

High-risk management standard

CONFINED SPACES

Updated
on
2022

Confined spaces have usually limited or restricted means for entry or exit and they are not designed for continuous occupancy; by virtue of its enclosed nature, it creates conditions that give rise to a likelihood of an accident, harm or injury of such a nature as to require emergency actions.

Confined spaces often have poor ventilation which allows hazardous atmospheres to quickly develop, especially if the space is small.

The hazards are not always obvious and may vary in time for the same confined space.

This standard is intended to ensure that all measures are taken to prevent and control the risk of exposure to the identified hazards.

SCOPE:

This document applies to all activities and sites of Veolia.



*Global Occupational
Health & Safety*



LIFE SAVING RULES

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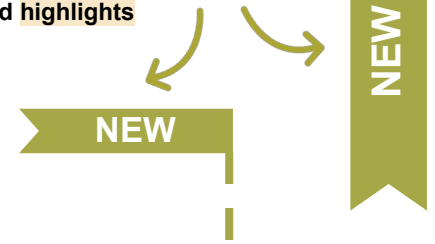


CONFINED SPACES

I test the atmosphere and always have an attendant outside before entering & while working in a confined space.

New information

is easy to find with markers and highlights



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1.0 > Definitions

A confined space is a place which is substantially enclosed (though not always entirely) and where serious injury can occur from hazardous substances or conditions within the space or nearby.

A confined space means an enclosed or partially enclosed space that:

- is not primarily designed or intended to be occupied by a person.
- is designed or intended to be at normal atmospheric pressure while any person is in the space.
- or is likely to be a risk to health and safety because of:
 - an atmosphere that does not have a safe oxygen level (i.e. oxygen level between 19.5% and 23.5%);
 - contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion, or because of their toxic concentrations;
 - or nature of the intervention
 - or an engulfment.

NEW

The risks of working in a confined space include:

- Loss of consciousness, injury or death due to the immediate effects of airborne contaminants.
- Fire or explosion from the ignition of flammable contaminants.
- Difficulty in rescuing and treating an injured or unconscious person.
- Asphyxiation resulting from oxygen deficiency or immersion in a free-flowing material, such as ashes, sand, water or other liquids.
- Chronic exposure to toxic or carcinogenic, mutagenic or reprotoxic (CMR) chemicals.

Confined spaces are commonly found in (and not limited to): storage tanks, wet or dry wells, pipes, ducts, chimneys, silos, containers, pressure vessels, underground sewers, sewage pumping stations, chlorination and ozonation stations, trenches when it is difficult to enter or to leave, tunnels or other closed or partially closed structures, sludge storage areas, inside boilers and furnaces, air treatment plants, waste pits, false ceilings, air ducts, crawl spaces, distillation columns, etc.



A confined space means an enclosed or partially enclosed space large enough and configured for a person to enter.

Examples of confined spaces



2.0 > Main hazards in confined spaces

The risk assessment must assist in defining the preventive control measures that should be implemented by:

- Identifying those potentially exposed.
- Identifying the sources of risk and affected processes.
- Identifying the control measures that should be implemented.
- Following up on the effectiveness of the control measures implemented.

2.0.1 – Limited or restricted means for entry or exit

Narrow entrances and exits make it difficult to rescue injured workers or to get equipment in or out of the confined space. In some cases, entrances and exits may be very large but their location can make them difficult to access. For example, accessing pits or openings high up in silos may require the use of ladders, hoists or other devices, and escape and rescue from such spaces may be difficult in case of emergency.

2.0.2 – Airborne contaminants

> Source	> Examples (not exhaustive)
Chemicals cumulated or produced inside a confined space.	<ul style="list-style-type: none"> • <u>Hydrogen sulphide</u> accumulation (sewers and pits). • Release of toxic substances such as hydrogen sulphide produced naturally from decaying organic matter, e.g., in sewage sludge tanks.
Works performed in the confined space.	<ul style="list-style-type: none"> • Use of paints, adhesives, solvents or cleaning solutions producing toxic <u>gases and vapours</u>. • Welding or brazing. • <u>Exhaust fumes</u> from engines in the neighbourhood. • Use of inert gas during technical operations (under nitrogen for catalyst handling).
Entry of natural contaminants, e.g., groundwater and gases, into the confined space from the surrounding land, soil or strata.	<ul style="list-style-type: none"> • Acid groundwater acting on limestone with the potential to produce dangerous accumulations of <u>carbon dioxide</u>. • <u>Methane</u> released from groundwater and from decay of organic matter. • <u>Radon</u>.
Release of airborne contaminants.	<ul style="list-style-type: none"> • When sludge, slurry or other deposits are disturbed or when scale is removed.
Manufacturing process.	<ul style="list-style-type: none"> • Residues left in tanks, vessels etc., or remaining on internal surfaces can evaporate into a gas or vapour.
Entry and accumulation of gases and liquids from adjacent plants, installations, services or processes.	<ul style="list-style-type: none"> • The contamination of underground confined spaces by substances from factories in the vicinity of the confined space. • <u>Carbon monoxide</u> from the exhaust of LPG-powered forklifts operating into or in the vicinity of the confined space.

2.0.3 – Hazardous level of oxygen

The atmospheric concentration of oxygen is 21% (v/v), although oxygen levels of 19.5% to 23.5% by volume are considered to be safe.

Some situations can cause the level of oxygen to dramatically decrease, leading to an oxygen-deficient atmosphere and possible asphyxiation.

