ConocoPhillips Canada	**RESPIRATORY PROTECTION** ALL-A0A-00-000-HST-0011	**Retention Code:** *CG01- CA* **Revised:** *February 2020*
Owner: *HSE Operations*	**Approved By:** *Manager, Health & Safety Operations*	**Review Frequency:** *Five Years or Less*

Contents

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 outline safe work requirements related to Respiratory Protective Equipment

1. Respiratory Protection Program

1.1. Respiratory Protection Program Requirements

Personnel in the Program

Personnel in the program have job duties that require them to wear a respirator. Examples include:

- Emergency response activities
- Production and Maintenance
- Brownfield Construction
- Well Drilling/Completions/Servicing

Personnel excluded from the Program

Workers conducting greenfield construction, escorted visitors in areas absent of atmospheric hazards, or personnel not under CPC operational control are excluded from the program. Examples include:

- Regulators
- Auditors
- Office, delivery, and camp/catering personnel
- Security

NOTE: Exceptions may be required based on hazard assessment or local operating conditions.

Clean Shaven Requirements

Personnel included in the respiratory protection program and may be required to don RPE are required to be clean shaven per regulatory requirements.

NOTE: Personnel who are excluded from the program will not have to be clean shaven unless a local hazard assessment indicates otherwise

Fit Testing

Fit testing is quantitative or qualitative following CSA Standard Z94.4-02 and is carried out by trained and certified personnel.

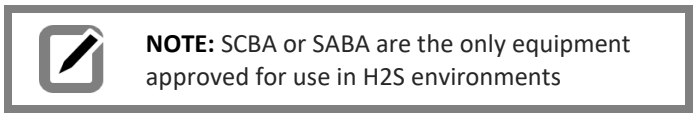
Fit testing is required prior to using respiratory protection, and repeated:

Province	Frequency
Alberta	Every 2 years
British Columbia	Annually

NOTE: Re-testing is required if a new respirator is assigned or in the case of significant weight change, facial injury, or surgery.

Medical Assessment Required	A medical assessment is required for workers in the respiratory protection program and includes: • pre-use and periodic assessments by the occupational health team • completion of a medical self-assessment form • approval regarding use of respiratory protection equipment. • further medical evaluation as required.
Training	Workers must be trained in the use of the assigned respiratory protective equipment. Refresher training on proper fit and seal of RPE is completed during fit testing.

1.2.Selection of Respiratory Protection Equipment

Types of Respiratory Protection Equipment	The following types of respiratory protection are available to personnel:
	• Self-Contained Breathing Apparatus (SCBA, positive pressure)
	• Supplied Air Breathing Apparatus with 5-minute escape bottle (SABA, positive pressure)
	• Air purifying cartridge respirator with organic vapour, particulate or a combination cartridge (i.e. OV and P100)
	  ○ Full face
	  ○ Half face
	 
	NOTE: SCBA or SABA are the only equipment approved for use in H2S environments

SCBA & SABA	When using SCBA and SABA consider the following: • Use SCBAs and SABAs in pressure demand mode or SABAs in continuous flow mode. • Cease work and leave area upon low-pressure alarm • Use a buddy system with a communication plan • The buddy is onsite, equipped, and capable of rescue.

Air Purifying Respirators

When using air purifying respirators ensure the following:

- Respirators are assigned for individual use.
- Individuals clean and maintain respirators.
- the right cartridge is used for the hazard. (i.e organic vapours, ammonia/amines, dusts, mists, or fumes.)

NOTE: Only NIOSH approved masks are permitted.

NOTE: Install new cartridges per local hazard assessment, if breathing resistance increases, or if odor is detected in face piece.

Respirator Selection

Proper respirator selection is based on an assessment of the atmospheric hazards and recommended defenses. Examples are:

Atmospheric Hazard	Concentration	Required RPE
O2	<19.5%.	SCBA or SABA with escape bottle.
LEL	>10% - <20%.	SCBA or SABA with escape bottle
H2S	>10ppm	SCBA or SABA with escape bottle
Benzene	>0.25	Refer to Benzene COP
Dust, mist aerosols, fumes ammonia, amines, etc.		Follow SDS

NOTE: In BC, the use of SCBA or SABA to control flammability hazards is only permitted upon receipt of a variance from the regulator.

