Boskalis

PROJECT SHEET

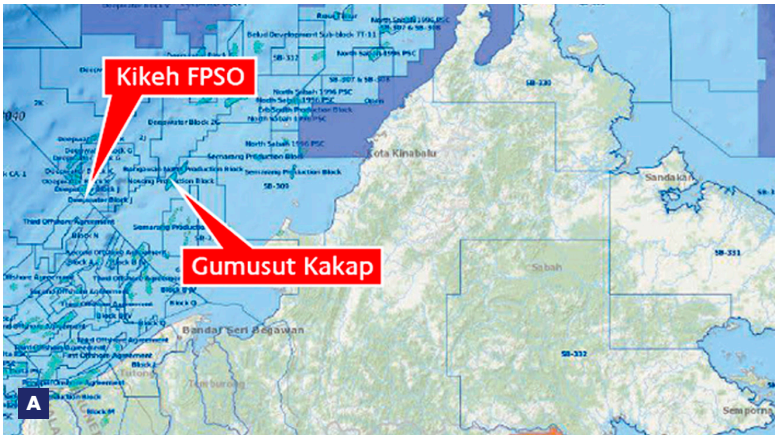
SHELL GUMUSUT KAKAP
LOADOUT OF INTEGRATED FLOATING PRODUCTION SYSTEM (FPS)

BOSKALIS

Royal Boskalis Westminster is a leading global marine contractor and services provider. With safety as our core value, we offer a wide variety of specialist activities to the oil & gas and renewables sectors. These activities include marine installation and decommissioning, seabed intervention, marine transport and services, subsea services and marine survey. In addition, Boskalis is a global dredging contractor, provides towage and terminal services across the globe and delivers marine salvage solutions.
By understanding what drives our clients we are able to provide the solutions that enable them to meet their specific business goals. For this reason we are constantly looking for new ways to broaden and optimize our offering and are committed to expanding our proposition, supported by our financial strength.
With our committed professionals in engineering, project management and operations, 900 specialized vessels and an unprecedented breadth of activities in 90 countries across six continents we help our clients in the offshore industry push boundaries and create new horizons.

FEATURES

Client	Malaysia Marine and Heavy Engineering (MMHE)
Location	MMHE, Johor Bahru, Malaysia
Period	May 2013
Contractor	Boskalis
Vessel	Blue Marlin



INTRODUCTION

Gumusut Kakap is a deepwater oil discovery in offshore Sabah, Malaysia where Sabah Shell Petroleum Company is the designated Operator. This development employs Malaysia's first deepwater semi-submersible production system. The 44,000 t FPS is to be located about 200 km off the shore of Sabah (East Malaysia) in the South China Sea in water depth about 1,200 m. The project has allowed Shell to share deep-water expertise with Malaysian energy companies, assisting in the Malaysian government's goal to create an offshore industry hub. The platform was built in Malaysia by Malaysian Marine and Heavy Engineering Sdn Bhd (MMHE).

Boskalis was awarded a contract by MMHE for the provision of the Heavy Transport Vessel (HTV) for the load-out, float-off and tow-back package of the Project which includes the load-out of the Integrated FPS from MMHE fabrication Yard onto the HTV, Dry-transport to Desaru, Float-off, Tow-back and Re-delivery at MMHE fabrication yard.

PROJECT EXECUTION

Boskalis was responsible for the load-out-, transport- and float-off engineering and execution of the Gumust Kakap FPS. This included the design of HTV grillages, skid beams and seafastening as well as the design, fabrication and delivery of a ground reaction type Buoyance Tank(BT).
The scope also included the mobilization and readiness of HTV Blue Marlin, HTV ballasting during the skidded load-out operation and the provision of the marine spread required for the float-off operation and HTV and BT demobilization.

HTV Blue Marlin arrived at the load-out yard end of March 2013. The fabrication yard started with the installation of the grillage required for the load-out of the FPS. The outfitting of the HTV main deck was completed mid-April.
Since the draft of the FPS, once afloat, would be more than the maximum water

A Location map of Gumusut in East Malaysia/Sabah
B FPS skidded onto Blue Marlin

depth over the HTV main deck, a draft reduction mechanism had to be designed. For this purpose Boskalis had designed and fabricated a Buoyance Tank (BT). This BT was designed to fit between the FPS bottom plating and the top of the HTV grillage. On the BT fabrication yard the BT was loaded onto a charted barge, transported to Pasir Gudang, where it was loaded-in for storage until the FPS was ready for the load-out.
On April 16th 2013 the BT was load-out by SPMT's onto the barge that would be used for positioning the BT between FPS bottom and HTV grillage.
On May 3rd the FPS was skidded to just before the HTV (land-pull) to start the load-out the next day. As a result of the skidding system used, the tolerances were very small, which resulted in a slow skidding speed. The FPS was in its final position in the early morning of May 5th.
Once in position the securing of the FPS started, the link beams were removed and the HTV de-ballasted to BT load-out conditions.
On May 9th the barge with BT were moored against the HTV. The next day the load-out of the BT started and on May 11th the BT was in the correct position. HTV and BT were now prepared and tested for the dry-tow and the subsequent discharge operations.
On May 14th the loaded HTV shifted from Pasir Gudang to the offload location near Desaru where it dropped anchor. Various preparatory work on the FPS and seafastening removal had to be done and on May 21st all was ready for the discharge of the FPS with the BT under it. The FPS and BT were towed off the HTV by 1 AHT and 4 inshore tugs. After this discharge the HTV de-ballasted and shifted back to the yard for main deck reinstatement.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D


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The FPS needed to be offloaded from the BT which started early morning of May 22nd by ballasting of the BT. The FPS was towed off the BT that same afternoon and re-delivered to client.
The BT was de-ballasted and towed back to Pasir Gudang for reinstatement.

PROJECT CHALLENGES

To ensure that the FPS could achieve the required float-off draft, the BT, which is technically a ground reaction barge is required for the discharge operation. Boskalis was responsible for ensuring that the BT was designed, constructed and delivered to ensure the safe and successful execution of this complex discharge.

The BT design was unique, having its own power, sophisticated ballast system, tank gauging system, ballast air compressors, hydraulics etc. which had to be thoroughly examined and dry tested before the operation. Also, ground reaction barge operations require flat hard seabed. Intensive research was carried out including bottom survey of several areas around the coast before suitable location with hard sand at required depths was found off Desaru area.

CONCLUSION

The success of the project was due to the strong cooperation between all parties. The project had schedule challenges but the close working relationship between the project management teams of MMHE and Boskalis ensured that the project was still executed in a safe, operationally sound and timely manner.


F

C Maneuvering of BT towards FPS + BM
D Positioning of the BT
E FPS + BT on-route to Desaru on board the Blue Marlin
F FPS safely floated off

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