This may occur, for example, if oxygen in the atmosphere is:

- displaced by gases produced during biological processes, for example, methane in a sewer.
- displaced during purging of a confined space with an inert gas to remove flammable or toxic fumes.
- depleted inside metal tanks and vessels through surface oxidation (for example, when rust forms).
- consumed during combustion of flammable substances.
- absorbed or reacts with grains, wood chips, soil or chemicals in sealed silos.

Too much oxygen can increase the risk of fire or explosion. Oxygen-enriched atmospheres may occur if:

- chemical reactions cause the production of oxygen, for example certain reactions with hydrogen peroxide.
- there is a leak of oxygen from an oxygen tank or fitting while using oxy-acetylene equipment.



A confined space register indicates at least for each space: its location, the hazards present or likely to be present.

NEW

2.0.4 – Fire and explosion

A fire or explosion requires the minimum presence of three elements:

- activation energy (chemical, electrical, mechanical, nuclear, thermal or chain reaction).
- oxidizing (oxygen, ozone, hydrogen peroxide...).
- fuel (gas, steam, solid).

An explosive atmosphere consists of a contained mixture of flammable substances with air in the form of gas, vapour or mist in such proportions that it can be exploded by excessive temperatures, arcs or sparks. The gases, vapours or mists will only explode when mixed with air between specific percentage mixtures, called: Lower Explosive Limit (LEL) and Upper Explosive Limit (UEL).

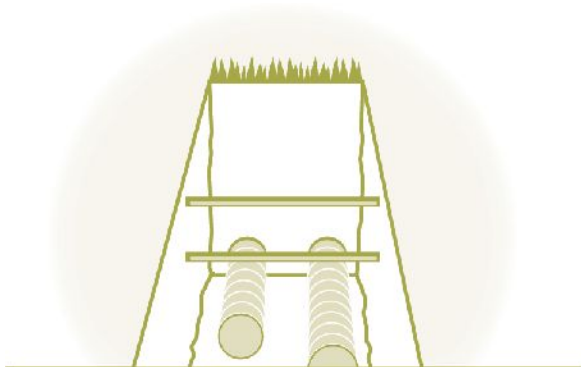
Flammable and explosive atmospheres in confined spaces may result from the evaporation of flammable residues or flammable materials used in the space, a chemical reaction (such as the formation of methane in sewers), or from the presence of combustible dust (as in the activated carbon powder silos).

Containment and flammable atmosphere can lead to an explosion in minimum if all the conditions of the fire triangle are met simultaneously.

2.0.5 – Engulfment

Engulfment means to be swallowed up in or be immersed by material, which may result in asphyxiation.

Examples of materials that may pose a risk of engulfment include sand, liquids, fertilizer, grain, coal, coal products, ashes and sewage.



Sand, grains and ashes are materials that may cause an engulfment.



2.0.6 – Other hazards

- **Uncontrolled introduction of liquids** (climatic events: storms, flooding, sea level rise), solids or gases that can result in drowning, poisoning vapours and gases.
- **Biological hazards** such as viruses, bacteria may result in infectious diseases, dermatitis or lung conditions such as hypersensitivity pneumonitis (HP; also called allergic alveolitis or extrinsic allergic alveolitis, EAA).
- **Electrical hazards** can arise from cables, transformers, capacitors, relays or any exposed terminals and wet surfaces.
- **Mechanical hazards** may cause significant physical damage such as lacerations, crushing, and amputations. Sources of mechanical hazards include agitators, mixers, moving parts and various tools such as drills and concrete saws.
- **Hazardous substances** may increase likelihood of skin contact with surfaces contaminants.
- **Noise** can cause hearing loss and other health effects such as stress or loss of balance. It can also prevent the workers to hear the alarm signals in case of emergency.
- **Manual tasks** can be a source of physical constraints related with working in a confined space.
- **More environmental hazards** can cause injury or damage and include:
 - heat or cold stress arising from the work, process or conditions.
 - slips, trips and falls arising from slippery surfaces or obstacles.
 - inadequate lighting.
- **Hazards outside the confined space** in case of a vertical opening.

Traffic hazards are a concern where confined space entrances or exits are located on footpaths or roads. There is the potential for workers entering or exiting the space to be struck and injured by vehicle traffic.

Work done in the vicinity of the confined space can contaminate the atmosphere inside the confined space. A common example is the exhaust gases from an internal combustion engine. There may also be potential for fire or explosion where hot work is done in areas next to confined spaces that contain flammable atmospheres.

- **Additional physiological and psychological demands**

Consideration should be given to a worker's:

- physical ability.
- ability to work in a restrictive space (for example claustrophobia).
- ability to wear the personal protective equipment required to do the work (e.g., breath apparatus).

3.0 > Confined spaces identification process

3.0.1 - Confined Space Identification

1. The space is enclosed or partially enclosed



2. The space is non designed, non intended for permanent human occupation

Spaces non designed or non intended for permanent human occupation are spaces with poor ventilation* and/or inadequate lighting and/or restricted means of entry or exit. For instance the size of the opening makes it difficult to get in and out of and difficult to remove a person from the space.



3. The space is likely to pose a risk to health and safety from at least one of the following:

- the atmosphere does not have oxygen content in air of between 19.5% – 23.5%.
- presence of contaminants, for example airborne gases, vapours and dusts that may cause injury from fire or explosion.
- chemical or biological air contaminants (in case of a concentration exceeding the exposure thresholds or they are likely to cause impairment of health, loss of consciousness or asphyxiation).
- an engulfment.
- any accumulation of solids including fly ash, grains, sawdust and sand that can flow and form a temporary cavity or bridge, which may collapse and surround a person, cutting off their air supply.

YES



Confined space

NO



4. The nature of the activities carried out within the confined space is likely to generate a health and safety risk (welding, painting, etc.)

