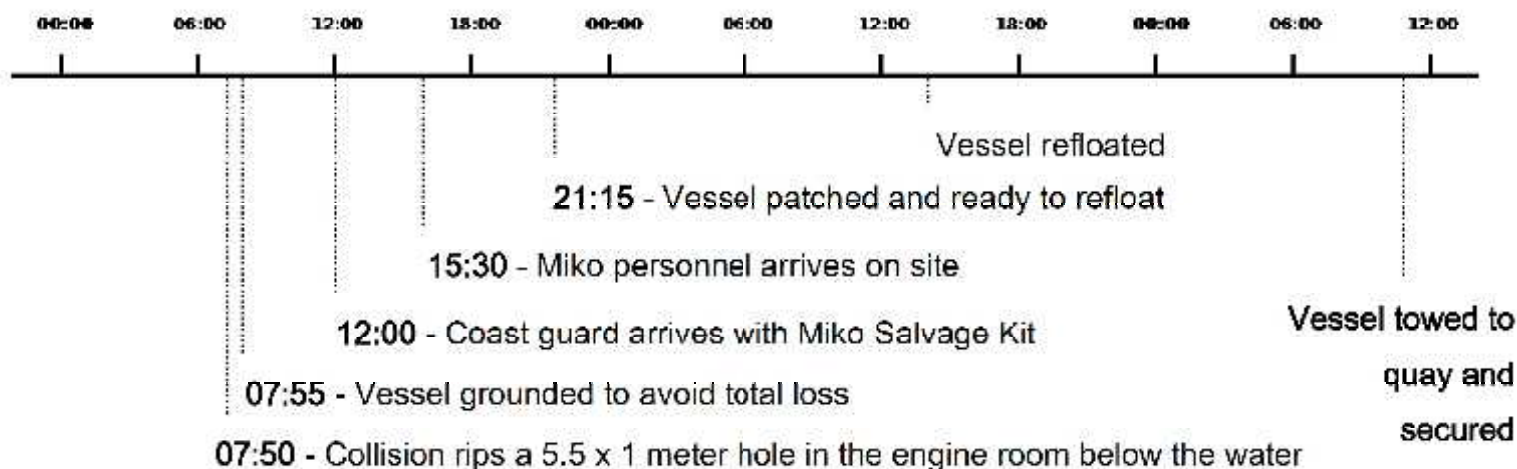


Case:

