

# Safety of Construction Workers in Dangerous Confined Spaces

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## Abstract:

The concept of hazardous confined space is introduced in this paper by identifying the risks associated with construction sites, with a focus on hazardous gases that are frequently present there. It also discusses construction safety measures, such as air testing, ventilation and cleaning, separating enclosed spaces, personal protective equipment, entry control, blocking mobile devices, and rescuing casualties. Because confined space rescue operations present special risks, personnel must be properly trained, and specialized equipment must be available to prevent injury and death to those attempting rescue. The main cause of death was gas asphyxiation.

Keywords –construction safety, hazardous confined space.

hazards, as well as hazards from liquid or solid substances. Many conditions that create these hazards involve seemingly small changes in conditions but can instantly change these workplace conditions from harmless to life-threatening.

## 2. OXYGEN LEVEL IN CONFINED SPACES

The air we breathe contains about 21% oxygen. If the oxygen content in our breath falls below 16%, we start to feel sick.

The pulse is also measured and a buzzing sound occurs in the ears. When the oxygen level drops to a concentration of 15-10%, the man is still conscious but has false thought patterns and tires quickly. When the oxygen concentration in the air drops below 10%, a sudden feeling of fatigue, slowing of the pulse and loss of consciousness (collapse) occurs. If he is quickly taken out into fresh air and given the necessary emergency



## 1.0 INTRODUCTION :

Construction sites are rife with safety rooms and are a place where accidents often occur. The term security room is used to refer to certain structures such as tanks, containers, cisterns, sewers, etc. Any space where people work can be or become a safety space. The term actually refers to the environment where hazards can occur. Hazards include structural, process, mechanical, atmospheric, physical, chemical, biological, ergonomic

assistance, he may still be saved. When oxidized under normal conditions, B. In the open air, a person who comes into contact with such a substance is not at risk because the oxidizing substance removes oxygen from the surrounding air.

(Figure 1) or the reduced proportion of the required gas can lead to asphyxiation or leaving workers unprotected. Accident

with tragic consequences occur when nitrogen is present in closed tanks, boilers or rooms. Deaths have also been reported in hospitals and from the replacement of unmarked steel tanks in which oxygen cylinders filled with carbon dioxide were stored.

### 3. HARMFUL GASES PRESENT IN CONFINED SPACE

There are hundreds of flammable and explosive gases in the chemical industry. All these gases and vapors, when mixed with air, have a wide range of flammability and explosiveness. Within a range between the so-called lower and upper limits. These values are experimentally determined in a laboratory and expressed as a percentage. Of all toxic gases, the one that caused the most casualties was carbon dioxide, which is life-threatening even in low concentrations. It is an insidious gas, since it has no taste or smell.

Scale for mixing with air, i.e. in the range between the so-called lower and upper limits. These values are determined experimentally in the laboratory and expressed as a percentage. Of all toxic gases, the one that caused the most victims is carbon dioxide, which is life-threatening even in low concentrations. It is an insidious gas, since it has no taste or smell. Therefore, if the air contains a small content of it, it accumulates in the lungs. Other gases from this toxic gas group, some chemical such as hydrogen sulfide, have an odor that, unfortunately, quickly becomes tiresome, which increases the risk. The third group of gases - toxic gases - is characterized mainly by the air in closed rooms. The amount of oxygen necessary for human health and life is reduced. Carbon dioxide and other inert gases have already been mentioned. It happens that after extinguishing a fire in a small enclosed space filled with carbon dioxide, workers suffocate or become defenseless due to the lack of oxygen or a decrease in the proportion of the necessary gas. Accidents with disastrous consequences occur in closed tanks, boilers and in the presence of nitrogen in rooms. Deaths have also been reported in hospitals and after the replacement of unmarked steel tanks in which oxygen cylinders filled with carbon dioxide were stored.

### 4.0 OCCUPATIONAL SAFETY IN CONFINED SPACE

The indoor air of confined spaces must be measured and tested for explosiveness, toxicity and oxygen content before entering the area and while the worker is in the confined space. Working conditions must first be checked by a worksafety professional. If there is a danger to workers in a confined space, the space must be cleaned and ventilated before the workers enter. Many steps must be taken because a worker may enter a dangerous confined space. The indoor air of confined spaces must be measured and tested for explosiveness, toxicity and oxygen content before entering the area and while the worker is in the confined space. This system works best with permits where the hazardous conditions are known based on previous experience and the control measures have been tested and proven to be effective. The permits system allows for an efficient allocation of skilled manpower. Limit approvals are applied in places where a hazard has not yet been identified. If no qualified personnel are present, this hazard may go unnoticed. Mobile tanks and similar equipment of any type can be a source of hazard in different ways. For example, they can be brought into the city in a dormant state while one or more workers are on-site, or they can be a source of hazard due to various repairs that require the use of electricity.

Slipping on the supply air hose improves ventilation and seals the vulnerable area. Alert workers must not enter the dangerous area without appropriate personal protective equipment. If this is not available, they must monitor the worker from the door. After the rescue personnel enter the building, other personnel outside the building must urgently prepare all resources to rescue the injured person and administer first aid. The worker-supervisor must constantly monitor the employee-rescuer through the supply air hose and be nearby and give the agreed signal if the employee-rescuer loses sight. If the injured worker loses consciousness, mouth-to-mouth resuscitation or the use of an artificial respirator must be performed immediately. If an artificial respirator is available, it is not necessary for a doctor to be always nearby in such cases.

### 5. CONCLUSION

An essential duty of the work organization is to train the workers to be aware of the hazards they may be exposed to in dangerous confined spaces and to maintain work discipline. Many workers lost their lives due to a failure to follow basic in

structions. They randomly entered dangerous confined spaces without informing their superiors or colleagues. There were cases where dead workers were not found for hours. So sometimes it took days for the bodies to be discovered if there are records about the workers were incorrect. General safety regulations cannot logically cover all the possible cases that may occur in different types of work in different confined spaces in different industries.

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