

ENCLOSED SPACE MANAGEMENT SYSTEM

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It would be inconceivable for a ship or marine installation to operate without a fire plan which identifies the whereabouts of all fire equipment and the identity of the designated emergency response team.

Even at the design stage of the ship or installation considerations for reducing the risk of fire is incorporated into the build process, fire doors, access to fire



hydrants, emergency escape routes and the use of fireproof materials are a few examples of this. Without doubt, fire at sea has been considerably reduced because of the advances made in equipment, training and design. It would be gratifying to say that this was done voluntarily by the marine industry but unfortunately,

without legislation enforcing standards, training and equipment, many ships and installations today would not have such fire management systems in place.

Attaining that legislation was not easy, it took many years to gradually arrive at the stage we are at today, but without those who worked and fought for those standards, undoubtedly many more ships and lives would have been lost.

It would be pleasant to say that this concern in reducing fire at sea was inspired by the deaths of the seamen, but it was the loss of the ships that gave the impetus to provide adequate fire prevention design and provide equipment for dealing with a fire situation.

That leads us to enclosed spaces. If the problems of these spaces endangered the ships rather than lives, there would undoubtedly be robust legislation in place similar to that dealing with fire.

Yet over the years, with reducing crew numbers, changes in cargoes, increasing amounts of chemicals being carried and the nature and design of enclosed spaces, the pressures of work and the accompanying fatigue has resulted in a gradual increase of enclosed space incidents, until they now have reached a critical situation, with more people injured or dying in enclosed spaces than through any other related on board work activity.

Without any legislation in place, the methods for coping with enclosed spaces on ships and installations are risk assessment driven based on individual company safety management systems. In some instances this system may be flawed and vary from a comprehensive range of risk assessments with one for each space, to just one generic risk assessment regardless of any particular hazards or design features associated with each individual space .

In the majority of cases, in depth knowledge of any particular space rests purely with the local knowledge gained by those on board and when they leave that knowledge goes with them compelling the next crew to start the whole learning process again. It can be said that on the majority of ships, regardless of their safety regimes, there is little consistency in the overall control and protection of these spaces.

As if the potential for failure wasn't complex enough, the situation is compounded when introducing shore workers, who are often required to work in these spaces. They are in a potentially more precarious position than the crew, as they have no prior knowledge of any poor design features, or hazard



problems. Even if they are shown the risk assessment, this will probably not include such information. There exists a dependency that the marine Industry has similar robust training and rescue procedures as the shore industries which, of course, is not the case.

This attitude towards contractors may well be caused by the confusion over the responsibilities issue that exists in the marine Industry.

The assumption in many companies that contractors are responsible for the safety of their workers or that a port of dry dock can issue an indemnity stating they accept responsibility for safety of their workers while on board the ship or installation is very unsafe, especially when considered internationally, as many countries are quite definite in their legal interpretation that, while the ship or installation is under management, in other words, not a 'dead ship', then the Captain or manager, of that ship or installation is responsible.

Fifty years ago, Hopkins in 'Business and Law for the Shipmaster' wrote; 'Stevedores and other contractors who board a ship as invitees and persons who come on board as licensees for their own private purposes or as guests, are all entitled to adequate provision against pitfalls and traps. Apart from specific regulations, the Master has a common law duty to provide such protection.'

Nothing has changed.

The Enclosed Space Management System

Similar to the fire situation, the enclosed space problem will only be dealt with effectively by definitive legislation rather than suggestions, particularly in relation to enclosed space training, equipment and effective rescue arrangements, however in the meantime there are certain measures which can be put in place that would considerably alleviate the problem. The most obvious of these is that ships and installations should adopt an enclosed space management system similar to the fire fighting arrangements which have served the marine industry so well since their implementation.

For several months now, staff at Mines Rescue Marine have been working on an enclosed space management system which will provide those on board, whether crew, shore contractors, visitors or company representatives, with a better system of protection than presently exists.

The main aims of the system are to:

1. Offer protection to all those working on board;
2. Be simple to understand and use;
3. Cope with the disparity of ships, installations, companies & their respective procedures;
4. Provide a comprehensive risk assessment for all spaces;
5. Provide a basis for the initial entry of all enclosed spaces regardless of their type and where necessary, deal with responsibility issues.
6. Provide a continuity of knowledge of the spaces on a ship or installation.

It must be understood at the outset that the enclosed space management system does not deal with the lack of training, equipment, and design enhancements which currently exist in varying degrees throughout the entire marine industry, however, it does increase awareness by highlighting potential problem areas thus supporting a culture of safe practice and for the first time provide a comprehensive knowledge data base of all enclosed spaces.

Once adopted, the system will:

- Provide a definitive list of all enclosed spaces.
- Be easy to access and understand and therefore capable of updating as it is intended to be a 'living document'.
- Reduce existing paperwork
- Have the ability to be implemented in any fleet or collective of installations regardless of their disparity in size or type.
- Cope with the problem of continuous crew changing.
- Provide instant up to date information to both on and offshore offices.
- Deal with the responsibility issue between the ship/installation, company and outside contractors.

Categorising Spaces

The confined space management system is based around a simple traffic light warning system already implemented and working successfully in industry ashore.

Under this system the ship or installation would define the three types of enclosed spaces based on a physical audit and not just the previous contents of the space, consideration would be given to the degree of difficulty of entry/exit, freedom of movement within and ability to rescue from any particular space. Examples are as shown below:

Green Tag,

Means that they are considered safe for normal use and unless temporarily re-categorised, there is no need for special precautions to be made before entering. No work permit is required. Sole worker entry is permitted

Amber Tag,

Means that certain precautions may have to be taken prior to entry. A work permit will be required for entry. Sole worker entry is not permitted.