MS HUNDVÅKØY COLLISION

FINNSNES, 13.03.2010



**Problem
definition**



**Creative
thinking**



Engineering



Planning



Trials

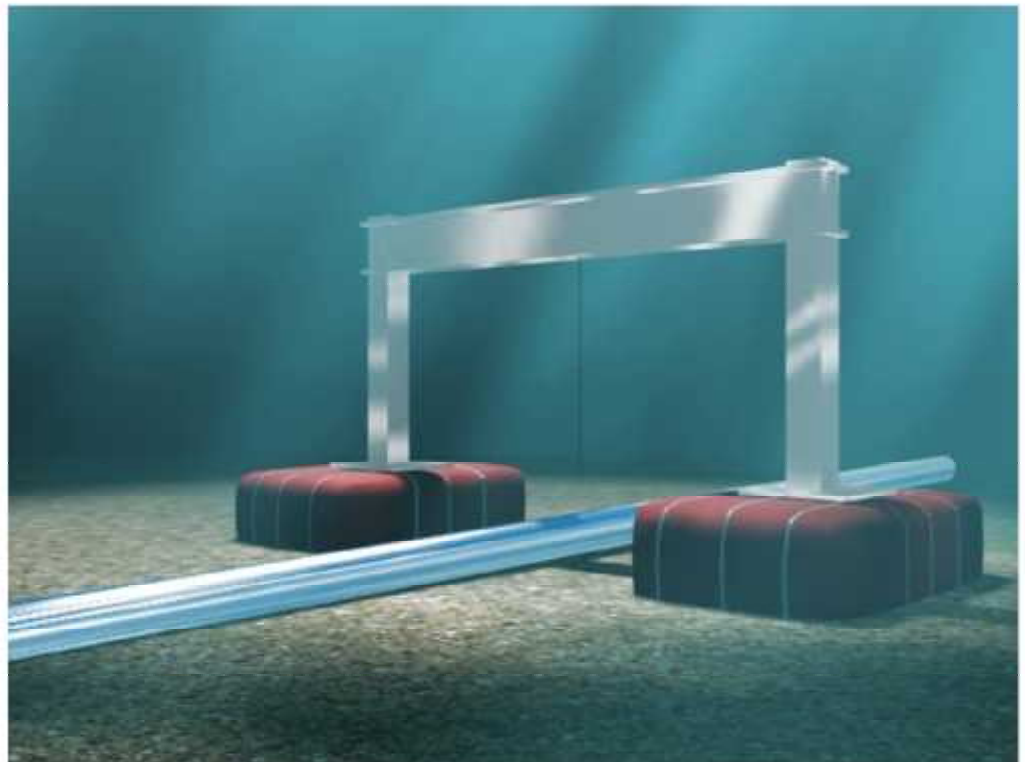


Verification

Introduction

Miko Marine was founded in 1996 based on the idea of using a magnetic patch to stop water ingress and oil spill. Miko Plaster solutions have since been supplied to more than 1000 clients.

Working with marine salvage, in water repair, wreck removal, oilspill prevention and underwater operations Miko Marine has the goal of saving costs through creative engineering.



Cost savings through creative engineering!

The stories that defines us



In the 1990s the Miko group recycled the Statfjord A loading buoy by removing 4000T of iron ore ballast and recycling both the ballast and the structure itself.

The hole had to be re-welded to prevent water ingress as the Miko Plaster® was not available at the time.

For the performance of planned maintenance, Miko Marine developed an ROV applied magnetic patch for closing sea chests on the Åsgard B semi submersible.



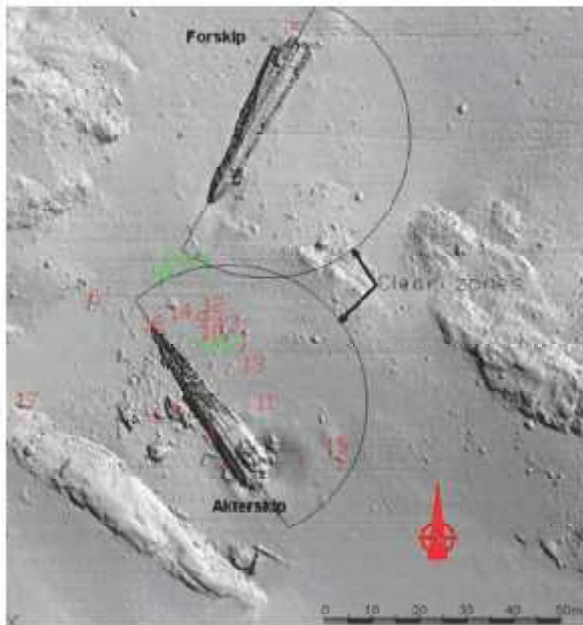
The Highland Faith grounded in New York harbor with 70.000 ton of gasoline on board. Miko Marine was awarded the contract of patching the holes on Christmas Eve and on 28 December Miko Marine was on site with two specially made patches of 25x1.5m and 5x1.5m which allowed the vessel to be patched and sail to repair yard.

The nuclear waste carrier Puma, on its return voyage along the Norwegian coast had an uncontrollable leak in its engine room. The coast guard applied a Miko Plaster and the vessel was able to sail to Hammerfest for permanent repairs.



U-864

At the end of WWII the nazis replaced the steel ballast of a submarine with mercury destined for Japanese weapons production. The submarine used was U864, which was torpedoed and sank off the coast of Norway.



