



A shift in oil spill prevention

The maritime passive safety sector is a market that is rapidly developing in response to governments across the globe tightening the ecological requirements of shipping legislation. The aim is to encourage the shipping industry to prepare, well in advance, for a better handling of the environmental consequences of accidents and incidents at sea. As Gilles Longuève, General Manager of JLMD Systems and President of the Maritime Passive Safety Association (MPSA) reports, this represents a significant new mindset, breaking away from the unrealistic concept of zero risk.

Over the last few years, investment in the field of maritime safety has focused on technologies that help prevent accidents occurring in the first place. Examples of such 'active safety equipment' include radar, embedded computing systems and smart automatic piloting systems. All these technological offerings have the same objective – avoiding accidents and incidents at sea. However, even if they are a must-have, such active safety systems have their limitations, as evidenced by environmental disasters such as the Exxon Valdez or the Prestige oil spills.

One of the main conclusions to be drawn from these incidents is that the concept of zero risk does not exist. Despite this, much of the shipping sector has yet to really develop a culture of crisis preparedness, rarely having a comprehensive environmental management plan in place to handle an accident at sea. Indeed, when a ship is damaged, it is nearly always left helplessly passive and totally dependent on coastal salvage operations. The subsequent delays in response can lead to unnecessary environmental pollution.

Caption: The Cassiopeia has been fitted with fast oil recovery systems (see inset)
Source: JLMD/MPSA

In the light of the growing fragility of marine and littoral ecosystems, it is now crucial that ships provide the marine environment with maximum protection in the case of an accident. With this in mind, the maritime passive safety sector aims to enable crews to react more quickly and efficiently when an accident occurs, equipping vessels with systems that, being permanently installed onboard, can significantly reduce the environmental consequences of such accidents.

This new outlook on managing environmental risk at sea is winning over a growing number of shipping operators, who all agree that, given the race to develop ever larger vessels and the 40% increase in the shipping of hazardous materials over the past decade, environmental safety at sea should become a top priority consideration.

A growing European green business

The first research and development (R&D) work in the area of maritime passive safety was conducted some 10 years ago in Europe, leading to the development of a range of mature, efficient and certified technologies by several companies from Denmark, France and Norway. Many more innovations are expected to follow as an increasing number of manufacturers enter this fast growing market sector.

The main objective of the maritime passive safety sector is to equip new-build vessels and to retrofit existing ships with permanent onboard systems that can be deployed as soon as an accident has occurred and the ship is in danger (wreck, grounding etc). The aim is to contain and control any pollutants so as to be able to easily and quickly remove them and minimise any environmental impact.

In 2010, a number of players in this young green industry joined together to

An inspiring example

Passive safety in the car industry has provided an inspiring example to the maritime passive safety sector.

In the 1980s, car manufacturers, supported by public authorities, developed the first passive safety features for vehicles. The seatbelt designs, airbags, head restraints and side-impact bars have played a major part in reducing the number of casualties and deaths resulting from road traffic accidents across the globe.

Today, the automotive passive safety sector is a successful business, with a market value of some €3bn in Europe and \$18bn across the globe.



The refloated *Hundvaky*, with a temporary patch clearly visible

Source: Miko Marine/MPSA

form the Maritime Passive Safety Association (MPSA), through which they could offer a number of spill response technologies and proven solutions. These include:

- **Leak preventers** – such as the leak prevention valves developed by Danish company Presvac, which are fitted to cargo tank and bunker ventilation systems, allowing water to enter in the event of immersion while preventing potential pollutants from escaping. To date, Presvac has equipped some 50 vessels with its valves.
- **Magnetic patches** – magnetic patches can be quickly and easily deployed by crew and salvage operators alike after an accident has occurred, providing a temporary barrier that stops pollutants from leaking to the marine environment. Norwegian company Miko Marine has developed a wide range of patches that can be used to stop the ingress of water or the leaking of pollutants from breaches to hulls or from wrecks. These include magnetic and non-magnetic patches, 'hat shaped' patches, kevlar/aramide reinforced patches, patches of varying buoyancy and various custom designed solutions to accommodate all kinds of damaged vessels. Miko Marine patches are currently stored onboard more than 1,000 ships, including, most notably, those operated by the French Navy.

- **Fast oil recovery systems (FOR systems)** – once installed, FOR systems offer an easy, quick and risk-free means of evacuating the pollutants present in vessel tanks and bunkers. They enable the standardisation of salvage operations and can halve the time required to organise and complete the pumping of pollutants to safe storage. According to JLMD of France, some 20,000 large capacity ships currently sail the seas without having any emergency access to the hazardous products they are carrying. As a result, the company has developed a FOR system that provides permanent access to a vessel's cargo and bunker tanks. The simple system is supported by the Centre of Documentation, Research and Experimentation on Accidental Water Pollution (CEDRE). According to a recent CEDRE study, FOR systems would have increased by at least 50% the speed of salvage operations on the five most recent major maritime oil spill incidents (*Erika*, *Prestige*, *Levoli Sun*, *Peter Sif* and *Selendangayu*). Certified on January 2010 by Bureau Veritas, JLMD's FOR systems have already been installed on 36 ships.

In addition to the solutions outlined above, a number of complementary technical services have also been developed, such as the SOR (submersible oil recovery) pump, reportedly the first ever portable, hose-free submersible pump specially dedicated to FOR systems. Capable of removing 1.1 tonnes of fuel per minute, it was launched to the market in March 2011 by Dutch company Van Heck. The combination of the SOR pump and FOR systems provides emergency responders with a fast, easy and extremely high-performance means of removing any pollutants from vessel storage tanks.

Crisis management preparation is also key to the development of maritime passive safety. Leading maritime salvage

operator Svitzer is among the first of the shipping sector players to invest in maritime passive safety. Aware of the need to standardise salvage operations and prepare both ships and crews for accidents, the company has already included maritime passive safety solutions at the core of its emergency response plans. It is hoped that by standardising salvage operations, Svitzer will be able to minimise response times and dramatically improve salvage performance.

Polar focus

With the shipping sector looking to trade in ever more environmentally sensitive areas such as the Arctic, it is essential that regulatory bodies such as the International Maritime Organisation (IMO) develop rigorous guidelines regarding the protection of the marine environment in the event of an accident.

At a recent (21 March 2011) meeting at the IMO's headquarters in London, its Ship Design & Equipment Sub-committee learnt more about the concept of maritime passive safety. The French delegation had called for ships circulating in the polar zones to be 'provided with standardised equipment onboard to facilitate recovery of the oils or liquid pollutants contained in the tanks in order to prevent pollutant discharge from a ship damaged in an accident and facilitate recovery of the content of tanks following an accident' and had invited MPSA President Gilles Longuève to outline how maritime passive safety equipment is able to take up the three challenges that ships have to face in the case of emergency:

Prevent or stop pollutants from leaking within the ship and from the ship into the sea.

Access the pollutants, which are often very difficult to reach, as they need to be removed in order to avoid more spillage.

Minimise response time in order to avoid an environmental catastrophe.

The audience provided much positive feedback, with particular interest in the concept shown by the IMO delegations of Denmark, Norway and South Africa, as well as representatives of the CESA (Community of European Shipyards' Association) and WWF (World Wildlife Fund).

The IMO Ship Design & Equipment Sub-committee has since commenced discussions regarding the development of legislation to cover shipping in the Polar region. A first draft is expected soon, which will then be strengthened and specified in the coming months. ●



Diver attaching a patch to a hull

Source: Miko Marine/MPSA