CAUTION: Follow manufacturer's instruction for breathing air use in low temperatures.

NOTE: Responding to an emergency, entry in atmospheres >20% LEL by a competent properly equipped worker is permitted.

Face Seal Check

A face seal check is required before starting a task using a respirator. The two types of seal checks are:

- Positive pressure test
- Negative pressure test

The procedure for a Positive pressure test is:

Step	Action
1.	Block exhalation valve with palm of hand
2.	Exhale slightly and note positive pressure in the face piece
3.	If leakage occurs around seal, adjust and retest.

The procedure for a Negative pressure test is:

Step	Action
1.	Block breathing tube, cartridge faces, or remove cartridges
2.	Block apertures connecting to the face piece
3.	Inhale slightly to create a negative pressure inside the face piece – hold breath for 10 seconds.
4.	If leakage occurs around seal, adjust and retest.

NOTE: If a fit cannot be achieved, remove the respirator from service and use alternative RPE.

1.3.RPE Care and Maintenance.

Cleaning, Maintenance, and Storage	Follow the manufacturer's instructions for cleaning, maintenance, and storage requirements and ensure: • Repairs are completed by a manufacturer authorized technician • Routine replacement of headbands, nose cups, filters, and cylinders. • Change inhalation and exhalation valves on air purifying respirators as required. • Prevent cross-connection of breathing air with other air lines • Breathing air couplers should be color-coded, tagged, have alignment marks and a pre-use inspection.
Inspection of SCBA and SABA	Conduct safety and function checks of equipment at least monthly.
Cylinder Safety and Storage	Breathing air cylinder safety and storage requirements are as follows: • Hydro-test composite cylinders every 3 years and steel or aluminum cylinders every 5 years in accordance with CSA Standard Z94.4-M1982. • Bleed down and recharge cylinders not used in a 1-year period • Obtain a breathing analysis report when cylinders are recharged. • Breathing air quality must meet CSA standard Z180.1-00. • Breathing air must have an atmospheric due point <-65 degrees C. • Transport cylinders in a vertical position with valve caps in place.

2. Definitions and Terms.

2.1.Definitions and Terms

Air Purifying Respirator	A respirator which absorbs or filters contaminants from the workplace atmosphere.
Continuous Flow Positive Pressure Regulator	A positive air pressure is maintained inside the respirator face piece at all times during use by a continuous flow of air to the face piece. This type of delivery system is used for hoods (e.g. abrasive blasting hood).
Emergency	A present or imminent event outside the scope of normal operations that requires prompt coordination of resources to protect the health, safety and welfare of people and to limit damage to property and the environment.
Escape Bottle	An auxiliary cylinder of compressed breathing air used in conjunction with an air line respirator. It can be used for emergency egress should the air line become cut or otherwise rendered ineffective. The minimum use duration approved for ConocoPhillips operations is 5 minutes.
Full Face Piece	A face piece which covers the mouth, nose, chin, and eyes.
Half Face Piece	A face piece which covers the mouth, nose, and chin.
Fit Test Qualitative	A test of the seal between the person's face and the respirator face piece in which the person wearing a respirator is exposed to an irritant smoke, odorous vapor, or other suitable test agent. The respirator wearer uses his/her senses to detect leakage of the test agent into the face piece as a means of assessing the effectiveness of the seal to the face.
Fit Test Quantitative	Instrumentation is used to measure the concentrations of a test agent inside and outside the face piece (or pressure differential across the face piece), as a means of assessing the effectiveness of the facial seal.
Hazard Ratio	Only applies to atmospheres which are not oxygen deficient. The concentration of the airborne contaminant present divided by its occupational exposure limit. For example, if the concentration of benzene is2.5 ppm, and the OEL is 0.5 ppm, the hazard ratio is 5. In order to use a type of RPE, its protection factor must be greater than the hazard ratio.
Immediately Dangerous to Life or Health (IDLH)	Any atmosphere where the concentration of oxygen, flammable or toxic air contaminants would cause a person without RPE to be fatally injured, cause irreversible and incapacitating effects to that person's health, or prevent escape from such an environment.

