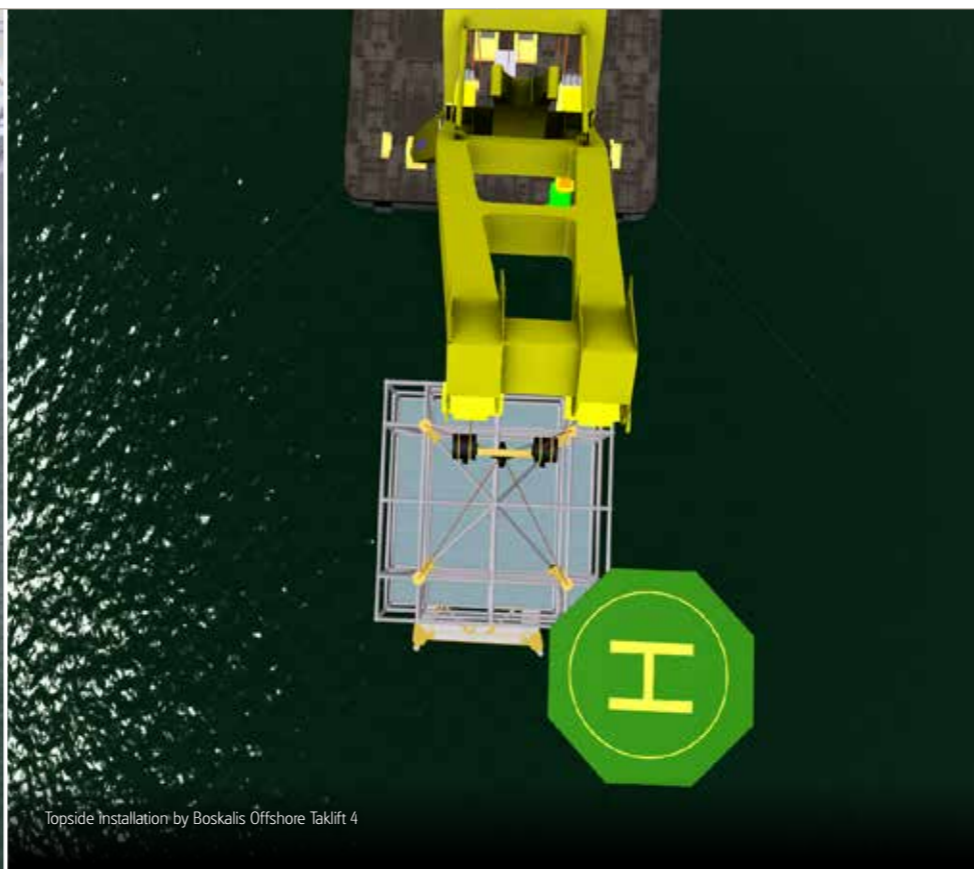




Float-over topside by Heerema H851



Topside Installation by Boskalis Offshore Taklift 4



Heavy Lift Vessel Oleg Strashnov jacket upending



OBELICS successfully concludes after two years

The OBELICS JIP results in the development of an engineering and operation simulator suitable for both designing and training purposes.

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Given the growth of the offshore Oil & Gas and renewables market and the need to provide valuable training tools and to improve existing technology, the launch of the OBELICS Joint Industry Project (JIP) came just at the right time.

Existing time domain simulation technology already addresses multi-vessel simulation in a dynamic wind-wave-current environment, allowing various interactions by human operators but the capability that was missing to make the step to offshore operations was proper heavy lifting and ballasting. The JIP is an initiative from the following participants: Statoil, BigLift, Heerema Marine Contractors, Hydrographic and Marine Consultants, Jumbo, MARIN, Seaway Heavy Lifting (SHL), Boskalis Offshore, Scaldis and TreeC.

In April 2011, OBELICS started the challenging journey towards developing heavy lift and ballast operation simulation. The main objective of the two-year JIP was to develop simulation software for ballast and

lift operations of extreme loads, incorporating all the relevant dynamics of an offshore environment. This software is integrated and visualised in a real time environment to verify and/or practice these types of offshore operations. Additionally, the JIP aimed to close the gap between operations and engineering, to secure the knowledge base and to enlarge the problem solving capability on the engineering side.

By adding newly developed Ballast & Lifting functionality to the existing simulation framework, OBELICS is capable of simulating offshore heavy lift and ballast operations interactively, both for engineering and for training purposes.

Full Mission Simulators As part of the JIP, simulations were conducted utilising three Full Mission Simulators (FMS) connected interactively, while simultaneously manned by a superintendent, a ballast operator, one or sometimes two crane operators and an ROV operator.

In November 2012, the programme culminated in a three-day workshop on MARIN's Full Mission Simulators whereby the newly developed technology was demonstrated with realistic cases of heavy lifting and ballasting operations and evaluated in a number of scenarios. The simulations demonstrated how OBELICS can be applied in a research and training environment.

Buoy installation with Happy Sky Two simulation runs were executed with the Heavy Lift Vessel Happy Sky from BigLift. The vessel is equipped with two, 900-tonne cranes and a ballast system.

The first simulation involved the vessel moored alongside the berth with the task to perform a tandem loading operation of a 1,000-tonne offshore STP buoy from the quay onto the deck in a preinstalled grillage. In a second run the buoy was lifted from the deck of the Happy Sky onto a barge, which is moored alongside. In this scenario beam and head waves were varied.

Jacket upending with HLV Oleg Strashnov In this scenario the Heavy Lift Vessel Oleg Strashnov from Seaway Heavy Lifting placed a jacket on the seabed. The scenario started with the jacket almost horizontal in the main hoist of the crane, with the ship held in position by anchors.

The crane's main hoist lowers the jacket in the water with the jacket inclined to a small angle. During this phase the ballast system is used to control the position of the ship when the buoyancy of the jacket increases. When the jacket is largely submerged it is upended to a vertical position using both the main hoist and the auxiliary hoist. Finally it is placed onto the seabed.

The operation was executed both in calm conditions and in waves by the same captain who was present during the real execution of this installation in early 2011.

1,000-tonne buoy installed using HLV Jumbo Javelin In another simulation case a buoy was installed using the

heavy lift transport ship Jumbo Javelin. This vessel is equipped with two 900-tonne mast cranes. The case resembled the BigLift case and two simulation runs were executed. In the first one a 1,000-tonne buoy was picked up from the deck and installed in the sea. The second operation was the same, however now tugger winches were used to stabilise the load.

The OBELICS JIP was certainly successful in developing an engineering and operation simulator suitable for both designing and training purposes. The integrated ballast and lifting modules were demonstrated successfully during complex scenarios.

Although the bridge simulations identified some minor shortcomings, the participants were very enthusiastic about the performance and its potential. ▬