Red Tag,

Signifies what is classed as a risk space and that it is not to be entered without Senior officer authority and would require pre entry procedures carried out. Rescue team to be on standby.

Any space from which there is considered a difficulty for rescue will be classified as a Red space regardless of any risk assessment.

Methodology

To begin the process, a full audit of all spaces where workers may have to enter should be undertaken. Each space should be given a unique identification number and its' location recorded on the enclosed space list and annotated onto a ships plan. The audit must be comprehensive and cover all aspects of the space both internally as well as externally if possible. Where

available, previous risk assessments should always be referred to for background information.

Once all spaces have been audited and listed, they will be colour categorised.

Against each space the updated risk assessment and colour code will be attached. Together with the unique space information the department and rank of the authority required for entry permit will be noted. Any other department or supervisors to be notified of entry will also be listed.

The information will initially be paper based but preferably then transferred to an electronic database on the ships main computer for ease of access and amendment. Held electronically, the information can then be shared with all interested parties when required.

Enclosed Space Audit

Whilst recognising that the audit process will undoubtedly be time consuming, once completed, it will not have to be repeated, unless major modifications to the space have been made. It must also be noted that, any outputs from these audits are wholly dependent on the auditor, therefore always be mindful that to carry out this process the auditor should at least have a good understanding of enclosed space procedures.

The format of the enclosed space management audit looks particularly at four areas:

- Potential dangers
- The entry point
- The enclosed space
- Capability of rescue

The first section deals with potential dangers and looks at the existing Risk Assessment for that particular space. A review of the risk assessment will highlight previously identified hazards and the relevant control measures which can be updated and recorded. In the absence of an existing risk assessment one will have to be carried out and the information documented.



Section two moves onto ‘the entry point’ and in particular reviews the space available at the entry point for entry and rescue equipment, the height and width available to erect man riding winches, the availability of anchorage points, whether the entry point is inside or open to the elements, is their adequate lighting at that point, are communications viable and most importantly the type and dimensions of the entry point, whether horizontal or vertical.

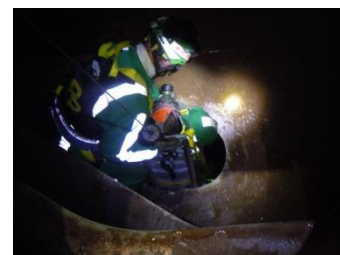
Section three deals with ‘the space’ itself and in particular identifies the



previous contents, if the space has to be entered vertically the depth and condition of internal ladder systems, the internal distance to be travelled within the space, the presence of obstacles (pipes etc.) or internal design issues such as lightning holes which would impair travel or indeed rescue operations. Other issues such as internal height and/or width restrictions would be recorded as would be the potential presence of solids, liquids or gases which could present additional hazards. Completing this section would be a review of communication feasibility, presence or absence of internal lighting and ventilation requirements.



The final section addresses the thorny issue of ‘rescue capability’ and would consider how, should the need arise, a rescue team would recover a casualty to the entry point and transfer them onto the medical centre.



The information derived from the audit process will then be analysed and recorded onto an electronic data spread sheet, when completed, together with the relevant risk assessment, colour coding and ship or installation plan identifying the location of that particular enclosed space will the form part of the overall enclosed space management system.

As an added bonus, the nature of this computerised enclosed space management system allows for it to be accessed instantaneously by the office ashore, enabling ship/installation/company interaction in order to review information in a 'real time' situation and collectively formulate solutions

Contractors

One of the main beneficiaries is contractors who are increasingly being used on board to carry out work. The enclosed space management system helps to underpin and support the masters/managers responsibility of care toward all persons on their ship or facility.

The system will be capable of providing a full printout of any particular space together with the relevant risk assessment, observed hazards, recommended rescue equipment and rescue team availability. This information can be sent direct to the contractor prior to the work commencing in order to help with the compilation of their safe system of work and rescue arrangements. Issues or discrepancies, such as particular hazards, training and equipment or rescue arrangements can be flagged up and resolved in advance.

In this way, for the first time in the Marine Industry, all workers, whether from the ship, installation or from ashore may be provided with comprehensive information regarding all enclosed spaces at the workplace. In addition, and probably more importantly, it ensures that there is an effective exchange of safety information between the ship/installation, managing offices and contractors.

Conclusions

The simplicity of the enclosed space management plan should now be apparent. The main benefit being that any worker tasked with entering an enclosed space can refer to the electronic database for that space and download relevant information regardless of their previous work history at that location. The system should be regarded as a living document which

contains an up to date and permanent record of information of all enclosed spaces on that ship or facility.

If this system could be adopted by the Marine Industry as a standard requirement it would for the first time place enclosed space safety management on the same level as fire management. It would also ensure that, for the first time, there exists comprehensive knowledge of enclosed spaces and their individual dangers on each ship or installation and allow access to that same information by the operating office of the ship and equally as important, provide a safety net for shore workers when engaged in work in these spaces.

Recently, within just a few months we have seen 5 men die on an Indian ship in the Indian Ocean, and more recently 3 men die on a Syrian ship. Unfortunately, the incidence of enclosed space related fatalities and accidents appears again to be on the increase and until the IMO finally accepts that legislation must be enacted focusing on enclosed space training and equipment, the onus of action on this major marine industry problem lies with the shipping and oil companies themselves. The many booklets and posters put on ships with regard to enclosed space precautions litter the alleyways but the death toll keeps on rising. Surely this tells us that something is wrong with our approach.

Perhaps placing safety posters in the boardroom as well as the ships and a visit to a double bottom space by the Chief Executive may have far more effect on this aspect of safety culture in the marine industry.