YES



Confined space

NO



No Confined Space

* A poor ventilation means insufficient air renewal to maintain pollutant concentrations, oxygen levels or explosive limits within regulatory limits.

3.0.2 - Confined Space Register

NEW

Once the confined spaces identification process in the perimeter has been completed, a confined space register should be created and kept up to date. It should indicate at least for each space:

- its location,
- the hazards present,
- and/or likely to be present.

This register does not include all spaces that may become a confined space due to the nature of the activity being carried out. For example, a trench may meet the definition of a confined space if hot work is being carried out.





4.0 > Risk management – Hierarchy of control

Control measures must be ranked from the highest level of protection and reliability to the lowest.

This method of logical reasoning is a system used to eliminate or minimise exposure to risk.

It is known as RISK MANAGEMENT HIERARCHY.

You must always aim to **eliminate a hazard** which is the most effective control. If it is not practicable, the risk must be minimized by one or a combination of the following:

HIGHEST	ELIMINATION	Can the confined space entry be totally eliminated? Can the work be done another way?	MOST
Health & Safety Protection  	SUBSTITUTION	Can the confined space entry be replaced for a less hazardous method, material or system?	Reliability of control measures  
	ENGINEERING	Can a mechanical system be used to keep workers remote from the confined space?	
	ISOLATION	Can barriers be put in place to remove people from the hazards? Collective protective equipment? Can we reduce the frequency of intervention?	
	ADMINISTRATIVE CONTROLS	Can training, increased supervision, procedures, rotation and signage minimize exposure?	
LOWEST	PERSONAL PROTECTIVE EQUIPMENT	Can PPE protect the workers from the hazard or risk?	LEAST

5.0 > Requirements

Application

This high risk management standard applies to all interventions/activities related to confined Spaces, exception made when stricter requirements must be complied (such as national regulations, international standards, clients requirements, codes of practices...).

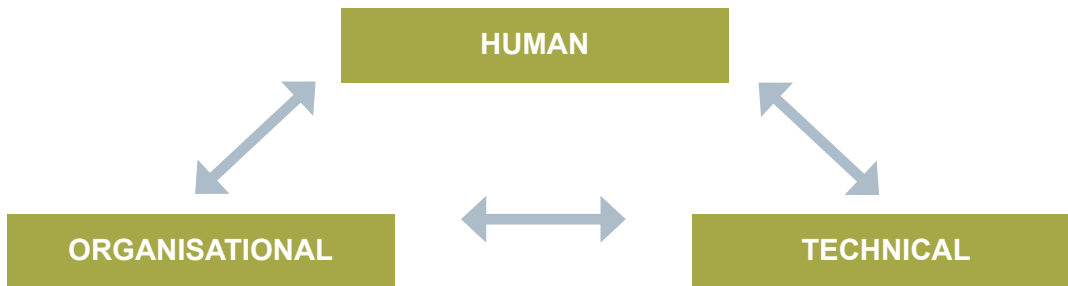
This standard applies to all Veolia entities and to all acting under their responsibility, such as managers, employees, contractors, suppliers, visitors or any other person acting in the name of a Veolia entity.

NEW

Preliminary requirements

Use of the word “**must**” within this standard means a requirement is mandatory.

Use of the word “**should**” within this standard means the primary intent is that the requirement is mandatory but specific circumstances may mean implementation of the requirement is not reasonably practicable.



I test the atmosphere and always have an attendant outside before entering & while working in a confined space.
(Life Saving Rules)

NEW

5.0.1 – Human requirements


1. **The Life-Saving Rule relating to this standard must be rolled out to all employees and contractors.**
2. **Suitably qualified, certified and competent** person/s must be involved in planning, supervising processes and confined space entry requirements.
3. **Workforce must be physically fit** to carry out work in confined spaces.
4. The **roles and responsibilities** of the supervisor and those working in confined spaces must be clearly defined.
5. All persons involved in work in confined spaces (procurement, sales, design & engineering, operators, managers, contractors, etc.) must follow the module of this standard in e-learning or face-to-face. The e-learning must be refreshed every 3 years.
6. All authorised workers, including those supervising the operations in confined spaces and the attendant, must receive specific training relevant to their duties as entry supervisor, attendant or authorized entrant. **The requirement also applies to workers from permanent or regular contractors that are involved in confined spaces operations. Training must be recorded, maintained and periodically renewed every 5 years or whenever there is a change in the procedure.**
7. **Appropriate training in the correct use, storage and maintenance of collective protection equipment (CPE) and personal protective equipment (PPE)** must be provided to all managers, employees and contractors.
8. **Workforce involved in confined spaces entry must be able to clearly communicate in a common code**, understandable and unambiguous and if necessary using means of communication planned in advance (e.g. via a lifeline, horn, talkie,...).
9. In order to ensure that this standard is properly applied to all interventions in confined spaces observations (such as safety visits, audits, etc.) must be carried out regularly.
10. Observation (such as safety visits, audits, etc.) carried out during the intervention must take into account the behaviour of those observed.
11. Observations must lead to:
 - the activity being stopped until compliance is restored in case of deviations from critical requirements of this standard;
 - immediate remediation and/or corrective action plan in case of deviations from requirements of this standard others than critical;
 - recognition of existing good-practices through sharing and "copy & adapt".

5.0.2 – Organisational requirements

1. Purchase, design, installation and assembly of equipment (including hired and contracted equipment) must meet the requirements of this standard.

