



Maritime &
Coastguard
Agency

Enclosed Spaces

Guidance for merchant
vessel operators



Images: Holyhead Towing Company

Enclosed spaces are dangerous

If you see someone in an enclosed space: do not attempt to enter. Sound the general alarm, and take action to prepare for an organised entry.



Images: Holyhead Towing Company

“Over 50%* of workers who die in enclosed spaces are attempting to rescue other workers.”

***Credit: Confined Space Safe Practice**
- International Association of Classification Societies.

This leaflet provides tips and advice on how to identify an enclosed space, the risks of entry, and information on how to reduce the risk to life.

More detailed information can be found in the *Code of Safe Working Practices for Merchant Seafarers* (COSWP).

No one should enter an enclosed space without following proper precautions, even in an emergency.

What is an enclosed space?


Enclosed spaces are not always obvious but can be deadly.

An enclosed space is a space which is not designed for continuous worker occupancy and has either or both of the following characteristics:

- a. Limited openings for entry and exit.
- b. Inadequate ventilation.

These are just a few examples of enclosed spaces:

- Cargo holds
- Pipe tunnels
- Ballast tanks
- Pump rooms
- Peak tanks
- Void spaces
- Bunker tanks
- Cofferdams
- Fresh water tanks
- Chain lockers
- Battery lockers
- Bottom tanks
- Paint / chemical lockers
- Boiler furnaces
- Engine crankcases.



**ENCLOSED SPACE
NO ENTRY**

Some spaces such as paint and chemical lockers, CO₂ rooms, and battery lockers can be entered through weathertight or shipboard doors – but these spaces should still be considered dangerous.

Spaces connected to an enclosed space should also be treated with caution, even when there is a closed door in between. The connected space should be tested separately, as sometimes it can be dangerous even after the first space is emptied.

Even if a space appears to be safe, toxic gases or poorly oxygenated atmosphere can be trapped in pockets, even if the space has been ventilated and tested. Gas and liquid migration can occur through small gaps and cracks from connected unsafe spaces.

“A single inhalation with a 5% oxygen content may result in instantaneous loss of consciousness and subsequent death.”**

**Taken from *A Masters Guide to Enclosed Space Entry by the Standard Club.*

Images: Holyhead Towing Company

Enclosed spaces can change

Special attention is needed when dealing with cargo, as some cargo can create hazardous vapours.

Changing conditions within an enclosed space such as water ingress, oxygen-depleting work such as burning or welding, ventilation failure and vapours from paint or cleaning materials must be monitored. Conditions can also change due to external factors including the inadvertent actions of other ship or shore staff, work in adjacent or connected spaces, cargo, work pumping ballast, fuel transfer and hot work

Enclosed spaces can be deadly

Even small quantities of harmful gases can kill. An enclosed space may not contain enough oxygen to breathe properly or there could be a build-up of dangerous gases which can cause asphyxiation. This could result in serious injury, brain damage and death.

Oxygen deficiency can be caused by:

- Corrosion (rusting)
- Organic matter
- Paint drying

Hazardous gases can come from many sources, such as leaks and hazardous cargo.

“As well as a hazardous atmosphere, enclosed spaces can have additional hazards, such as poor lighting, trip and fall hazards, and the risk of drowning or suffocation from falling or loose material.”***

***Taken from *A Masters Guide to Enclosed Space Entry* by the Standard Club





**Danger of
suffocation**

The risk is serious

When incidents do occur, they can be fatal and involve more than one person. Often a second person comes to rescue the first person and becomes unconscious themselves.

Do not enter a space if you don't know if it is dangerous or not – enclosed spaces and dangerous atmospheres are an invisible killer.

Real life examples:

Example 1:

An engineer working on board a trawler was found collapsed inside a refrigerated saltwater tank. When he was found, three of his crewmates went into the tank to help him; they all suffered breathing difficulties and one also collapsed. Although the engineer was rescued from the tank, he could not be resuscitated. Two other crew members then donned breathing apparatus and rescued their struggling crewmates.

