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Enclosed spaces: protect yourself first

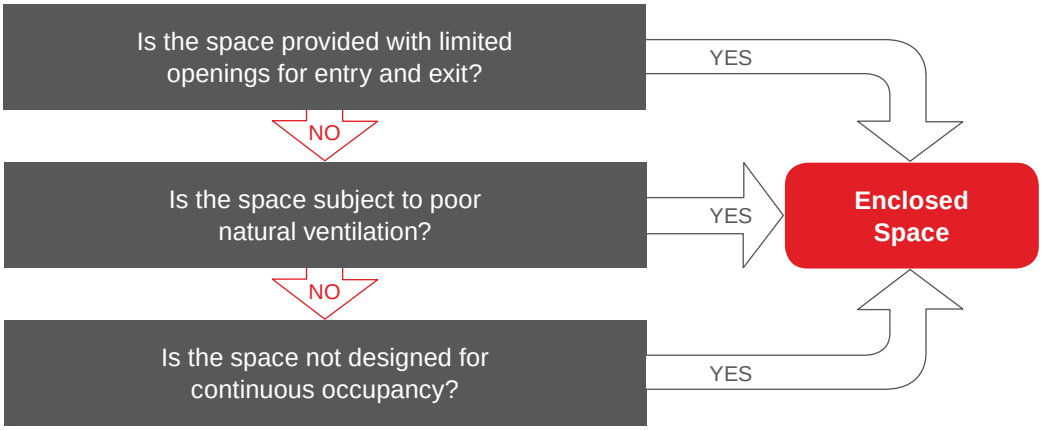
MS Amlin

The challenge of safely entering enclosed spaces is a topic which has tragically been with the industry for many decades as numerous seafarers, surveyors and stevedores have lost their lives in enclosed spaces on ships and offshore units. Many of these fatalities could have been avoided if the correct procedures had been in place and followed. As the title points out, it is of utmost importance that persons entering an enclosed space protect themselves; even more so when they assist others in need.

With this circular, MS Amlin promotes further awareness of the dangers and risks associated with the entry of enclosed spaces by providing information and practical recommendations.

What is an enclosed space?

An enclosed space is a space which can be identified by asking the following questions:



If the answer to one of these questions is 'YES', the space should **not** be entered until an appropriate risk assessment has been carried out.

Some enclosed spaces may not be immediately obvious, such as a storage room or a cargo hold. Furthermore, an enclosed space may initially be considered safe, but if adjacent to an unsafe space, it can soon become unsafe if migration of hazardous vapour occurs.

The risks

Enclosed spaces are dangerous due to the lack of oxygen. Low oxygen levels can be a result of oxidation inside empty tanks or works that have been carried out, such as welding or cutting, a chemical reaction or a bacterial action. In addition, cargoes can absorb oxygen or emit gasses which displace oxygen or are inherently dangerous.

A shortage of oxygen affects the brain faster than any other part of the body. Oxygen levels below 10% will cause unconsciousness and if levels drop below 5%, brain damage will be permanent. Furthermore, the individual can die within minutes if not resuscitated and removed to a fresh atmosphere.

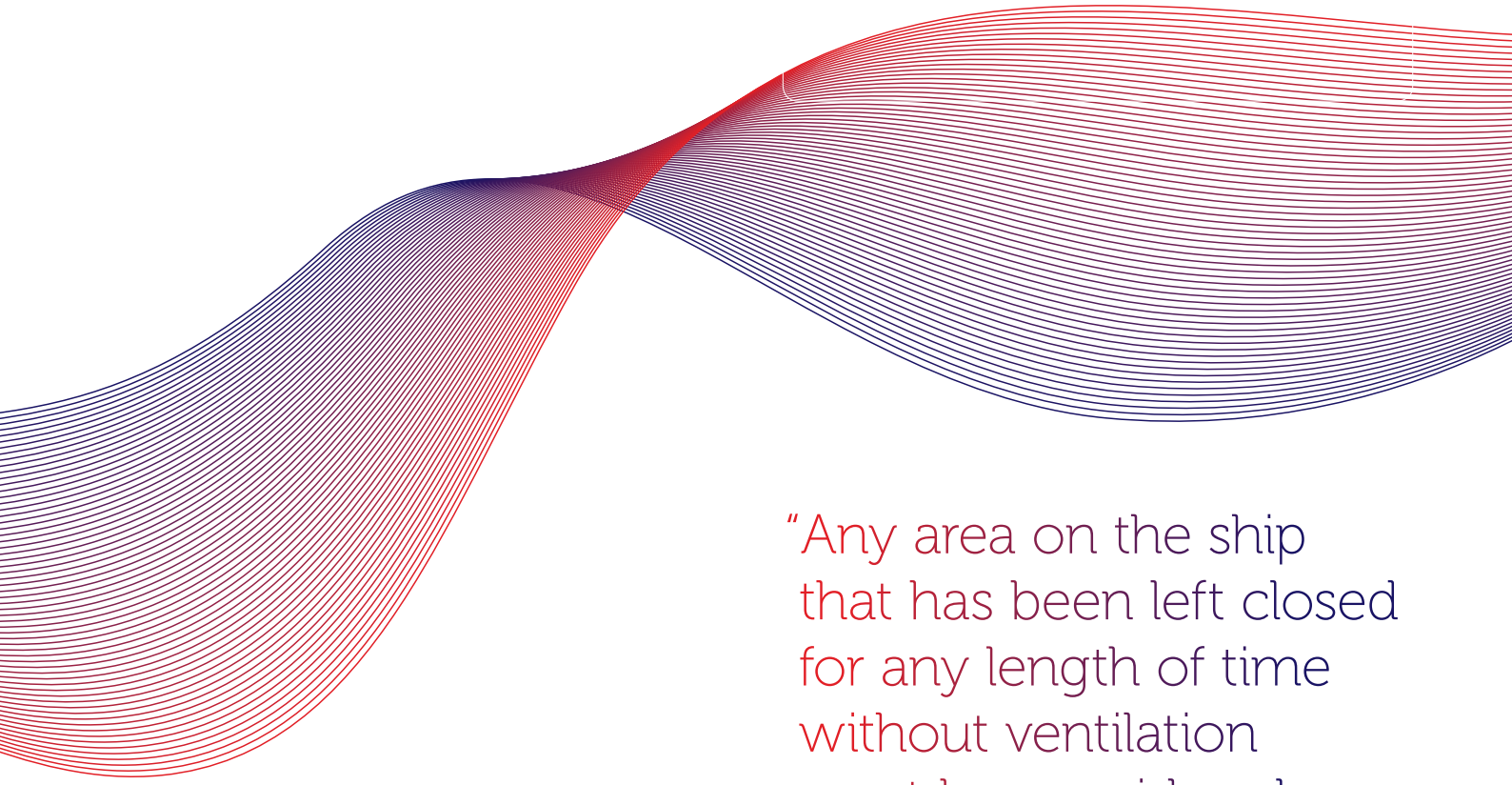
Other contributory factors are insufficient knowledge, training and understanding of the dangers related to enclosed spaces. Humans are used to act on emotion and panic may result in impulsive actions. Over the last couple of years we have seen many cases where, during an emergency, Personal Protective Equipment (PPE) or rescue equipment is not used and the rescue attempts are not coordinated correctly.