5.0.2.1 – Before the start of any work in confined spaces

1. A systematic job safety analysis (JSA) must be carried out by the team executing the work (employees of Veolia and/or contractors) prior to starting the job. It must include the review of the existing procedures to be applied.
2. A local documented Confined Spaces Entry Procedure including mandatory requirements must be developed and implemented in accordance with the requirements of this standard.
3. A management of change procedure must be in place for changes of processes, equipment or safety devices with impact on the confined space safety. **Technical and/or organisational changes to a confined space must be subjected to a review of the existing risk assessment.**
4. A risk analysis of interventions in confined spaces must be carried out using collective and individual protective equipment. It must identify atmospheric pollutants and physical hazards.
5. On the basis of the risk analysis, a confined spaces register must be established and maintained at locations readily accessible to persons who may be exposed to confined spaces. It must indicate, **as a minimum, for each confined space, its location and the hazards present or likely to be present.**
6. Any intervention in a confined space must be subject to a prior entry permit (refer to the appendix Example of a Confined Space work permit).
7. Depending on the risk assessment, workforce must at the opening of the confined space:
 - have respiratory protective equipment to protect against air pollutants.
 - permanently wear a personal gas detection device.
 - be provided with the required personal protective equipment.
8. In the absence of effective natural or mechanical ventilations on the work, the installation of an appropriate forced ventilation system (flow rate vs. volume of the confined space) should allow the work to be carried out throughout the duration of the intervention without the need for an insulating breathing apparatus. (refer to appendix Ventilation sizing diagram).
9. Testing a confined space for atmospheric hazards must be done before entering and using direct reading instruments that must have a valid calibration according to the frequency indicated by the manufacturer. Equipment must be tested before each use.
10. A check of the lock-out of the potential sources of hazardous energy sources and fluids that should be isolated must be carried out.

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11. **Each operation must be, as a minimum, directed by a trained and qualified entry supervisor who must ensure that elimination and/or control measures are taken.** The entry supervisor must:
 - review the entry permit and ensure risks have been eliminated and/or control measures have been implemented.
 - control collective and individual protective equipment.
 - carry out an atmosphere test; prepare a measurement plan for interventions.
 - determine whether acceptable entry conditions exist, authorize the entry, oversee entry operations, verify that conditions are maintained, terminate the entry, and cancel the entry permit.
 - have emergency numbers and a means of communication.
 - remove unauthorized persons.
 - ensure the supervision of the teams (entry/exit, metrology, etc.).
 12. **A written emergency plan must be established, validated and communicated to all involved before any intervention.**
 13. **Potential accident scenarios must be identified and emergency measures must be defined and ready to be deployed. On industrial sites, this plan must be developed with the client.**
 14. **Emergency plans should be tested regularly (by sampling).**

NEW

5.0.2.2 – During the work in the confined space

1. **A trained and qualified permit-required confined attendant must be present during entry** and at all times whenever there is someone working within the confined space. They must be in permanent communication with the entrant(s) in the confined space (e.g., by radio or by use of a lifeline, a klaxon...). The communication signals must have been explained and understood by all before entry. The attendant is the guarantor of the entrants (list of entrances and exits).
2. **The attendant must not enter the confined space** at any time, even in an emergency.
3. **Work in confined spaces must be covered by a written Entry permit:**
 - Before authorising the entry, the entry supervisor must complete the “Confined Space Supervisor Pre-Entry Checklist”. All entrances in a confined space must be individually authorised.
 - The completed checklist and the entry permit must be available to the attendant before entrance authorization and at all time of work.
 - Entrant(s) must be familiar with acceptable entry conditions including atmospheric monitoring before signing the permit and enter in the confined space.
 - Entrant(s) must promptly evacuate the confined space if:
 - the atmospheric monitoring alarm sounds;
 - breath apparatus fail;
 - forced air ventilation stops;
 - the attendant tells them to leave;
 - the attendant informs them of problems such as alarms sounding or lighting in the vicinity;
 - in case of any breakthrough on PPE, exposure symptoms or structural changes inside the confined space.

NEW



4. Management of the conclusion of confined space entry work

- Upon work completion, the entrant(s) must notify the entry supervisor, must retrieve tools and equipment and must clean up the space as necessary before ending the work.
- The attendant must check that no one remains in the confined space and all measures required to bring the confined space back to normal service have been performed.
- The confined space entry permit is cancelled by signing the “End Entry” section of the permit. The entry permit must be archived for at least one year.
- Entry supervisor must terminate the entry upon work completion and must ensure the confined space has returned to its proper conditions.
- Where applicable, reversing lock-out or other safety procedures must be performed in coordination with customer or facility before removing locks.

5. Contractor program requirements

When works in permit-required confined spaces are performed by a contractor, the host employer must:

- inform the contractor that the workplace contains permit spaces and that permit entry is mandatory.
- inform the contractor of the identified hazards and the known experience with the confined space.
- inform the contractor of the procedures and preventive measures implemented in or near those particular confined spaces.
- coordinate entry operations with the contractor in case of co-activity in or near confined spaces.
- debrief with contractor at the conclusion of the works.

5.0.3 – Technical requirements

1. **All confined spaces listed in the register must be identified on entry to alert to hazards and limit access.**

Signages example:



NEW

2. **All potentially hazardous energies (hydraulic, chemical, pneumatic, mechanical...) must be isolated before any person enters a confined space. The operation area must be secured (e.g. lock-out/tag-out); the associated equipment must be clearly identified and must be indicated on a plan to prevent mistakes.**

3. **A confined space entry must be secured against unauthorized entry.**

4. **In addition to PPE defined during the risk analysis, all workers in confined spaces must have an individual multi-gas detector and a means of communication with the supervisor.**

NEW



6.0 > Glossary

Acceptable Entry Conditions: the conditions that must exist in a confined space to allow entry and to ensure that employees involved in a permit-required confined space entry can safely enter into and work inside.