Example 2:

Three seafarers on board a vessel lost their lives as a consequence of entering an enclosed space. One entered the chain locker to secure a rattling anchor chain and collapsed. Another seafarer entered the chain locker in an attempt to help, but he also collapsed. A third tried to help the first two, but all three died due to the oxygen deficient atmosphere within the confined space.

How to reduce risk

1.

Identify your enclosed spaces

- ✓ Identify the hazard of any contents of the space.
- ✓ Ensure the spaces have hazardous warning signage and permit only access.
- ✓ All enclosed space access doors, hatches or manholes should be secured.
- ✓ Avoid entering closed spaces if possible.

2.

Carry out risk assessments and familiarise yourself with guidance

Familiarise yourself with the advice provided in the *Code of Safe Working Practices for Merchant Seafarers (COSWP)*. This is the simplest way to establish company procedure for entry into enclosed spaces. In addition, you must carry out a risk assessment and issue a permit to work.

3.

Precautions to take when entering an enclosed space

No enclosed space should be entered without proper precautions.

Before entry:

- ✓ A competent person should undertake a risk assessment and identify any potential hazards.
- ✓ Prepare the space.
- ✓ Secure the space for entry.
- ✓ Ensure persons undertaking the work are trained and have participated in appropriate drills.
- ✓ Test the atmosphere of the space.
- ✓ Complete a permit to work.
- ✓ Make a contingency plan in case things go wrong.
- ✓ Review risk assessment.

On entry:

- ✗ Never work alone.
- ✓ Ensure you have a person assigned on standby for each entry.
- ✓ The standby person should be equipped with rescue equipment including self-contained breathing apparatus and radio.
- ✓ Wear protective clothing and boots.
- ✓ The standby person should ensure they maintain radio contact with the Bridge or Engine Control room, or in port with someone who can help in case of emergency.
- ✓ Ensure the space is well ventilated. Ventilation should continue during the period that the space is occupied and during temporary breaks.

If things go wrong

- ✘ If you see someone lying motionless **do not** rush to carry out a rescue by yourself. An unplanned rescue is likely to end in tragedy as personnel rush into lethal atmospheres under the misconception that they will be able to save colleagues.
- ✓ **Stop, think** – why are they unconscious, could this be an enclosed space?
- ✓ Should an emergency occur, the general (or crew) alarm should be sounded so that back-up is immediately available to the rescue team.
- ✘ **Never** enter the space before help has arrived and a plan for rescue confirmed.

Rescue

- ✘ **Do not** enter the space without the authorisation of the master or a nominated responsible person
- ✘ **Do not** enter the space without testing the atmosphere.
- ✓ Rescue equipment including breathing apparatus should be immediately available.
- ✘ If the atmosphere is unsafe, do not enter unless it is an emergency. If it is an emergency, you must wear breathing apparatus.
- ✘ Emergency escape breathing devices (EEBDs) are **not** safe to use in enclosed space entries including for rescue.
- ✓ Self-contained breathing apparatus should be used for rescue.
- ✓ Rescue procedures should be established before entry – the rescue procedure should be specific for each type of enclosed space.
- ✓ Drills on enclosed space entry must include rescue procedures. They should be practiced frequently enough to provide a level of proficiency that eliminates life-threatening rescue attempts and ensures an efficient and calm response to any emergency.



Maritime & Coastguard Agency

Failure to follow this advice may result in multiple fatalities.

Regulations and guidance

- Merchant Shipping and Fishing Vessels (Entry into Enclosed Spaces) Regulations 2022.
- The ISM Code requires all known risks on board ships to be identified and taken account of. Enclosed spaces are known risks.****
- The company Safety Management System should ensure that a risk assessment is conducted to identify all enclosed spaces on board ship. This assessment should be periodically revisited to ensure its continued validity.

****Taken from *A Masters Guide to Enclosed Space Entry by the Standard Club*

Further Reading

- A Masters Guide to Enclosed Space Entry by the Standard Club available from <https://www.standard-club.com>
- Code of Safe Working Practices for Merchant Seafarers (COSWP) available at www.gov.uk
- Please see our website for more guidance and further reading – <https://www.gov.uk/government/publications/enclosed-spaces-on-sea-going-vessels>

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