

### **CO<sub>2</sub> FIXED FIRE FIGHTING SYSTEMS OPERATION AND MAINTENANCE**

This article is focused on CO<sub>2</sub> systems, but it also applies to fixed fire-fighting systems of all types.

#### **– CASE STUDY: CO<sub>2</sub> 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 CO<sub>2</sub> fire extinguishing system situated in the CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> system had not actually been released and the CO<sub>2</sub> 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 CO<sub>2</sub> fire extinguishing system. In the above case, the officer had failed to open all the delivery valves. Apart from being a familiarization requirement when first joining a ship, training should be given at regular intervals, especially to new joiners in how the CO<sub>2</sub> or fire protection/smothering systems operates.

All ships must have:

- familiarization procedures for critical equipment
- clear instructions available in the CO<sub>2</sub> 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 CO<sub>2</sub> and be given appropriate training in safety drills.

## – UNDERSTANDING CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> RELEASE SYSTEMS

During a recent survey, one of our surveyors saw the following sign on the local engine room fixed fire-fighting CO<sub>2</sub> 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 CO<sub>2</sub> box key without the consent of the Master, Chief Engineer/2<sup>nd</sup> Engineer”**

This indicates a complete lack of knowledge of what will occur when the localized CO<sub>2</sub> control box is opened. The box will activate an alarm, which is supposed to indicate to any personnel within the engine room that CO<sub>2</sub> 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 CO<sub>2</sub> 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.

## – CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> been released, then the gas would have filled the CO<sub>2</sub> room and not been dispersed into the engine room. Check your CO<sub>2</sub> 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

familiarization 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 familiarization procedures in place.

---

*(Article extracted from The Standard Club's publication – Standard Safety)*

### 何 恩 洪 律 師 行 JAMES HO & CO. Solicitor

Rm. 1403 14/F., Blissful Bldg.,  
243-7 Des Voeux Rd Central,  
Hong Kong

地址：

香港上環德輔道中243-7號  
德佑大廈1403室

Tel: (852) 3421 1330

Fax: (852) 3421 1339

Mobile Phone: 9034 3360

E-Mail: [james.ho@yanhung.com](mailto:james.ho@yanhung.com)

#### Contact:

#### James Ho, Chartered Shipbroker

LL.M.(Lond), LL.B., F.I.C.S.,  
M.C.I.Arb., ANZIFF (Fellow).

Practice Area:	業務範圍:
• Arbitration	仲裁
• Civil litigation	民事訴訟
• Personal Injury	工傷賠償
• Criminal litigation	刑事訴訟