

SURVEYOR'S NOTES

CO₂ FIXED FIRE FIGHTING SYSTEMS OPERATION AND MAINTENANCE

The club continues to see major fire casualties where failure to release the CO₂ in a timely and correct manor has contributed to the fire's devastating effect. Officers and crew simply did not know how to activate the CO₂ fire extinguishing equipment.

This article is focussed on CO₂ systems, but it also applies to fixed fire fighting systems of all types.

CASE STUDY: CO₂ FIRE EXTINGUISHING SYSTEM NOT PROPERLY ACTIVATED

A large bulk carrier experienced an oil leak on a low pressure lubricating oil line, which sprayed oil onto a hot exhaust. The fire rapidly took hold in the engine room and the engine room was evacuated, all vents and fans shut down and closed. Fuel trips were activated. The chief engineer went to activate the fixed CO₂ fire extinguishing system situated in the CO₂ room and did so by pulling the appropriate handles – or at least he thought he had activated it. The fire burnt for a number of days with the CO₂ failing to have effect. The engine room was completely destroyed and the ship was a constructive total loss.

The fire was investigated and it was found that the CO₂ system had not actually been released and the CO₂ remained in the bottles. It was also found that the fire dampers in the ventilation ducts had not been fully closed.

It is imperative that all officers, particularly all senior officers, have a full understanding of how to activate the CO₂ fire extinguishing system. In the above case, the officer had failed to open all the delivery valves. Apart from being a familiarisation requirement when first joining a ship, training should be given at regular intervals, especially to new joiners in how the CO₂ or fire protection/smothering systems operates.



^Ensure that the ship's vents are shut down effectively



^The result of an engine room fire



^Switchboard after an engine room fire



^Know how your CO₂ system works

All ships must have:

- familiarisation procedures for critical equipment
- clear instructions available in the CO₂ room showing how to activate the system
- annual Flag/Class safety equipment surveys
- training that checks that officers know the system
- company inspections to ensure that officers are aware of how to operate the fixed fire-fighting systems

Ideally, every member of the ship's crew should be taught how to release the CO₂ and be given appropriate training in safety drills.

UNDERSTANDING CO₂ FIXED FIRE FIGHTING EQUIPMENT SYSTEMS

The club's surveyors recently have seen a number of occasions where the senior officer accompanying the surveyor was unable to demonstrate how the CO₂ and other fire fighting systems should be operated. This includes:

- master and chief officer on an oil floating storage tanker
- second engineer on an offshore anchor-handling ship
- chief engineer on a passenger ferry

In each case, the officer said that he needed to read the instructions before being able to operate the equipment and then proceeded to demonstrate the operation of the equipment incorrectly. If errors are made during a demonstration, who knows what will happen during the crisis of a major fire?

In addition, it has been seen that often the operating instructions are not complete or clear. It is important to make sure that the instructions are clear and operating valves clearly marked. In a true emergency, there is often panic and stress and so officers need be fully familiar with how to operate the system.

UNDERSTANDING THE ENGINE ROOM LOCALISED CO₂ RELEASE SYSTEMS

During a recent survey, one of our surveyors saw the following sign on the local engine room fixed fire fighting CO₂ release box, located outside of the engine room. It states:

**“Caution – Do not open and do not touch!
Opening this box will cause the main engine
to stop suddenly when underway???”**

**“Do not use the CO₂ box key without the
consent of the Master, Chief Engineer/2nd
Engineer”**

This indicates a complete lack of knowledge of what will occur when the localised CO₂ control box is opened. The box will activate an alarm, which is supposed to indicate to any personnel within the engine room that CO₂ is about to be released into that space and the engine room ventilation fans will shut down. It does not shut down the main engines. If there is this level of misunderstanding of the CO₂ release system, then an efficient release in an emergency is unlikely. It should be a part of the safety checks that the cabinet alarms and ventilation stops are operational



^A warning sign, good or bad?

CO₂ FIXED FIRE-FIGHTING EQUIPMENT MAINTENANCE

The fixed fire-fighting systems should be included in any planned maintenance system and regular statutory inspections and tests carried out. Fixed fire-fighting systems should also be checked by ship's personnel after any shore maintenance has been carried out to ensure that the system has been left in an operational state. This therefore requires senior officers to know their systems well.

During a routine survey of a passenger/freight ferry, the engine room CO₂ fixed fire-fighting system had been recently checked by shore technicians and the surveyor noticed that a screw cap fitting that blanks off the pipeline testing connection had accidentally been left off. The system had been reinstated and was thought by all personnel to be in a state of readiness. Had the CO₂ been released, then the gas would have filled the CO₂ room and not been dispersed into the engine room. Check your CO₂ system after routine maintenance.

On another survey, a senior deck officer was unable to identify a series of large valves situated on the main deck. The surveyor then explained that this was the water drenching system for the ro-ro decks. The senior officer, although new to the ship, had been onboard for a month. Good familiarisation is key when taking over a new ship.

These examples are isolated, but significant in number to be of concern. Most ships do have the necessary familiarisation procedures in place.

SURVEYOR'S NOTES CONT.

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^Sprinkler instruction chart in a language unfamiliar to the officers and crew



^CO₂ release systems can be complex. Have clear signage



^Sprinkler valves on the main deck. No instruction or identifying stencils



^Cap left off

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