Alternate Entry Procedure Confined Space: a confined space where the only hazard remaining is one that can be controlled by forced ventilation.

Authorized Attendant: an individual stationed outside one or more confined spaces who monitors and maintains communications with the authorized entrants and who performs all attendants' responsibilities.

Authorized Entrant: an employee who is authorized to enter a confined space and who performs all entrants' responsibilities.

Competent person: a person who has acquired the knowledge and skills to carry out the task through training or experience. Competency is a combination of these attributes that enables a worker to identify both the risks arising from a situation and the measures needed to deal with them.

Controlled Hazard: a hazard is "controlled" when the hazard still exists but the potential exposure to the hazard is controlled through means of collective and/or personal protective equipment.

Eliminated Hazard: a hazard is "eliminated" when the hazard is removed.

Engulfment: the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry: the action by which a person passes through an opening into a permit-required confined space. Entry includes work activities in the space and is considered to have occurred as soon as any part of the entrant's body passes through an opening into the confined space.

Entry Permit: the written or printed document that the employer provides that contains the necessary information to allow and control entry into a permit-required confined space.

Entry Supervisor: the qualified and authorized employee responsible for determining whether acceptable entry conditions are present in a confined space where entry is planned, for authorizing entry and overseeing entry operations, for terminating entry as required by this section, and performing all entry supervisors' responsibilities.

Hazardous Atmosphere: an atmosphere that may expose employees to the risk of death, incapacitation, impairment or ability to self-rescue, injury, or acute illness.

Hot Work: any work involving burning, welding, riveting, or similar fire-producing operations, as well as work which produces a source of ignition, such as drilling, abrasive blasting, and space heating.

Isolation: a process whereby the confined space is removed from service and completely protected against the inadvertent release of material and hazardous energy.



Oxygen Deficiency: refers to an atmosphere containing less than 19.5% oxygen.

Oxygen Enriched: an atmosphere containing an oxygen concentration greater than 23.5%.

Qualified person: one who is BOTH competent AND in possession of a recognized degree, certificate, or professional standing.

Rescue Service: the personnel designated to rescue employees from confined spaces.

Reinforced ventilation: continuous supply of fresh air into the confined space by mechanical means to maintain acceptable atmospheric levels.

NEW

Ventilation: insufflation of air into a confined space to limit the concentration of pollutants and maintain an acceptable oxygen level for humans. It can be of 2 types: natural, through openings inside the confined space, or mechanical, through permanent ventilation systems.

APPENDIX 1 > Example of a Confined Space Work Permit

	Confined Space Work Permit For any entry into a confined space previously identified	
Document track : Exploitation --> QHSE Dpt --> Exploitation		Number :
<p>Reminder : A Confined Space Work Permit must be issued for any entry into a confined space. A confined space is a space or structure large enough for a person to physically enter and carry out work. It has limited entry/exit openings and natural ventilation. It is not designed for continuous use and must have normal atmospheric pressure when a person is inside. It is likely to be a health and safety hazard.</p>		

Start date of work		End date of work	Maximum duration : 1 day
Site of works		Reference (if relevant)	
Work zone <small>(In which specific area will the intervention will take place)</small>		Name of the installation	
Type of work			
- List of authorised works	-		
- LOTO: fluid, elec, mechanic,...	-		
- Repair, maintenance, test,...	-		

Works supervisor:	Worker(s):	Attendant:
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Specific Risk Analysis (including physical danger) - To be filled in by works supervisor & QHSE officer

Risks	<input type="checkbox"/> Risk of explosion (presence of flammable vapours/substances) Presence of products: <input type="checkbox"/> Solids <input type="checkbox"/> Liquids <input type="checkbox"/> Restart of mechanical equipments <input type="checkbox"/> Incoming products <input type="checkbox"/> Fall from height <input type="checkbox"/> Confined conductive enclosure <input type="checkbox"/> Hot works <input type="checkbox"/> Co-activity <input type="checkbox"/> Other risks (asphyxiation, anoxia, toxic atmosphere,...) <input type="checkbox"/> Other risks (noise, dangerous access, particle projection)	Preventive measures	<input type="checkbox"/> ATEX equipment (Use of non-sparking tools) <input type="checkbox"/> Fire extinguisher <input type="checkbox"/> Emptying, cleaning of the confined space prior to the intervention <input type="checkbox"/> Dusting <input type="checkbox"/> Humidification <input type="checkbox"/> Pumping <input type="checkbox"/> Securization of the installations (Lock out certification required) <input style="color: red;" type="checkbox"/> Lockout test of energy sources to be physically checked before the intervention <input type="checkbox"/> Use of verified fall arrest equipment (harnesses, lanyards, fall arrest devices, etc.) <input type="checkbox"/> Helmet with chinstrap/Securing (net) <input type="checkbox"/> Use of very low voltage lighting <input type="checkbox"/> Isolation transformer for the use of electric tools or appliances <input type="checkbox"/> Hot works permit <input style="color: red;" type="checkbox"/> Implement the fire prevention measures described in the permit <input type="checkbox"/> Identification of other company(ies) and associated risks (co-activity) <input type="checkbox"/> Other measures: <input type="checkbox"/> Individual multi-gas detector: _____ <input type="checkbox"/> Lifting device: _____ <input type="checkbox"/> Type of mask protection: _____
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APPENDIX 1 > Example of a Confined Space Work Permit

Mandatory prerequisites - To be filled in by the permit holder and the QHSE referent

