

# MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

## FLYER TO THE SHIPPING INDUSTRY Entering Dangerous Enclosed/Confined Spaces

Three experienced and qualified seafarers died as a result of entering the anchor chain locker on board a North Sea Emergency Response and Rescue Vessel (ERRV).

While attempting to secure a rattling anchor chain within the chain locker, one seaman collapsed. The supervisor raised the alarm and then entered the chain locker to rescue his shipmate; he too collapsed. Both men died as a result of the oxygen deficient atmosphere inside the chain locker; this was due to the natural on-going corrosion of the steel structure and anchor chain.

During the consequent rescue efforts, the would-be rescuer could not fit through the access manhole of the chain locker when wearing Breathing Apparatus (BA), so he entered wearing a Sabre ELSA type Emergency Escape Breathing Device (EEBD). As EEBDs have significant limitations when used other than for their designed purpose, the rescuer was forced to remove the hood, and he too was overcome by the lethal atmosphere inside the chain locker; he died as a result.

The Regulations<sup>1</sup> define a “Dangerous Space” as:

*Any enclosed or confined space in which it is foreseeable that the atmosphere may at some stage contain toxic or flammable gases or vapours, or be deficient in oxygen, to the extent that it may endanger the life or health of any person entering that space.*

A simple inspection, taking only a few minutes, would have shown that this chain locker was effectively a tank, made air tight by expanding foam used to seal the spurling pipes. Even without the expanding foam this chain locker was a potentially dangerous enclosed/confined space, and a formal safe entry procedure should have been followed.



<sup>1</sup> The Merchant Shipping (Entry into Dangerous Spaces) Regulations, SI 1988/1638.

## Limitations of constant flow EEBDs

The time limited duration of the ELSA (or other similar constant flow type EEBDs) is achieved by means of a reducer/cylinder valve which restricts the flow of air from the cylinder to the mask, so that once activated a steady flow of air is provided to the wearer. It is not a demand valve system, and is not like that found on BA.

One significant disadvantage of the constant air flow arrangement is that it is possible for a wearer undertaking particularly strenuous activity to require a greater flow of air than the EEBD can supply. This might result in the hood collapsing in on the wearer's face, producing an unpleasant suffocating sensation; an instinctive reaction to this would be to remove the hood. In a dangerous atmosphere this could be lethal.

## Safety Lessons

Arguably, there can be few aspects of personal safety on board ships that have received more attention than the importance of following the correct procedures before entering a dangerous enclosed/confined space. Tragically, accidents such as this continue to happen.

### 1. Owners / Operators of vessels should ensure:

- That company policy regarding the requirement to enter dangerous enclosed/confined spaces on board their ships is clear, and that the equipment provided on board is adequate for safe entry.
- That crew training and drills for entering dangerous enclosed/confined spaces are as realistic as possible, always considering the overriding requirements of safety during such drills.
- That EEBD training is sufficiently realistic to ensure that the full extent of the limitations of this type of equipment is revealed to all potential users.

### 2. Seafarers should ensure:

- That they are able to recognise a dangerous enclosed/confined space, and are aware that in such spaces, the atmosphere could become lethal during routine shipboard operations. In order to enter such spaces, the MCA Code of Safe Working Practices and their company Safety Management System must first be consulted, and all due precautions taken.
- That they are fully aware of the purpose and limitations of the EEBDs carried on board their ship, and when it is necessary and appropriate to use these devices.

This flyer and the MAIB's investigation report are posted on its website:

[www.maib.gov.uk](http://www.maib.gov.uk)

Alternatively, a copy of the flyer and/or report will be sent on request, free of charge.

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