Fatalities and injuries happen with regularity and most of them have a similar story.

Claims example

A person enters an enclosed space without performing a risk assessment, not taking precautionary measures and loses consciousness. Another person notices the first person lying on the floor and, without thinking, goes inside the space to assist. He also collapses due to the low oxygen level.

Sadly it often doesn't stop with the second person, as there will be a third or even a fourth one trying to perform a rescue operation and simply forgetting to take care of themselves. These uncoordinated rescue attempts can easily result in multiple severe injuries or fatalities, most of which could have be avoided if the correct procedures had been followed.



"Any area on the ship that has been left closed for any length of time without ventilation must be considered dangerous".

How to prevent accidents

The IMO has produced two recommendations to minimise the continued loss of life resulting from personnel entering shipboard spaces in which the atmosphere is oxygen depleted, oxygen enriched, toxic or flammable. These recommendations are mandatory for all ships (SOLAS Chapter III Regulation 19.3.6 and SOLAS Chapter XI 1, Regulation 7). Furthermore, the ISM Code requires that all known risks on board ships have to be identified and taken account of. Enclosed spaces are known risks, so this requirement should be fulfilled. These requirements are set out below:

- **Risk assessment**

  Before entering an enclosed space, a risk assessment must be carried out. The purpose of such an assessment is to:

  – identify the hazards;

  – deciding on the control measures; and

  – finding alternatives or solutions to mitigate the risks.

  A risk assessment should be carried out each and every time before entering an enclosed space or any other area that is potentially dangerous.

- **Work permit**

  In addition to the risk assessment, an authorised work permit should be issued by the safety officer or the master. This document should specify:

  – the exact location of the planned work;

  – the nature and the limitations of the work;

  – potential hazards;

  – the precautions to be taken;

  – actual oxygen levels and gas presence; and

  – which protective equipment should be used.

  The work permit has to be signed by all parties involved and recorded.

- **Drills**

  Regular drills will help crew members to understand and anticipate the dangers associated with enclosed spaces. They will become familiar with the rescue procedures and the rescue equipment. Training to enter enclosed spaces in a safe environment gives crew members valuable hand on experience and the confidence needed in a real emergency. To be effective, the drills should be as realistic as possible and repeated every two months. Enclosed spaces drills should include:

  – defining the enclosed spaces on board of the vessel/unit;

  – testing the use of PPE and rescue equipment;

  – testing the use of communication equipment and procedures;

  – testing and using instruments for measuring the atmosphere in enclosed spaces;

  – first aid and resuscitation techniques; and

  – thorough evaluation of the drill and identification of areas that have to be performed.

"Practice does not only make perfect, it also makes the training and the knowledge permanent and instinctive".

Conclusion and recommendations

Fatalities will only be prevented when ship owners and managers implement and ensure compliance with procedures on board. Regular drills will help crew members to understand the dangers and make them familiar with the rescue procedures. Most importantly, all potentially dangerous spaces should be clearly identified on board by warning signs posted adjacent to their access points.

General recommendations:

- ✓ Strictly follow all shipboard procedures.
- ✓ Enclosed spaces should be identified and clearly marked.
- ✓ The space has to be well ventilated before entry.
- ✓ A thorough risk assessment to be carried out prior work.
- ✓ A proper permit to work has to be filled out and signed.
- ✓ The space has to be checked for oxygen content and other gas content by means of a calibrated oxygen analyser and gas detector.
- ✓ An oxygen analyser and gas detector should always be carried while being inside the enclosed space and it should be on all the time to monitor the oxygen content. As soon as level drops, the analyser should give alarm and the space should be evacuated as soon as possible.
- ✓ One person always has to be standby at the entrance of the enclosed space to communicate with the persons inside.
- ✓ Adequate rescue equipment has to be present at the entrance to the enclosed space.
- ✓ The rescue equipment has to be used without a doubt in an emergency.

The recommendations of the IMO for entering enclosed spaces, together with an example of an entry permit, can be found here.

Should you require more information or assistance, please feel free to contact our Client Services Desk: **ClientServicesDesk@msamlin.com**

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