<input type="checkbox"/> Control of the operating procedure for the intervention <input type="checkbox"/> Fully drained/depressurised equipment checked <input type="checkbox"/> Necessary locks out made (Work/LOTOc permit validated) <input type="checkbox"/> Up-to-date equipment (gas detector, PPEs, AIR, etc.) <input type="checkbox"/> Atmosphere check before intervention <input type="checkbox"/> Monitoring during intervention <input type="checkbox"/> Signage of open accesses, exits and site markings <input type="checkbox"/> Presence of an attendant outside for the duration of the operation (qualified, competent and trained team) <input type="checkbox"/> Mandatory visual/voice contact between the workers and the supervisor <input type="checkbox"/> Appropriate work equipment/PPE, checked and up to date <input type="checkbox"/> Evacuation instructions (Emergency plan approved and communicated) <small>(Emergency situation and rescue equipment identified and provided, including means of escape)</small> <input type="checkbox"/> Fire fighting facilities provided and available <small>(Fire extinguisher, hot work permit, if required)</small> <input type="checkbox"/> Visual inspection and risk analysis done <input type="checkbox"/> Preparing the entry register for this confined space <input type="checkbox"/> Workers in the immediate vicinity are informed	<input type="checkbox"/> Appropriate ventilation (mechanical if necessary) and lighting <input type="checkbox"/> Forced ventilation during work (extraction mode) <input type="checkbox"/> Forced ventilation during work (injection mode) <input type="checkbox"/> Opening/ventilation of the confined space before intervention (1h)																																												
Gas measurement results - Before entering																																													
Measurements done the _____ at _____ THRESHOLD																																													
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Is the operation covered by a prevention plan? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is there a need for an amendment? <input type="checkbox"/> Yes <input type="checkbox"/> No
---	--

PPE's, take advantage of this step to cross-check with your colleague:

<input type="checkbox"/> 	<input type="checkbox"/> 	<input type="checkbox"/> 	<input type="checkbox"/> 	<input type="checkbox"/> 	<input type="checkbox"/> 	<input type="checkbox"/> 	<input type="checkbox"/> 
<input type="checkbox"/> Others	<input type="checkbox"/> 	<input type="checkbox"/> 	Others (to be defined):				

Documentation: Do you have at your disposal the register of this confined space, professional card of the personnel involved, updated prevention plan? Yes No

Training: Have all the people involved (site manager, supervisor, worker(s)) received adequate training? Yes No

Did you take 5 minutes to remind everyone involved (including subcontractors) of the **procedures to be applied and the checks to be made**? Yes No

Delivery of the permit: The authorization is given by the person in charge of the works so that the works can continue subject to the specified conditions and the risk analysis carried out beforehand and in common agreement with the QHSE referent.

The signature below for the start of the work is mandatory.
Reminder: If any deficiencies are detected during the specific risk analysis or equipment/materials check, the permit should not be issued.

Work permit duration : **Start** DD/MM/YYYY: _____ at _____ h **End** DD/MM/YYYY: _____ at _____ h

APPENDIX 1 > Example of a Confined Space Work Permit

End of operation

- I hereby declare that all work for which this permit was issued has been completed,
- that all personnel have evacuated the area (responders, supervisors, etc.) and that all tools and equipment have been recovered from the confined space,
- that all necessary measures to make the confined space operational have been carried out including LOTOc before the permit is closed,
- to have communicated the end of the intervention and that all associated equipment has been left in a safe condition, and
- that the confined space is returned to its original operating condition.

Start of operation: Signatures

End of operation: Signatures

Work supervisor <i>Name, First name + Date + Signature</i> <i>Phone Number:</i>	Work supervisor <i>Name, First name + Date + Signature</i>
QHSE officer <i>Name, First name + Date + Signature</i> <i>Phone Number:</i>	QHSE officer <i>Name, First name + Date + Signature</i>

Start of operation: Signatures

End of operation: Signatures

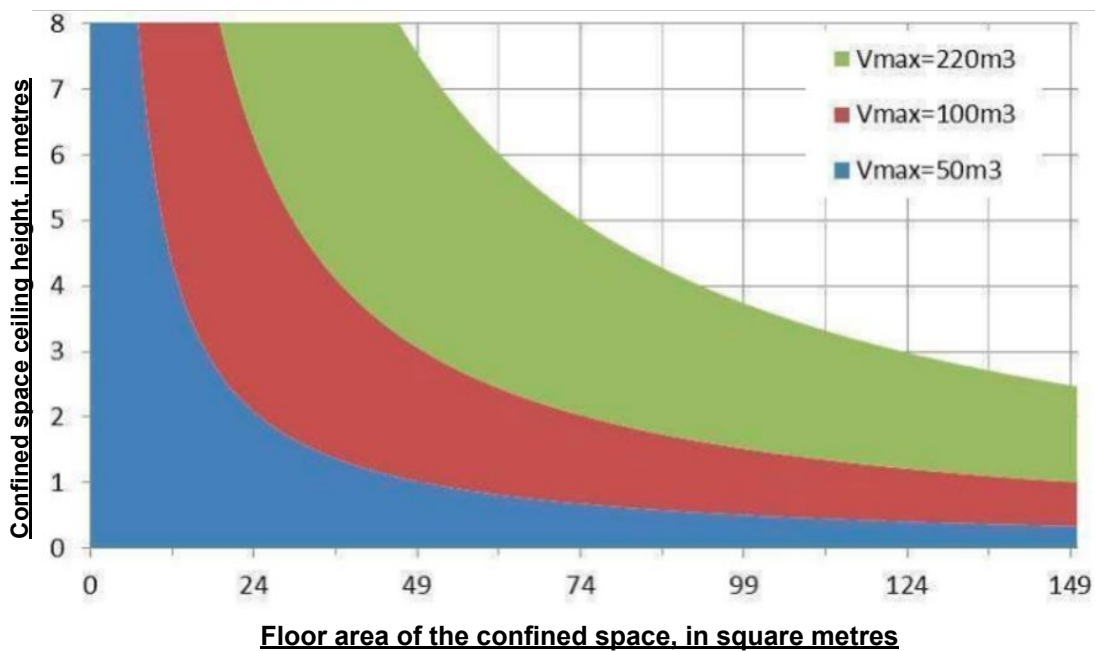
Attendant <i>Name, First name + Date + Signature</i> <i>Phone Number:</i>	Attendant <i>Name, First name + Date + Signature</i>
Worker(s) <i>Name, First name + Date + Signature</i> <i>Phone Number:</i>	Worker(s) <i>Name, First name + Date + Signature</i>
Worker(s) <i>Name, First name + Date + Signature</i> <i>Phone Number:</i>	Worker(s) <i>Name, First name + Date + Signature</i>
Worker(s) <i>Name, First name + Date + Signature</i> <i>Phone Number:</i>	Worker(s) <i>Name, First name + Date + Signature</i>

