Case Study

ALTUS OIL & GAS MOVES THE WORLD'S LARGEST STP BUOY

When BW Offshore needed to move the worlds largest STP Buoy they turned to Altus Oil & Gas for the job.

The Challenge

BW Offshore, working on behalf of Petrobras Americas were tasked with converting an ex-tanker into an FPSO vessel capable of carrying out operations in the ultra-deep waters of the Cascade and Chinook fields, located in the Gulf of Mexico. The oilfield is the deepest that any FPSO has been deployed to, reaching a water depth of 2,690 m (8,877 ft).

Altus Oil & Gas were contracted to load and ship the FPSO topsides, as well as turret and mooring system, for deliveries to Keppel Shipyard in Singapore, and to an offshore site in the Gulf of Mexico. A lot of attention was given to the most complicated transport, which was the STP Buoy & Turret. No small feat considering the weight of the module was 1,200 tons, including the grillage, and measures in at just below 30 meters tall.

There were added complications in sea-fastening given that minimum welding could be done on the cargo due to the need to keep the coating on the buoy intact to ensure its durability at sea during its life-time. The size of the buoy, difficult wharf conditions, rotation requirements, and exposure to rough weather meant there was limited margin for error in landing the buoy on deck. In addition, once on deck there was very little space to install wires for the sea-fastening required during transportation. It was clear that a critical success factor lay in engineering, designing and installing a grillage on the vessel before the loading and voyage took place.

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The Solution

Lifting the buoy and finding the right type of vessel to move it involved expert engineering and planning to cope with its weight, size and the associated risks of maintaining the cargo's centre of gravity during movement across the Pacific Ocean – and through rough sea's.

Altus partnered with the owners of the heavy lift vessel "Beluga Formation" to carry out the operation. The project started in Asia, with the design and installation of a custom-made grillage at Keppel Shipyard working together with the ship owner and BW Offshore. The buoy was then loaded by a sheer leg crane onto the vessel and then chartered for immediate delivery to the mega-offshore construction vessel/rig "Balder" waiting 300km offshore in the US Gulf to lift and hoist the buoy into position.

Teams from Altus and Beluga worked closely together with the customer on engineering the solution with key highlights of the solution design being;

- Ensuring DNV and LOC compliance at every stage of the move.
- Strengthening the deck to carry the weight of the buoy.
- Installing two wings on either side of the vessels bridge to give the crew and captain visibility during sailing due to the size of the buoy blocking their view.

The Outcome

The team's expertise in planning, engineering and implementation ensured the timely and safe delivery of the buoy to its destination. Data from the planning phase meant that the team was able to make a more economical decision to use a relatively conventional heavy-lift vessel with slight adaptations versus a more expensive specialized vessel. This ensured the project was not only successful from an operational perspective but also met the tight budgets for all concerned.

National Geographic sent a crew to film the enormity of the project and document the responsibility being undertaken to ensure the on-time and safe delivery of the buoy for broadcasting on their show 'Megastructures' in 2010.

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