

## UMC International Plc

*In water maintenance and through life waterborne support*

JANUARY 2008

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### **AFLOAT REPAIRS FOR NORTH SEA OIL RIG**

**UMC International plc recently designed, manufactured and installed a unique cofferdam system that allowed the afloat repair of all three spudcans of a jack up oilrig.**

The challenge was to create a dry working environment around the giant support feet (known as spudcans) of a jack up oil rig so that repairs could be undertaken on the top surfaces of each foot. The cofferdam system had to completely enclose each of the spudcans in turn, and seal against the underside of the rig hull, when in position the area around and above the spudcan would be drained down thus allowing surface workers to carry out the Class approved weld repairs that were required. All the work was carried out in the port of Esbjerg, Denmark with only ten metres of water available, and water visibility of less than 30cms.

The design of the cofferdam consisted of a bolted hexagonal steel ring with integrated ballast tanks, and a flexible membrane that covered the underside of the spudcan and sealed around the steel ring. The benefits of this design over an all steel construction were the reduced manufacturing costs, reduced clearance required for installation, and reduced overall weight.

In addition to the main cofferdam system providing a watertight seal around the spudcan, a series of inflatable seals were also placed between the inside of the steel ring and the outside of the spudcan, this provided a secondary sealing system, further reducing the risk of leakage.

The complete cofferdam system measured 16m across, 2m deep and weighed 35 tonnes.

Once manufactured and trial assembled in the UK, the entire assembly was disassembled, transported to Denmark and reassembled prior to arrival of the rig. Once the rig had berthed, the complete cofferdam assembly was then lowered into the water and using airlift bags transferred to the rig, where it was submerged by adjusting the built-in buoyancy tanks and flected under the rig using a series of chainblocks.

Once in position over the spudcan and up against the hull, air was fed into the ballast tanks and the resultant upthrust forced the cofferdam against the hull compressing the main seal that interacted with the rig and cofferdam, sealing the entire system to the environment outside.

A series of pumps were installed into the leg well from the upper deck of the rig to extract the water, when fully drained and the complete cofferdam system fully secured to the rig the surface workers could safely access the top of the spudcan and carry out the desired NDT and welding in a dry and safe environment.

The entire operation on the three spudcans was successfully completed in six weeks and provided a cost-effective and practical alternative to docking. The principles used for this repair can equally be used for similar repairs for other rig spudcans.

UMC International provides specialist design, evaluation and consultancy services to ship owners and subsea structures.

**The diagram caption: A section through the oilrig with the spudcan raised and the cofferdam in position.**

**The pictures caption: Cofferdam assembly being lowered into the water.**

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**PHOTOS: Please go to the PRESS page on our Website: [www.umc.co.uk](http://www.umc.co.uk) to view the photographs and then contact the UMC Media Desk as set out below for receipt of high-resolution jpg's.**

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