot areas damp if heat will be intensive. • Ensure walkways, ladders and other approaches are unobstructed.

Fire extinguishers

At least 1 fire extinguisher must be located within 7.5 meters of the work area for Type A Hot Work activities.

The extinguisher must be a minimum 20 lb. ABC rating.

1.2. Preparing Equipment

Isolate, clean and purge

Ensure equipment is properly isolated, cleaned and purged. Refer to Lockout / Tag Out, Positive Isolation and Purging Procedures for more information.

Mechanical / electrical sources and interlocking systems are disconnected, if required.

Continued on next page ...

... continued from previous page.

Welding and Cutting equipment

Confirm welding and cutting equipment has:

- The required welding and ground leads to securely fasten to the electric supply cable.
- Flashback arrestors installed between torch and regulator on oxyfuel systems.

1.3. Safety Shutdown Devices

Out of view of fire eyes

Fire eye locations must be confirmed. All possible conflicts should be discussed with Operations. Consider:

- Any surface that may reflect a spark or arc flash and initiate an alarm or shutdown.
- Covering all windows to ensure fire eye alarms are not activated.

Bypassing safety shutdown devices

Bypassing safety shutdown devices must be done only when unavoidable. Allow sufficient time to consult with Operations to obtain bypass approvals. Refer to business unit-specific Bypassing Safety Shutdown Devices procedures.

1.4. Barricades

Type A Hot Work Barricades

Barricades and flagging must be installed to prevent unplanned entry and possible Line of Fire hazards within Type A Hot Work areas. The following applies:

- Hazard assessment and permit must address Hot Work carried out at heights.
- Defenses must be installed to prevent dropped objects, sparks, or slag from contacting personnel below.
- Concurrent or SIMOPS work activities must be assessed and mitigated.

British Columbia regulations require the following for barricades:

- Recently conducted hot work must be marked "HOT" or guarded off if workers may make contact with hot material.
- Screens, partitions or curtains must have a non-reflective surface finish when welding.

2. Conducting Hot Work

2.1. Work Permits

Work Permits for Type A and Type B Hot Work

A work permit must be completed before performing Type A or Type B Hot Work. The permit must identify:

- Potential or actual presence of hydrocarbons and ignition sources at or near the work area
- Potential for the release of flammable or noxious gas resulting from hot work
- Atmospheric testing requirements
- Fire watch requirements
- Defenses to prevent ignition of flammable liquids or gases.



NOTE: Pre-Job Hazard Assessments (PJHA) are considered Work Permits per local requirements.



NOTE: In Surmont, Work Area Notifications (WAN's) or General permits may be used for Type B Hot Work per local processes.

Work Permits for Non-intrinsically safe electronic devices

An FLHA (Field Level Hazard Assessment or Hazard Review Card) may be used as a work permit for non-intrinsically safe devices provided:

- The type of equipment, job tasks, hazards, defenses and work location are outlined in the FLHA.
- The FLHA is signed or verbally verified by the local area supervisor.



NOTE: This section only applies to ConocoPhillips Employees or Full Time Equivalent (FTE) personnel. Contractors using electronic devices must follow Type B Hot Work Requirements

Work permit duration

Work permits may be issued for the following durations:

Hot Work Type	Duration
A – High Energy	<ul style="list-style-type: none"> 12 hours: from the issue date and time. Extended shifts are permissible per local permit authority approvals.
B – Low Energy	<ul style="list-style-type: none"> Up to 30 days: reissued each shift, provided daily FLHAs or local hazard review tools are completed.
Non-intrinsically safe electronics	<ul style="list-style-type: none"> Per area as identified by local supervisor.


2.2.Fire Watch


When required


A Fire Watch is required when Type A – High Energy Hot Work is conducted. The work permit and/or hazard assessment will outline if a dedicated Fire Watch is required (such as burring, welding, grinding) or if the role can be filled by a worker (such as combo trucks).

One Fire Watch may monitor more than one activity at the same time if the total work area has a radius of less than 8 m (25 ft.) and /or:

- A clear line of site can be maintained.
- Reaction to an event will not be compromised e.g., congestion.
- A minimum of 1 fire extinguisher is available per person conducting the hot work.

 **NOTE:** A fire watch must remain in place for 30 minutes once Type A Hot Work is complete to ensure no fires or hot spots remain.

 **NOTE:** In the case of mobile equipment with fired heaters (i.e. combo truck), it may be deemed that a fire watch is not required after the work.

 **NOTE:** More than one fire watch may be required where heat can transfer to adjacent spaces above/below/beside.

2.3. Gas Testing

Initial Gas Test and atmospheric conditions

An initial gas test must be conducted to verify atmospheric conditions by the local operator or delegate.

Hot Work will not be initiated and / or will be stopped if the following conditions are identified:

Parameter	Stop if
O ₂	>23.0%
LEL	> 10%

Continuous monitoring

Testing and monitoring must be continuous for the duration of work and documented at a frequency defined on the work permit.

Workers are encouraged to use a frequency 60 minutes based on hazard assessment as a guideline.



NOTE: An aspirated gas monitor is required for Type A Hot Work and a passive gas monitor (personal) is acceptable for Type B Hot Work or non-intrinsically safe electronic device usage.



WARNING: Hot work must be stopped and placed in a safe condition, operations notified, and personnel shall evacuate the area during plan/unit alarms or alarms on either continuous or personal gas monitors.

Where to conduct gas testing

Gas testing should take place as follows:

- in more than one location to gauge the presence of hazardous atmospheric conditions.
- structural piles and under building floors and skids if a buildup of hazardous gas may exist.
- testing flanges, valves, bleeders, drains and other potential hydrocarbon leak sources.

Documenting Results

Results must be documented on or attached to the work permit or applicable FLHA.

3. Roles and Responsibilities

Specific roles

Specific roles for Hot Work are as follows:

Role	Responsibility
Fire Watch	<ul style="list-style-type: none"> • Maintain contact and line of sight with those performing hot work. • Ensure work area is kept wet, as defined on the applicable hazard assessment. • Monitor for fires, extinguishes fires if safe to do so. • Ensure sparks and slag are contained. • Shutdown work activities if conditions change or become hazardous. • Ensure job specific emergency response and rescue procedures are available. • Sound alarm and /or otherwise notify others as necessary e.g., emergency response team (ERT). • Remain on duty for 30 mins after hot work has stopped, work is complete, or another competent person takes over fire watch.
Workers	<ul style="list-style-type: none"> • Understand the potential for and explosion hazards, including mitigation. • Maintain communication with the fire watch. • Understand emergency procedures, roles and responsibilities. • Stop hot work if conditions change from those identified on the hazard assessment. • Ensure a process is in place to confirm welding machines are shutdown at the end of the day.

References

Reference the following documents as required.

Document Name	Document ID
Process Isolation Standard	
Permit to Work Procedure	
Personal Protective Equipment Standard	
Purging Procedure	