

Update

Solutions and Newbuildings - Magazine

01 May 2008

Next step for oil recovery system

A passive, gravity-driven system that avoids costly operations at depth and can operate in rough weather conditions is set for further testing

AFTER a promising series of initial hydrodynamic tests, further tests on the Double Inverted Funnel for the Intervention of Shipwrecks (DIFIS) are to be undertaken later this year.

Reviewed in the August 2007 issue of Solutions, the system is designed as a light and easy to deploy method of recovering oil from wrecks. Its flexible structure would, in the first instance, contain potential pollution within a vessel and seal it, and then remain in place until all the tanks on a vessel had been emptied and the threat of pollution eliminated.

Led by the Maritime Research Institute Netherlands (MARIN) in Wageningen, the Netherlands, the DIFIS project got under way in September 2005 and is scheduled to be completed later this year.

Having finalised the preliminary design, the consortium moved on to consider the detailed design of key elements of the system, such as the dome, buffer bell and riser tube. Scale model tests were successfully completed at MARIN last year.

The consortium has also identified the potential cost of a DIFIS-type oil recovery system, which, it believes, would be in the order of several million euros for a relatively 'easy' intervention rising to several tens of millions of euros for a very difficult oil recovery operation, such as that carried out on Prestige.

As Fivos Andritsos and colleagues from the University of Patros in Greece explained, this could result in an upper limit of the cost per tonne of oil retrieved of around €1,000 for a case similar to Prestige. Expensive as this may seem, the Greek contingent pointed out that in the event of an incident such as Prestige the cost can be very much higher if oil recovery operations are not successful.

The consortium accepts that the cost of developing a DIFIS-like solution on a 'just in case' basis might seem prohibitively high. It notes, however, that after the large number of high-profile incidents involving pollution from shipping recently, there is intense pressure from authorities – local, national and at EU level – to be able to react quickly.

It also notes that post-incident recovery operations carried out under the glare of the media and intense public scrutiny have, all too often, been carried out only after pollution has begun to be released from a wreck and have not always been wholly successful.

Apart from cost, another challenge is the deployment of the system, which could require the use of quite a large vessel, particularly for a more challenging oil recovery operation in deep water.

Regular monitoring not required

Set against this is the fact that in the DIFIS concept, unlike other techniques that have been employed, the maximum number of tasks are undertaken directly from the vessel deploying the system. This avoids costly and time-consuming operations at depth by expensive equipment such as ROVs.

The DIFIS concept is relatively simple. It relies on gravity to channel the flow of spilt fuel towards, but not to, the surface. The fuel-water mix is directed to a buffer reservoir/separator some 30–50m below the surface (being under water, the buffer reservoir is not affected by rough

weather). After collection, the oil held in the buffer reservoir is removed by a shuttle tanker or similar vessel.

The riser tube has a modular design, which adds operational flexibility and reduces cost, and the system is entirely passive. The flow of recovered oil is gravity-driven, although, if necessary, it could be enhanced by other means – such as using a heat source or by injecting chemicals at the top of the dome.

Once in place, DIFIS does not require regular deepsea operations or monitoring, and the presence of a submerged terminal buoy and a high-capacity buffer reservoir ensures that the equipment can tolerate rough weather on the surface.

DIFIS benefits

- simplicity of concept

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once installed, no valves or any specialised equipment is needed

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no moving parts

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no external power required

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deployment poses no risk to the structural integrity of a wreck

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speed of deployment

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Printed from: <http://www.solutionsmagazine.co.uk/secure/demodisplay.aspx?articlename=soup20080501027up&phrase=difis> on 23

September 2008

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