Comments on the intervention - Failure to meet requirements

PLEASE PROVIDE FEEDBACK ON THE ELEMENTS TO BE TAKEN INTO ACCOUNT FOR THE NEXT INTERVENTION

APPENDIX 2 > Ventilation sizing diagram

In order to enable workers to set up effective mechanical ventilation, they will find below a chart to help them choose the type of fan to use according to the volume of the work area:



In the blue zone, a fan of at least 1000m³/h is required.

In the red zone, a fan of at least 2000m³/h is required.

In the green zone, a fan of at least 4400m³/h is required.

For the volumes included in the white zone of the above chart, in the absence of a fan of sufficient capacity, the ventilation speed of 0.3m/s in insufflation as close as possible to the fan should be respected, according to the characteristics given by the manufacturer on the fan discharge.

APPENDIX 3 > Applicability and compliance assessment

> REQUIREMENTS	C	NC	Criticality
HUMAN			
1. The Life-Saving Rule relating to this standard must be rolled out to all employees and contractors.			1: Critical
2. Suitably qualified, certified and competent person/s must be involved in planning and supervising processes and confined space entry requirements.			1: Critical
3. Workforce must be physically fit to carry out work in confined spaces.			1: Critical
4. The roles and responsibilities of the supervisor and those working in confined spaces must be clearly defined.			1: Critical
5. All persons involved in work in confined spaces (procurement, sales, design & engineering, operators, managers, contractors, etc.) must follow the module of this standard in e-learning or face-to-face. The e-learning must be refreshed every 3 years.			2: Important
6. All authorised workers, including those supervising the operations in confined spaces and the attendant, must receive specific training relevant to their duties as entry supervisor, attendant or authorized entrant. The requirement also applies to workers from permanent or regular contractors that are involved in confined spaces operations. Training must be recorded, maintained and periodically renewed every 5 years or whenever there is a change in the procedure.			1: Critical
7. Appropriate training in the correct use, storage and maintenance of collective protection equipment (CPE) and personal protective equipment (PPE) must be provided to all managers, employees and contractors.			2: Important
8. Workforce involved in confined spaces entry must be able to clearly communicate in a common code , understandable and unambiguous and if necessary using means of communication planned in advance (e.g. via a lifeline, horn, talkie,...).			1: Critical
9. In order to ensure that this standard is properly applied to all interventions in confined spaces within the perimeter, regular safety inspections must be carried out by competent person.			2: Important
10. Observation (such as safety visits, audits, etc.) carried out during the intervention must take into account the behaviour of those observed.			2: Important
11. Observations must lead to: <ul style="list-style-type: none"> • the activity being stopped until compliance is restored in case of deviations from critical requirements of this standard; • immediate remediation and/or corrective action plan in case of deviations from requirements of this standard others than critical; • recognition of existing good-practices through sharing and "copy & adapt". 			1: Critical

C: Compliant

NC: Non compliant

P: Priority as defined

1: Critical = Requirement that is fundamental to be deployed to avoid serious incidents.

2: Important = Requirement that is essential and should be implemented to the extent possible to avoid incidents.

