

OVERVIEW:



Various industrial maintenance and operational procedures involve working in confined space environments. The dangers that lurk in confined spaces are numerous and may be undetectable without adequate planning and proper testing equipment. For instance, conditions such as poor ventilation, which might only be a minor concern in a normal work environment, can be fatal in a confined space.

We at Liberty General Insurance Limited understand the importance of human safety against hazards and risks associated while working in confined spaces. We intend to suggest some measures to reduce these hazards and risks.

A CONFINED SPACE MAY BE DEFINED AS A SPACE WHICH:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited means of entry or exit.
- Is not designed for continuous employee occupancy.

Working in closed lid vessels, lift shafts, closed trenches, sewage pipelines, tunnels etc. can be considered as works associated with confined spaces. Entry to confined spaces can be associated with maintenance, cleaning, overhauling of machinery, reactor vessels, tanks etc.



CASE STUDIES:

WORKERS SUFFOCATED TO DEATH – BANGALORE, 2018.

An engineer and his two subordinates were allegedly suffocated to death while inspecting a chemical boiler. As per reports one of the subordinates observed a leakage and called the engineer and electrician for help. All three of them entered the boiler without permit and proper PPE (Personal Protective Equipment) and resulted in their death.



LOSS OF LIFE WHILE CLEANING SEPTIC TANK – CHENNAI, 2019

On 12th November 2019, A 25-year-old man died in Chennai at a famous mall after he entered a septic tank to rescue his brother who was cleaning tank. His brother entered the septic tank and fainted inside due to the poisonous gases. On seeing this, the victim immediately jumped to this confine space. He managed to get in and push his brother out. But by then, he was affected by the toxic fumes and died.



HAZARDS ASSOCIATED WITH CONFINED SPACES:

A subjected confined space may have following hazards associated with it:

- **Toxic Atmosphere:** A toxic atmosphere may occur or be present due to the presence or ingress of hazardous substances.
- **Oxygen Deficiency:** displacement of oxygen by another gas such as carbon monoxide can lead to suffocation.
- **Oxygen Enrichment:** higher oxygen levels can reduce LEL limits for chemicals present in confined space.

- **Flammable or Explosive Atmospheres:** can pose a risk of explosion.
- **Flowing Liquid or Free Flowing Solids:** these can result into drowning and suffocation.
- **Excessive Heat:** elevated temperatures can result in heat stroke or collapse from heat stress.





CAUSE OF CONFINED SPACE ACCIDENTS:

Accidents while working in confined spaces may occur due to:

- Lack of appropriate confined space training.
- Limited or lack of knowledge and awareness associated with conditions in confined spaces.
- Lack of Supervision.
- Lack of adherence to adequate PPE (Personal Protective Equipment).
- Lack of SOP (Standard Operating Procedures).

TYPES OF CONFINED SPACES:

There is no defined classification for types of confined spaces as such, though basis exposure levels confined spaces are generally classified as:

- Permit required confined spaces:

A space which contains or has the potential to contain a hazardous atmosphere, a material that has the potential for engulfing an entrant or could trap or asphyxiate an entrant or contains any other recognized serious safety or health hazard is considered to be a permit required confined space.

- Non-Permit required confined spaces:

A non-permit confined space has all the characteristics of a permit-required space except that when it was evaluated, it did not contain actual or potential serious health or safety hazards.

PREVENTIVE MEASURES TO AVOID ACCIDENTS:

Possibility of accidents can be reduced by taking prevention measures such as:

- Defining stringent regulations for supervisors.
- Appropriate training of all participants.
- Gas measurements before entering confined space and periodically while work is under progress.
- Use of adequate PPE like protective suits, breathing apparatuses, eye protection etc.
- Use of detection devices such as LEL (Lower Explosion Limit) detectors, Oxygen level analyzer, radiation detector before and while accessing confined spaces.
- Emergency plan to counter possible unwanted situations.
- Availability of proper and reliable communication media.
- Continuous monitoring to ensure adherence to SOP.
- Introduction and adherence to work permit system.
- Providing adequate down time for settling down suspended particles and cool down of elevated temperatures.





TRIVIA:

STATS ON CONFINED SPACE ACCIDENTS:

According to a statistic given by NIOSH (National Institute for Occupational Safety and Health) issued in 2018:

Approximately 60 percent of confined-space fatalities are rescuers, and the Occupational Safety and Health Administration reported that when multiple deaths occur during a rescue, most of the victims are "would-be" rescuers. The report suggests that:

- For 85% of the time a supervisor was present and 29% of the dead were supervisors.
- Only 31% had written Confined Space Entry Procedures and none adhered to written procedures.
- Only 15% had Confined Space training and 0% had a Rescue Plan.
- None of these spaces were Ventilated and None were tested prior to entry.



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IRDA Registration No. 150
CIN : U66000MH2010PLC209656