<table>
<tr><td>Maximum Use Concentration</td><td>The maximum use concentration (MUC) is the highest contaminant concentration in air for which the respirator can be used. It depends on the protection factor and the exposure limit for the contaminant: MUC = PF x Exposure Limit</td></tr>
<tr><td>Inert Atmosphere</td><td>Addition of nitrogen, carbon dioxide, or similar gas into a confined space (tank or vessel) which contains an explosive atmosphere in order to make the atmosphere non-explosive by depleting the oxygen concentration.</td></tr>
<tr><td>NIOSH Approval</td><td>Tested according to a standard developed by the National Institute for Occupational Safety and Health (NIOSH) in the United States for use under the conditions stated. An approval number (e.g. TC-19C-, TC-21C- or TC-23C-) is printed on all NIOSH approved equipment. Older equipment may bear joint approval by NIOSH and the Mine Safety and Health Administration (MSHA) or the Mining Enforcement and Safety Administration (MESA). NIOSH/MSHA and NIOSH/MESA approvals are equivalent to NIOSH approval.</td></tr>
<tr><td>Oxygen Deficiency</td><td>An oxygen content in the air of less than 19.5% volume/volume.</td></tr>
<tr><td>Pressure Demand (positive pressure)</td><td>A respirator where the pressure in the face piece or hood remains positive with respect to the ambient pressure during both inhalation and exhalation.</td></tr>
<tr><td>Protection Factor</td><td>The minimum anticipated protection provided by a properly functioning respirator or class of respirators to a given percentage of properly fitted and trained users.
<table>
<tr><th>Respirator Type (NIOSH Approved)</th><th>Protection Factor
from CSA Standard Z94.4-11</th></tr>
<tr><td>SCBA (full face piece) – positive pressure</td><td>10000</td></tr>
<tr><td>SABA (full face piece) – positive pressure</td><td>1000</td></tr>
<tr><td>Air purifying cartridge respirator
- full face piece
- half face piece
- filtering face piece (dust) mask</td><td>
50
10
10</td></tr>
</table></td></tr>
<tr><td>Quick Connect Locking Couplings</td><td>Quick disconnect fittings used to quickly connect air lines without losing air pressure.</td></tr>
<tr><td>Respirator (Respiratory Protection, Respiratory Protective Equipment)</td><td>A device designed to protect the wearer from inhalation of hazardous atmospheres.</td></tr>
<tr><td>Seal Check</td><td>A field check of the respirator facial seal using positive and negative pressure tests.</td></tr>
<tr><td>Self-Contained Breathing Apparatus (SCBA)</td><td>A respirator providing its own independent supply of breathing air from a cylinder carried by the user, usually on the back.</td></tr>
<tr><td>Supplied Air Breathing Apparatus (SABA)</td><td>A respirator providing its own independent supply of breathing air from a compressor or remote cylinder/s via an air line.</td></tr>
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3. Breathing Air Quality Requirements.

Breathing Air Quality

Breathing Air quality must meet the requirements of CSA Z180.1-00 as follows:

Component/Contaminant	Allowable Ranges or Maximum Allowable Concentrations (by volume at 21°C and 101 kPa)
Oxygen	20-22 %
Nitrogen and other inert gases	78 - 80 %
Carbon monoxide	5 ppm
Carbon dioxide	500 ppm
Methane	10 ppm
Volatile non-methane hydrocarbons	5 ppm (as methane equivalents)
Volatile halogenated hydrocarbons	5 ppm
Oil, particulate and condensates	1 mg/m^3
Water (compressed air systems at pressures of 15 to 2216 psig)	Pressure dew point must be at least 5° C below the lowest ambient temperature to which the equipment will be exposed at any time of the year.
Water (compressed air systems at pressures at or above 2216 psig)	Pressure dew point must be at least 5° C below the lowest ambient temperature to which the equipment will be exposed at any time of the year, and Atmospheric dew point must not be above -53° C*.
Odors	No pronounced odor.

References.

Reference the following documents as required:

Document Name	Document ID
Alberta Occupational Health and Safety Code, Sections 162, 244-255	
BC Occupational Health Safety Regulation Part 8, Sections 8.32-8.45	
CSA Standard Z180.1 Compressed Breathing Air and Systems	
CSA Standard Z94.4-02 “Selection, Use and Care of Respirators”.	
Breathing Air Quality Requirements of “Compressed Breathing Air Systems”	