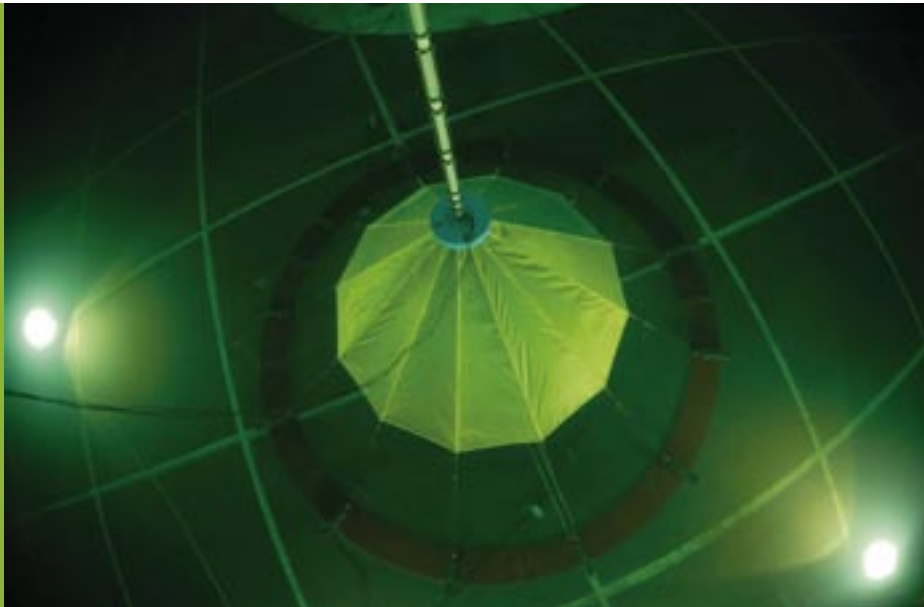


DIFIS

Double Inverted Funnel for the Intervention on Ship wrecks



Background

Maritime disasters leading to major environmental pollution occur regularly every few years. Examples are AMOCO-CADIZ in 1978, TANIO in 1980, AEGEAN SEA in 1992, ERIKA in 1999 and PRESTIGE in 2002.

The PRESTIGE case has shown that a lack of tools, systems and methodologies exists for the prompt intervention on ship wrecks, necessary to confine the pollution and eliminate the source of the pollution threat.

Project scope

The scope of the European research project DIFIS is the study, design and validation of an EU reference method for the prompt and cost-effective intervention on ship wrecks. The developed system should be able to deal with oil leaking from wrecks even in very large water depths. The proposed method will be of general applicability as long the trapped pollutant does not dissolve and is of lower density than sea water.

The DIFIS system

The DIFIS system will be a light and quickly deployable flexible structure that should stay in place until all the tanks of the wreck are emptied and the pollution threat is eliminated. Compared to conventional methods the system is designed to be cheap and flexible.

The main items in the DIFIS system are the dome, the riser tube and the buffer bell. Fuel leaking from the wreck is captured in 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 30-50 m below the sea surface, where it is not affected by rough weather. The buffer bell is provided with standard offshore loading equipment.

With the DIFIS system spreading of the pollutants in the sea is prevented and neither will they reach the sea surface, where their recovery could be affected by the weather conditions. Instead, a shuttle tanker is used for periodical offloading of the collected fuel and transport to shore.

