

Reverse engineering



BW Offshore has managed to convert a fixed installation FPSO back into a ship in order for her to sail to a new field under her own steam.

In the summer of 2005, BW Offshore purchased the FPSO BW Endeavour (formerly named Whakaaropai) from Shell Todd Oil Services (STOS) in New Zealand. The vessel was ready for pick up and moored 30 km offshore the south west coast of the North Island. However, as a fixed installation, its

main engine had been immobilized for the past ten years and its navigation and marine equipment removed. It was therefore most likely that the ship would have to be towed out of New Zealand waters. An initial estimate for towing from New Zealand to Singapore by two ocean sailing tugs was USD 10 million.



LEFT The mooring chains are blown off. **RIGHT** Explosives are clamped on to the anchor chains. **BACKGROUND** Captain Atul Chemburker, master of the vessel.

DIFFICULT WORK

Given the expense of towing, it was decided to undertake the on location conversion of the vessel from an FPSO back into a ship. The cost for the upgrade was only a small portion of the towing alternative, and as the work was required to mobilise the FPSO for her next assignment anyway, significant savings could be made. However, the sea and wind conditions on the site were rough (even worse than in the North Sea), so it would be no easy task.

The hull and process topside were in a good condition since the operation was in accordance with Shell's procedures and in an area with protected marine species. However, the main engine had not been run since 1996, the year when the vessel arrived on location. With no intention to operate or maintain the engine, no preservation had been done by STOS and the condition of the engine and the associated auxiliary systems was heavily degenerated. When they arrived on site in October 2005, hard and difficult work awaited the chief engineers Egil Hem and Igor Bistrovs, supported by David Saravanan and his team from Wing Ship Services in Singapore.



TECHNICAL CHALLENGE

The Sulzer 28,000 HP, 9 cylinder, two stroke engine was completely stripped and rebuilt, which provided many challenges due to the size of the components. Each piston and connecting rod weighed five tonnes and had to be lifted out of the block to be overhauled and to provide access to other components. Hundred of meters of piping were fabricated and installed. Auxiliary systems such as purifiers, pumps, exhaust boiler, alarm systems and motor starter panels were overhauled. The rough sea and roll at the exposed offshore location made the work difficult, as all heavy parts had to be secured by ropes and wires during the lifting operations. Supply ship arrivals were rare, which further delayed the work.

The stern tube seals were replaced on-site while maintaining production. The stern tube is the point where the propeller shaft penetrates the hull. It is sealed and oil-filled in order to prevent seawater ingress. The vessel was trimmed so that the propeller came out of the water and scaffolding was built around the propeller for access. Due to the sea conditions, it took three attempts and one month to complete the job. The corresponding time needed in a port or dry dock is two days.

SUCCESSFUL COMPLETION

After the engine had been tested, a number of approvals and audits were required. The ship was first approved by Lloyd's Register and by the Port State Authorities (Maritime NZ), then ISM and



LEFT from left Renga (Wing Ship machinist), Igor (BW Offshore Chief Engineer), David (Wing Ship Foreman) and Larry (STOS).

ISPS audits were conducted by DNV and finally the registration work for the Bermuda register was completed. Then the mooring chains were dramatically severed by the use of explosives clamped on to the chains. The sea trials were successfully completed and witnessed by Lloyd's, and in May 2006,

after bunkering in Auckland, BW Endeavour started its voyage to Singapore.

The success of the operation was thanks to the hard work of her crew, chief engineers Egil Hem and Igor Bistrovs, Captain Atul Chemburker and excellent support from Singapore based

Wing Ship Services and their Foreman David Saravanan. In addition to the team's own efforts, a very helpful, flexible and friendly attitude from the seller, local authorities and suppliers were important factors in this success. ●