

DIFIS - Double Inverted Funnel for the Intervention on Ship wrecks

Ir. Hans Cozijn¹, Fivos Andritsos², Jean-François Drogou³, Jean-Pierre Lévêque³, Peter Davies³, Douwe Hoomstra⁴, Sergi Ametller Malfaz⁴, Alfredo Arnedo Pena⁴, Victor Morell Cerda⁴, LLuis Candini Gonzales⁴, Christophe Montandon⁵, Alain Fidani⁶, Marc Delauze⁶, Fabian Pecot⁷, Yves-Marie Lefebvre,⁷ Dr. Vassilis Kostopoulos⁸, Panagiotis A. Konstantinopoulos⁸, Dr. Kostantinos Charatsis⁸, Christos Derdas⁸, Dimitrios Mazarakos⁸, Pol Mac an Mhaoir⁹, Victor Estrada⁹

Maritime disasters leading to major environmental pollution occur regularly every few years. The PRESTIGE case, in 2002, has shown that a lack of tools, systems and methodologies exists for prompt intervention on ship wrecks.

The scope of the European research project DIFIS is the study, design and validation of a method for prompt and cost-effective intervention on ship wrecks. The proposed system will be a light and quickly deployable flexible structure that should stay in place over the wreck until all the tanks are emptied and the pollution threat is eliminated. The concept concerns a passive system, which is completely under water and can be applied in water depths as large as 4,000 m. 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. A shuttle tanker is used for periodical offloading of the collected fuel and transport to shore.

The project is carried out by a consortium of 8 participants. The Maritime Research Institute Netherlands is the project coordinator. The European Commission's JRC is involved as a scientific and technical advisor to the DIFIS project.

The DIFIS project began in September 2005 and has a total duration of 3 years. The scope of work includes design, numerical simulations, hydrodynamic scale model tests, deployment simulations, analysis of the system costs and planning.

A first preliminary design of the system was achieved at beginning of 2007. The first series of hydrodynamic scale model tests was carried out at MARIN's Offshore Basin, in order to investigate the system's behaviour in various weather conditions. The results of the model tests will be implemented in the DIFIS system final design. Then DIFIS project will further develop procedures for the installation and inspection of the system, with a second series of model tests. Furthermore, economical and logistic aspects will be studied.

1: Maritime Research Institute (Netherlands)

2: Joint Research Center (Italy)

3: IFREMER (France)

4: SENER Ingeniera y Systemas S.A. (Spain)

5: Commissariat à l'Energie Atomique (France)

6: Cybernetix SA (France)

7: Sirehna (France)

8: Industrial Systems Institute (Greece)

9: Consultrans S.A. (Belgium)