02 Aug 2007

Dutch project prevents *Prestige*-like pollution

The process of recovering oil from sunken vessels is a difficult and demanding process. *Solutions* looks at new methods designed to make it easier

High-profile incidents such as the Prestige have heightened the need for means to remove fuel oil from casualties. Among the latest such projects is the Double Inverted Funnel for the Intervention of Shipwrecks (DIFIS), a multinational effort funded by the European Commission.

Led by Maritime Research Institute Netherlands (MARIN), in Wageningen, DIFIS is aimed at developing a flexible, inexpensive way to remove fuel oil from wrecks – even where the wreck is sitting in deep water.

As Hans Cozijn, MARIN's senior project manager offshore, explained, the project was launched in September 2005 and is scheduled to be completed in September 2008. Of DIFIS's €3.1M total budget, the European Commission is contributing €1.8M. Eight organisations are taking part in the project, including companies and research institutes in the Netherlands, France, Spain, Belgium and Greece.

Casualties such as Prestige showed there is a real lack of tools, systems and methodologies of a type that could be used to intervene to prevent pollution from a casualty, Cozijn said.

DIFIS participants are working on what they call a "reference method" for the prompt and cost-effective removal of fuel oil from wrecks. "The system developed should be able to deal with oil leaking from wrecks even in very deep water," Cozijn explained, noting that the proposed method will be applicable so as long as the oil's density is less than that of seawater.

"The DIFIS system will be a light and quickly deployable flexible structure that will remain in place until all of the tanks on a wreck have been emptied and the pollution threat eliminated," Cozijn continued. "Above all, compared to conventional methods the system is designed to be cheap and flexible."

The main elements of the DIFIS system are a dome, a riser tube and a 'buffer bell'. Fuel leaking from a wreck is captured by the dome and flows up towards the surface through the riser tube. The fuel-water mixture is collected in the buffer bell, which is located 30–50m below the surface, where it will not be affected by bad weather. The buffer bell is connected to standard offshore loading equipment.

"With a concept such as DIFIS deployed, oil pollution cannot spread and will not reach the surface, where recovery could be affected by the weather conditions," Cozijn said. "Instead, a shuttle tanker is used to periodically offload collected fuel oil and transport it ashore."

The participants in the DIFIS consortium each have a specific area of expertise. MARIN is acting as project co-ordinator, and the others include SENER (Spain), IFREMER (France), CEA (France), Cybernetix (France), Sirehna (France), ISI (Greece) and Consultrans (Spain). Also, the European Commission's Joint Research Centre (JRC) is involved as scientific and technical adviser to the DIFIS project. The JRC's Dr Fivos Andritsos had the original idea for the concept and was the originator of the DIFIS project.

"The envisaged solution relies on gravity to channel spilt fuel towards the surface," Cozijn explained. "This is achieved by means of a light, quickly deployable flexible structure. Leaking fuel is collected by a kind of inverted funnel, consisting of a fabric dome solidly anchored around and covering a wreck. The fuel collected is channelled, along with seawater, through the flexible riser tube (typically, this would be 1.5–2m in diameter) into a second inverted funnel (the buffer bell) close to the surface. This second inverted funnel acts like a separator and reservoir. It also keeps the riser line in tension, and provides for rapid periodical unloading."

At present, MARIN is carrying out model tests in one of its test basins to investigate the concept's feasibility. The system's behaviour is being tested at model scale in a variety of winds, waves and currents, and in adverse weather conditions.

Preliminary designs for DIFIS have been completed and in the remaining time available the participants in the project will further develop

procedures for the installation and inspection of the system and examine its economic and logistical aspects. In October, MARIN plans to carry out a second series of model tests, more closely investigating the installation of the system.

Fast recovery from bunkers

DIFIS is far from being the only technology being developed to contain fuel oil in casualties. In France, JLMD Ecologic Group is working on a new version of its award-winning Fast Oil Recovery (FOR) system for fuel oil in bunker tanks. It has already secured orders to fit a similar system, originally developed to remove crude oil from the cargo tanks of oil tankers, on a total of seven vessels.

In the FOR system, pre-installed equipment allows quick, safe access to tanks so that potential pollutants can be removed. Seawater is injected into the tank and pushes oil to the highest part of the tank for recovery. Oil is recovered through a simple connector that is claimed to be fail-safe and easy to maintain.

Fitting the system is straightforward, and can be undertaken on a newbuild or during dry-docking for scheduled maintenance. JLMD says that average investment in a FOR system is less than 1% of vessel cost.

The concept has recently secured the support of the UK P&I Club, Norwegian P&I club Skuld and the Swedish Club. “Because such technologies can cut the time needed for oil recovery operations on a ship in distress in half, P&Is wish to inform their members of the relevancy of these new solutions offered in order to mitigate the impacts of an incident at sea,” said Jerome Bouston, who is responsible for sales and marketing at JLMD.

After an incident to a tanker that has the JLMD system preinstalled, oil trapped in the wreck can be recovered quickly, thereby limiting oil leaks and spills. In this case, the salvage company can begin removing the oil immediately without having to waste time drilling the hull and mounting valves. Once the flexible extraction hose is connected to the system, the recovery can start straight away.

JLMD recently released a presentation detailing a study to determine exactly how much time and money would have been saved on seven past incidents, had the ships in question been equipped with FOR systems.

The study looked at the incidents involving Prestige, Erika, Levoli Sun, Tricolor, Peter Sif, Selendang Ayu and Exxon Valdez, and found that an average time saving of 25% and an average financial saving of $7.5M could be made.

Bouston told Solutions that since the end of 2006 the company and its partners have been adapting the FOR technique for use on bunker tanks, not just cargo tanks, and is working closely with owners of container ships and shipyards about fitting the system.

“The version of FOR intended for ships’ bunkers has yet to be approved by class, but Hyundai Heavy Industries has validated the system,” Bouston told Solutions. He added that JLMD is talking to Louis Dreyfus about the applicability of a bunker solution for use on bulk carriers and to Broström Tankers in Sweden about further applications of the FOR. The technology was presented to the IMO at MEPC 56 in London in early July, Bouston said.

Return to Search Page