



Insight Article

Gard Alert: Enclosed space entry training

Accidents in enclosed spaces onboard ships have long been a source of serious injuries and fatalities. And they continue to be so despite the fact that there are few occupational safety aspects onboard ships that have received more attention than the importance of following the correct procedures before entering a dangerous enclosed space.

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Analyses of the accidents often show that the problem is not due to a lack of guidance. The underlying cause of many of the accidents, which could have been prevented, was rather failure to follow established procedures. “Investigations into the circumstances of casualties that have occurred have shown that accidents on board ships are in most cases caused by an insufficient knowledge of, or disregard for, the need to take precautions rather than a lack of guidance” says the IMO.

As of 1 January 2015 it became mandatory for all crew members with enclosed space entry or rescue responsibilities to participate in regular drills. This is to change a negative trend and ensure that those involved understand that the purpose of enclosed space entry procedures is not simply to satisfy ISM Code auditors, but to bring about actual improvements in safety.

Recommendations

- Ship operators must ensure that procedures for drills covering enclosed space entry and rescue to be held every two months are implemented onboard all relevant ships.
- The drills shall typically include checking and use of personal protective equipment, communication equipment and procedures; and instruments for measuring the atmosphere in enclosed spaces. It is also emphasised that each drill shall focus on efficient use of rescue equipment as well as first aid and resuscitation techniques.
- A drill should simulate a complete enclosed space entry work operation to be realistic and make use of all protective and safety equipment relevant for the space in question - from checking the atmosphere of the space to administration of first aid and resuscitating techniques. A realistic drill should also simulate rescue of an unconscious person from the enclosed space.
- It is important that the date and the details of the drill are recorded in the ship's log book. Lessons learned should be shared and procedures updated as necessary. If a full drill is not held at the appointed time, an entry shall be made in the log book stating the reasons and the extent of the drill or training session actually held.

We also recommend ship operators to:

- verify that that the enclosed space entry procedures are among the key shipboard operations in accordance with paragraph 7 of the International Safety Management (ISM) Code;
- review their existing procedures and ensure that IMO's revised recommendations for entering enclosed spaces aboard ships ([Resolution A.1050\(27\)](#)) are taken into account; and

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- properly train all personnel with enclosed space entry and rescue responsibilities so they are able to recognise, evaluate and control hazards associated with entry into enclosed spaces.

Gard's Case Studies for Safety Meetings

Gard regularly publishes Case Studies for safety meetings focussing on the risk assessment process and identification of the chain of errors that led to a particular incident. In light of the new SOLAS requirements entering into force at 1 January 2015, Gard has published the Case Study “[Entry into enclosed spaces](#)” and encourages ship operators to use it as part of their training - for comparison, analysis and discussion among officers and crew onboard their ships.

Recurring accidents in enclosed spaces

An enclosed space is in principle any workplace with restricted access and egress, not subject to continuous ventilation and not designed for continuous worker occupancy.

The two main concerns related to enclosed space entry are lack of oxygen and the presence of harmful gases or vapours. The depletion of oxygen in the atmosphere of an enclosed space may occur for a number of reasons. One example is rusting of steel constructions within such spaces, which may consume oxygen. Other examples are commodities which absorb oxygen and cargoes emitting gases which displace the oxygen or are themselves poisonous. Cargo under fumigation can also be a source of toxic gases. Often apparently harmless cargoes such as wood chips, wood pellets or pulp wood can be the cause of accidents. Already in 1999 Gard published an article describing an incident where a person lost his life as a consequence of entering a cargo hold loaded with sawn soft wood. In October 2014, a similar case was presented to Gard and yet again a ship loaded with forest products, this time wood chips, experienced an enclosed space accident – unfortunately with the same tragic outcome.

However, many solid bulk cargoes are liable to deplete a cargo space or tank of oxygen. These include, but are not limited to, most vegetable and forest products, ferrous metals, metal sulphide concentrates and coal cargoes. In accordance with the IMSBC Code Section 4.2, the cargo information provided by the shipper shall include flammability, toxicity, corrosiveness and propensity to oxygen depletion of the cargo, if applicable.

More than once the additional tragedy of these 'enclosed space accidents' has also been that two or more people die. Those killed include people working in the enclosed space and those who try to rescue them without proper training and equipment.

Future requirements

Mandatory requirements for portable atmosphere testing instruments to be carried on board ships are expected to enter into force in 2016 under SOLAS Regulation X-1/7. These portable testing instruments will not be used as part of personal protective safety equipment, but as part of the ship's equipment. They will be used to test

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enclosed spaces from the outside to ensure they are safe to enter and will cover, as a minimum, the following gases: oxygen, flammable gasses or vapours, carbon monoxide and hydrogen sulphide.

Ship operators are recommended to provide appropriate portable atmosphere testing instruments onboard every ship at the earliest opportunity. Guidelines for selecting portable instruments can be found in [MSC.1/Circ.1477](#).

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