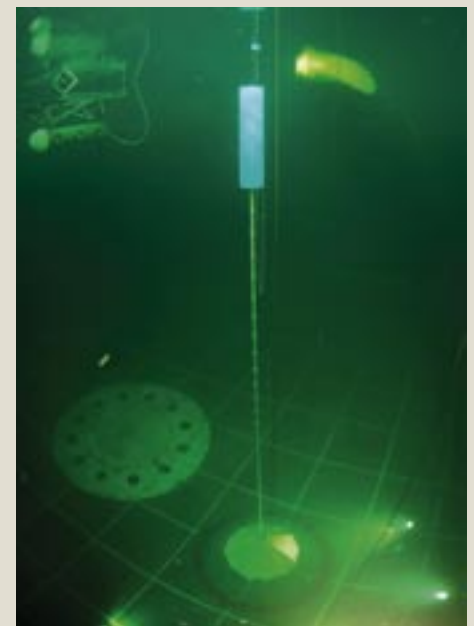
Project approach

The project is carried out by a consortium of 8 participants, each with their own field of expertise. The Maritime Research Institute Netherlands (MARIN) is the project coordinator. The participants are :

- MARIN (Netherlands)
- SENER (Spain)
- IFREMER (France)
- C.E.A. (France)
- Cybernetix (France)
- Sirehna (France)
- I.S.I. (Greece)
- Consultrans (Spain)

The total budget is 3.2 M€, of which 1.8 M€ is funded by the EC. The scope of work includes numerical simulations, hydrodynamic scale model tests and deployment simulations, as well as an analysis of the system costs and planning.

Besides the above participants, the European Commission's JRC (Joint Research Centre) is involved as a





scientific and technical advisor to the DIFIS project. In this respect Dr. Fivos Andritsos of JRC should be mentioned, since he had the original idea for the system concept and was the originator of the DIFIS project.



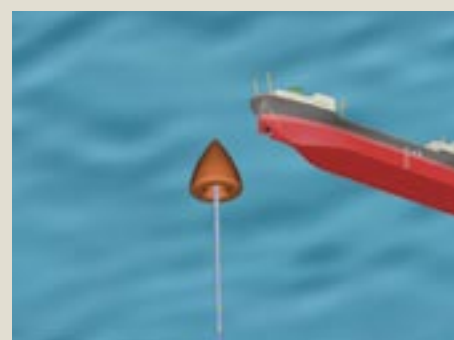
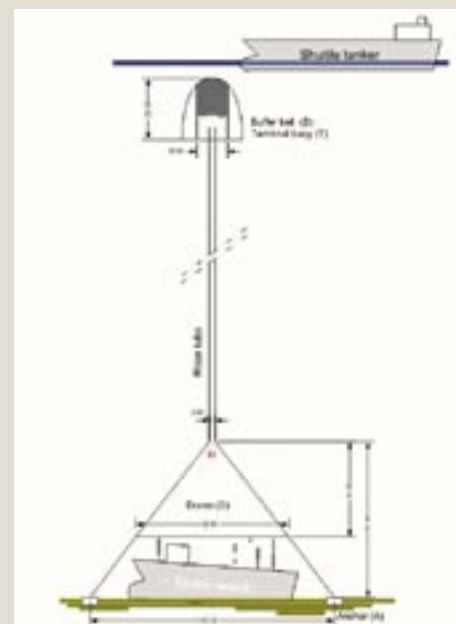
Schedule

The DIFIS project had its kick-off in September 2005 and has a total duration of 3 years. The total budget is €3.1 m, €1.8 m of which is financed by the European Commission.

In February and March 2007, MARIN has carried out hydrodynamic scale model tests to investigate the feasibility of this newly developed system. The system's behaviour was tested at model scale in various weather conditions (wind, waves and current), also including heavy storm conditions.

The first preliminary designs of the system are ready. The results of the model tests carried out at MARIN will be implemented in the DIFIS system final

design. In the next 18 months the DIFIS project will further develop procedures for the installation and inspection of the system. Furthermore, economical and logistic aspects will be taken into account. In October 2007 a second series of



model tests is planned at MARIN, more closely investigating the installation of the system.

DIFIS key figures

The key figures of the DIFIS project are listed below.

- EU research project in FP6 (6th Framework Programme)
- Total budget 3.2 M€
- Total EC funding 1.8 M€
- 8 participants, from 4 different European countries
- Duration 36 months

Contact

More information can be found at <http://www.difis.eu>, or contact :

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