In 2003 the wreck was discovered by the Royal Norwegian Navy. After several investigations and reports it was decided to bury the wreck in sand and gravel. This solution was not accepted by the Norwegian parliament. A competition was organised to find a solution and Miko Marine was awarded a study suggesting to remove the mercury only.

Using a tripod at the end of each of the two wreck parts Miko Marine's suggestion was to jack the central keel out of the mudline using a crawler ROV to remove the mercury. Using specially designed baskets and protective patches beneath the wreck the risk of pollution could be minimised.



After much deliberation the Norwegian Coastal Administration has (2011) for the third time made its recommendation to the government. This time, Miko's proposed solution, removing the mercury and not the wreck, is ranked second, after covering it but ahead of a complete wreck removal.

Miko Plaster® technology

Miko's drive for constant product improvement has lead to the development of Miko-Plasters in various sizes and shapes both magnetic and non-magnetic.

Primarily they are used for:

- Salvage & Wreck Removal
- In-Water-Repair
- Emergency Response

Miko Marine has also developed a unique series of immensely strong (like a 3kg magnet with holding force of 450kg) anchor magnets suitable for a wide variety of underwater operations.

Salvage Kit

Groundings and collisions



Tanker Kit

In Water Repair



ERB

Emergency Response Bag



Miko Magnets



ShipArrestor

A drifting tanker represents a nightmare scenario, the ship, often abandoned, will roll violently, it is difficult to connect a towline to it and time is running out to avert a disaster.

Miko's solution is the ShipArrestor, a novel tool whereby:

1. A ring containing a steel lasso is flown out by helicopter
2. The ring is positioned around a strong point on the tanker using longline technology
3. The helicopter lowers itself over the shipside and drops the sea anchor
4. The sea anchor self inflates due to the relative flow of water
5. The tanker's bow is rotated up against the wind reducing the drift by around 50% and minimises the roll motion
6. With the use of a pick-up buoy a towing connection is immediately available for the first arriving tug



Roll: 25 Hdn: 302 Date: 09
Pitch: -25 Clk: 13:4
Dpt: 14.5m



Drivanker test H vaag



Concept development

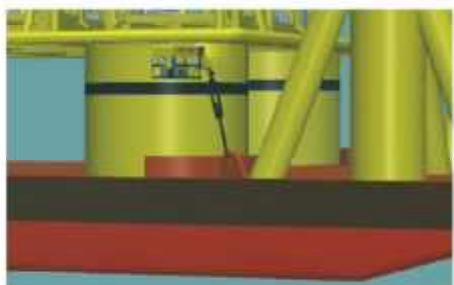
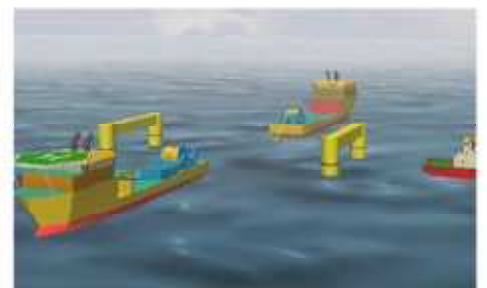
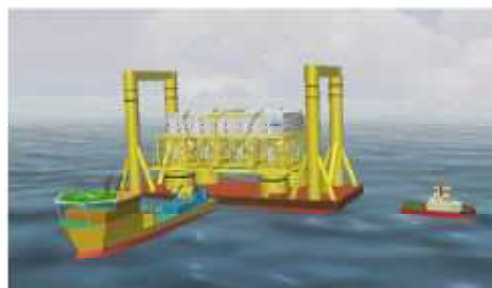
Integrated Remote Closure of Seachest (IRCS)

By permanently installing remotely operated blanking plates the sea chests can be closed for maintenance and repair avoiding expensive drydockings or hazardous diving operations.



Computer Controlled Lifting System (CCLS)

Miko Marine has designed and trial tested controlled air buoyancy to install and remove subsea modules. The technology is protected by a functional patent.





MARINE AS

- Creative solutions delivered



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