

# Keeping the systems of defence intact

Ensuring that extinguishing installations are always ready for actuation is critical in preventing tragedies at sea, says Carl Hunter, CEO and managing director at Coltraco Ultrasonics



▲ The Portalevel MAX Marine tests fire suppression units for leaks

Fires on board ships can be devastating, to crew, vessel and cargo. Fire safety standards on board cannot afford to slip. Part of this issue is to do with the maintenance of gaseous fire extinguishing installations, which may be a result of the holes in the regulations. With the recent difficulties that the shipping industry is facing, there is a need for practical, cost efficient solutions to safety issues. However, maintaining high standards of fire safety practice does not have to be expensive or time consuming.

The danger is shown in the statistics. A study published by the Finnish Transport Safety Agency showed that almost 800 fires happened in European waters between 2004 and 2014; 10 per cent of these were classed as serious. Further to this, around 200 of these incidents required external support to deal with the fire. In some of these cases, the fire suppression installations may not have been at their full capacity, which led to the uncontrollable fires.

A clear example of this is *MSC Flaminia*. In July 2012, the container ship was exposed to an uncontrollable fire which tragically led to three fatalities and two severely injured crew members, as well as major damage to the ship structure and its cargo. In this example, the CO<sub>2</sub> system failed when it actuated without instruction in the engine room – although the discharge was intended for cargo hold 4 – which turned off the auxiliary boiler and auxiliary fan for the main engine. This led to an out of control fire which required three salvage tugs to deal with it.

The extent of the fire meant that the salvage teams could not enter the vessel for four days. Cargo areas 3-7 in the ship were significantly damaged, and the ship's structure was weakened, requiring replacement. Under the pressures, the hatch covers lost their integrity and bulkheads were severely damaged, which led to water ingress in all the cargo.

Chances must not be taken when lives are at risk – and when a vessel is at sea, this is all the time. We call this the 'ungoverned space' – the area where either the regulations or the protecting systems of the critical infrastructure are not effectively providing consistent and reliable safety.

Gaseous extinguishing installations are difficult systems. There are few who understand them in all their complexity, although they are an essential defence against the risk of fire at sea. The main factor that needs to be understood is that the system must be able to actuate (release its gas) in the event of a fire. This may seem like an obvious point, but what if the extinguishing installation cannot actuate fully because there isn't enough gas within the cylinder? Gaseous extinguishing systems are highly pressurised, and the risk of leaking and discharging is accepted as part of their use.

The SOLAS FFS code specifically states that the crew must test extinguishing installations in between periodic inspection, maintenance and certification. Having the annual inspection by accredited marine servicing companies is not enough – the crew must take responsibility for their own fire protection. However, they are often not trained or certified to shut-down, dismantle, weigh and re-install the gaseous cylinders.

ISO 14520-1 states: "If a container shows a loss of agent quantity or a loss of pressure (adjusted for temperature) of more than 5 per cent, it shall be refilled

or replaced." Given that the gaseous systems are designed specifically for the individual needs of the vessel, a 5 per cent loss of agent may mean that the cylinders would not fully extinguish a fire. The only way to determine if a cylinder is free from leakage is to check its contents. But if the crew cannot weigh their own cylinders, because they are not certified to do so, then how is it possible?

The Portalevel<sup>®</sup> MAX Marine from Coltraco Ultrasonics tests the CO<sub>2</sub> fire installations onboard for leaks. The system is designed primarily for the vessels' crew to inspect large fire suppression systems of up to 600 cylinders. The ease of operation in comparison to weighing enables more regular and frequent checks, improving fire safety management onboard. The innovative method of inspecting leaking cylinders with ultrasonics enables identification in under 30 seconds with one person, instead of the traditional 15 minutes with two people laboriously weighing.

Using ultrasonic technology to pinpoint the liquid level of suppressant agent in the cylinders of the extinguishing system testing is quicker and easier. The Portasteele<sup>®</sup> Calculator is an advanced application that converts the liquid level height of CO<sub>2</sub>, NOVEC<sup>™</sup> 1230 and FM-200<sup>®</sup> liquefied gaseous extinguishant agent readings taken on an ultrasonic non-destructive liquid level indicator device into the agent weight/mass. Furthermore, the device can convert an expected agent weight back to the required liquid level, allowing users to anticipate where the level should be. The tool has widely been recognised by awards, as a finalist in the Safety at Sea Awards 2017 and the Tanker & Trade Awards 2016.

Maintenance of installations must be a priority. It need not be expensive nor time consuming, and tragic case studies of incidents such as *MSC Flaminia* prove that fire safety onboard can never be ignored.



◀ Corroded or damaged cylinders can prevent fire suppression systems from actuating when needed