3: Useful = Requirement that has an effective role in strengthening prevention

APPENDIX 3 > Applicability and compliance assessment

> REQUIREMENTS	C	NC	Criticality
ORGANISATIONAL			
1. Purchase, design, installation and assembly of equipment (including hired and contracted equipment) must meet the requirements of this standard.			1: Critical
Before the start of any work in confined spaces			
1. A systematic job safety analysis (JSA) must be carried out by the team executing the work (employees of Veolia and/or contractors) prior to starting the job. It must include the review of the existing procedures to be applied.			2: Important
2. A local documented Confined Spaces Entry Procedure including mandatory requirements must be developed and implemented in accordance with the requirements of this standard.			1: Critical
3. A management of change procedure must be in place for changes of processes, equipment or safety devices with impact on the confined space safety. Technical and/or organisational changes to a confined space must be subjected to a review of the existing risk assessment.			2: Important
4. A risk analysis of interventions in confined spaces must be carried out using collective and individual protective equipment. It must identify atmospheric pollutants and physical hazards.			1: Critical
5. On the basis of the risk analysis, a confined spaces register must be established and maintained at locations readily accessible to persons who may be exposed to confined spaces. It must indicate, as a minimum, for each confined space, its location and the hazards present or likely to be present.			2: Important
6. Any intervention in a confined space must be subject to a prior entry permit (refer to the appendix Example of a Confined Space work permit).			1: Critical
7. Depending on the risk assessment, workforce must at the opening of the confined space: <ul style="list-style-type: none"> • have respiratory protective equipment to protect against air pollutants. • permanently wear a personal gas detection device. • be provided with the required personal protective equipment. 			1: Critical
8. In the absence of effective natural or mechanical ventilations on the work, the installation of an appropriate forced ventilation system (flow rate vs. volume of the confined space) should allow the work to be carried out throughout the duration of the intervention without the need for an insulating breathing apparatus. (refer to appendix Ventilation sizing diagram).			1: Critical
9. Testing a confined space for atmospheric hazards must be done before entering and using direct reading instruments that must have a valid calibration according to the frequency indicated by the manufacturer. Equipment must be tested before each use.			1: Critical
10. A check of the lock-out of the potential sources of hazardous energy sources and fluids that should be isolated must be carried out.			1: Critical

APPENDIX 3 > Applicability and compliance assessment

> REQUIREMENTS	C	NC	Criticality
ORGANISATIONAL			
<p>11. Each operation must be, as a minimum, directed by a trained and qualified entry supervisor who must ensure that elimination and/or control measures are taken. The entry supervisor must:</p> <ul style="list-style-type: none"> • review the entry permit and ensure risks have been eliminated and/or control measures have been implemented. • control collective and individual protective equipment. • carry out an atmosphere test; prepare a measurement plan for interventions. • determine whether acceptable entry conditions exist, authorize the entry, oversee entry operations, verify that conditions are maintained, terminate the entry, and cancel the entry permit. • have emergency numbers and a means of communication. • remove unauthorized persons. • ensure the supervision of the teams (entry/exit, metrology, etc.). 			1: Critical
<p>12. A written emergency plan must be established, validated and communicated to all involved before any intervention.</p>			1: Critical
<p>13. Potential accident situations must be identified and emergency measures must be defined and ready to be deployed. On industrial sites, this plan must be developed with the client.</p>			1: Critical
<p>14. Emergency plans should be tested regularly (by sampling).</p>			2: Important
During the work in the confined space			
<p>1. A trained and qualified permit-required confined attendant must be present during entry and at all times whenever there is someone working within the confined space. They must be in permanent communication with the entrant(s) in the confined space (e.g., by radio or by use of a lifeline, a klaxon...). The communication signals must have been explained and understood by all before entry. The attendant is the guarantor of the entrants (list of entrances and exits).</p>			1: Critical
<p>2. The attendant must not enter the confined space at any time, even in an emergency.</p>			1: Critical
<p>3. Work in confined spaces must be covered by a written Entry permit:</p> <ul style="list-style-type: none"> • Before authorising the entry, the entry supervisor must complete the “Confined Space Supervisor Pre-Entry Checklist”. All entrances in a confined space must be individually authorised. • The completed checklist and the entry permit must be available to the attendant before entrance authorization and at all time of work. • Entrant(s) must be familiar with acceptable entry conditions including atmospheric monitoring before signing the permit and enter in the confined space. • Entrant(s) must promptly evacuate the confined space if: <ul style="list-style-type: none"> - the atmospheric monitoring alarm sounds. - breath apparatus fail. - forced air ventilation stops. - the attendant tells them to leave. - the attendant informs them of problems such as alarms sounding or lighting in the vicinity. - in case of any breakthrough on PPE, exposure symptoms or structural changes inside the confined space. 			1: Critical

APPENDIX 3 > **Applicability and compliance assessment**

> REQUIREMENTS	C	NC	Criticality
ORGANISATIONAL			
<p>4. Management of the conclusion of confined space entry work</p> <ul style="list-style-type: none"> • Upon work completion, the entrant(s) must notify the entry supervisor, must retrieve tools and equipment and must clean up the space as necessary before ending the work. • The attendant must check that no one remains in the confined space and all measures required to bring the confined space back to normal service have been performed. • The confined space entry permit is cancelled by signing the “End Entry” section of the permit. The entry permit must be archived for at least one year. • Entry supervisor must terminate the entry upon work completion and must ensure the confined space has returned to its proper conditions. • Where applicable, reversing lock-out or other safety procedures must be performed in coordination with customer or facility before removing locks. 			1: Critical
<p>5. Contractor program requirements</p> <p>When works in permit-required confined spaces are performed by a contractor, the host employer must:</p> <ul style="list-style-type: none"> • inform the contractor that the workplace contains permit spaces and that permit entry is mandatory. • inform the contractor of the identified hazards and the known experience with the confined space. • inform the contractor of the procedures and preventive measures implemented in or near those particular confined spaces. • coordinate entry operations with the contractor in case of co-activity in or near confined spaces. • debrief with contractor at the conclusion of the works. 			1: Critical
TECHNICAL			
<p>1. All confined spaces listed in the register must be identified on entry to alert to hazards and limit access.</p>			2: Important
<p>2. All potentially hazardous energies (hydraulic, chemical, pneumatic, mechanical...) must be isolated before any person enters a confined space. The operation area must be secured (e.g. lock-out/tag-out); the associated equipment must be clearly identified and must be indicated on a plan to prevent mistakes.</p>			1: Critical
<p>3. A confined space entry must be secured against unauthorized entry.</p>			2: Important
<p>4. In addition to PPE defined during the risk analysis, all workers in confined spaces must have an individual multi-gas detector and a means of communication with the supervisor.</p>			1: Critical

