

## The Dangers of Confined Spaces

### Introduction

The Managers' review of major claims incurred in 2009 shows that as in previous years the greatest number of these concerned crew. The majority of crew claims involved either loss of life or personal injury, and most frequently occurred when work was being undertaken in confined spaces.

The risks associated with such operations should be well known since much has been written about the dangers. To control the risks, pursuant to the ISM Code, Safety Management Systems contain detailed procedures on the subject of entry to confined spaces. Yet, despite these measures lives continue to be lost unnecessarily and so there is clearly need for continued loss prevention focus on this issue.

### A Confined Space and its Atmosphere

Confined spaces on a ship are those which, because of their configuration, hinder the access of crew, and which present dangers because of the potential for an unsafe atmosphere within them. This can arise because the atmosphere is either oxygen deficient or because of the presence of gases or vapours hazardous to human health. Frequently, unsafe atmospheres have no detectable odours present, making them all the more difficult to identify.

It is therefore of paramount importance that before entry into any confined space is permitted, it should



be thoroughly ventilated and the atmosphere checked either by a competent person on board, or by a chemist to determine the oxygen level present and that it is free from toxic gases before crew entry is permitted. The space should also remain well ventilated and lit throughout the period when crew are within it.

Oxygen deficient atmospheres are the leading cause of fatalities occurring within confined spaces. Normal atmospheric conditions have an oxygen content of approximately 21%. An oxygen deficient atmosphere is one in which the oxygen content is less than 19.5%. Lack of adequate ventilation is the primary cause of most hazardous atmospheres within confined spaces.

Oxygen within a space may be depleted by a variety of causes; for

example displacement by the introduction of inert gases such as carbon dioxide, nitrogen, argon, or by the ship's inert gas or fire fighting systems. Oxygen within a confined space can also be consumed by corroding metal, the effects of drying paint or other coatings, and combustion or bacterial activity.





No crew member should ever be allowed to enter a confined space before the atmosphere within it has been tested, re-checked as necessary after corrective action, and the results logged to determine that the space is safe to enter.

### Safe Entry Procedure to a Confined Space

Before entry is made to any confined space, the following steps should be taken:-

(i) A meeting should be held with all parties involved to discuss the safety measures that will be necessary for the task that requires entry to the confined space.

(ii) All actual or potential hazards should be identified, recorded and rectified where possible.

(iii) All safety and permit to work requirements must be fully complied with and the crew entering the confined space and those on standby at the entrance must know exactly what to do should any emergency arise. It is particularly important that

no one should enter the space to attempt a rescue without breathing apparatus. It is a natural and understandable human reaction to promptly attempt to assist another who is in difficulty. However, entering a confined space without the proper safety equipment in such circumstances generally results in the rescuer also becoming a casualty. Far too many lives have been lost unnecessarily in the past as the result of such actions.

(iv) No crew should ever be permitted to enter a confined space alone and un-tethered, and crew should never be left in a confined space without back up assistance positioned outside the space they are in.

(v) Crew providing back-up assistance should have radio equipment and breathing apparatus on station at the entrance to the enclosed space, and should be fully familiar with emergency response procedures if any of the crew in the space find themselves in difficulty.

(v) Warning signs should be displayed to alert others to the fact that crew are working within the confined space.



(vi) Any equipment or systems that could affect conditions within the confined space whilst crew are within it should be disabled and tagged to warn that crew are working in the space it serves.

### Conclusion

Through adherence to safety management and permit to work procedures, regular training in the use of safety equipment and effective emergency response drills, the risk of casualties involving crew working in confined spaces can be significantly reduced. It is in the interests of all concerned, but particularly the individuals undertaking work in confined spaces, that lessons are learned from the unnecessary casualties of the past to eliminate the potential for recurrence. The issues involved are neither new nor complex and it is now time to ensure that safety procedures are effective in ensuring that claims of this type are consigned to history.

For further information on this or other Loss Prevention topics please contact the Loss Prevention Department, Steamship Insurance Management Services Ltd.

Tel: +44 20 7247 5490; Email: [loss.prevention@simsl.com](mailto:loss.prevention@simsl.com)