

PROJECT SHEET

FPSO TURRITELLA TURRET & MODULES INTEGRATION SINGAPORE

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Under brands such as Boskalis, Dockwise, SMIT, Fairmount, Asian Lift, VBMS and Smit Lamnalco we offer more services than any other company in our industry, making us your next one-stop solution provider.

We support the development, construction, maintenance and decommissioning of oil and gas import and export facilities, fixed and floating exploration and drilling facilities, pipelines and cables, and offshore wind farms

TURRITELLA FPSO PROJECT

The Turritella, which is owned by SBM Offshore and leased to SHELL Offshore Inc., is an FPSO (Floating Production, Storage and Offloading) facility for the Stones development project in the Gulf of Mexico. The Stones development is located in 2,896m (9500ft) of water approximately 320km (200 miles) offshore Louisiana in the Walker Ridge area. When installed, the Stones FPSO will be the deepest FPSO development in the world.

Once completed, the Turritella will start work for Shell at the Stones field in the Gulf of Mexico.



FEATURES

Company	Shell
Location	Keppel Shipyard, Singapore
Period	Lift campaign commenced on 2014 Project ended on 3 July 2015
Contractor	SBM Offshore / Keppel Shipyard
Sub-contractor	Asian Lift Pte Ltd
Lift Weight	Varies from ~100 mt to 3100 mt
Executed work	Lift & Go Operation for Installation and Integration
Equipment deployed	Asian Hercules (1600mt) Asian Hercules II (3200mt) Asian Hercules III (5000mt) Asian Helping Hand III (400mt)



- A** FPSO Turritella
- B** Lift & Go Operation of Module MD03 (541mt)
- C** Installation of Flare Tower (166.7mt)

SHEERLEGS CRANE SERVICES

SBM Offshore has selected Asian Lift Pte Ltd to provide sheerlegs crane services for the lifting and integration of thirteen modules and a hose reel. The project will be executed using the lift and go method, transporting the equipment from various yards in Singapore such as the Dynamac Engineering yard and the Exterran Yard (former BT Engineering yard) to Keppel Shipyard with the Asian Hercules, Asian Hercules II and Asian Helping Hand III.



In a separate contract with Keppel Shipyard for the same project, Keppel has selected Asian Lift Pte Ltd to provide sheerlegs crane services for the lifting and integration of various structures such as the turret and its associated structures - the gantry, crane boom and crane housing, flare tower, helideck etc. The work will be done using the lift and go method, transporting the equipment from Keppel Shipyards (Tuas) and (Benoi) in Singapore to the FPSO, which is currently berthed at Keppel Shipyard (Tuas), with the Asian Hercules, Asian Hercules II and Asian Helping Hand III.

Under another contract with Keppel Shipyard, Keppel selected Asian Lift for the load-out of the ~3100 mt BTM Buoy (Buoyant Turret Mooring) onto one of Dockwise's transportation vessels with the 5000 mt sheerlegs Asian Hercules III.

LIFTING OPERATION

The lift and go operation consists of three stages: lifting, transportation by crane hooks and installation.

During the lifting stage, a floating crane is used to lift the modules/structures at the fabrication yard. These modules/structures are then transported on the crane hooks to the installation yard where the FPSO is located. Finally, these modules/structures will be installed on the FPSO in the designated positions.

The first lifting operation for this project started on March 2014 and the final operation was completed on July 2015. The lifting weights range from 100 mt to 3100 mt.



In general, the sequence for a lifting operation includes:

- Arrival of the floating crane
- Connection of mooring lines
- Connection of riggings to modules/structures
- Commencement of the lifting operation
- Movement of the floating crane from the fabrication yard to the installation yard
- Installation of modules/structures on FPSO
- De-rigging process
- Demobilization of the floating crane.

SAFETY

Several safety features were needed for this operation:

- No working under suspended load at all times
- Hooked up double lanyard (for safety harness) for all work above 2m
- Life jacket to be worn by all personnel onshore and onboard whenever working near water
- Gloves to be worn at all times in operations area
- SHELL 12 lifesaving rules to be followed.

PROJECT CHALLENGES

The main challenges, which were effectively resolved during project preparation and execution were:

- The lifting of Modules MD12 (weight 286 mt – Size 20 m x 5 m x 1.5 m) MD03 (weight 541 mt – Size 16 m x 8.5 m x 12.5 m) and MD04 (weight 541 mt – Size 16 m x 8.5 m x 12.5 m) involved high vertical centers of gravity. There were several discussions and brainstorming sessions with Asian Lift and SBM about preventing the overturning of the modules by installing sling guides and additional pad-eyes to stabilize the safe and successful lifting operation during engineering stages.
- During the lifting of the BTM Buoys, a pad-eye was closed off by the platform and another obstruction. As a result, the designed shackle pin could not be fitted. Asian Lift conducted discussions during the kick-off meeting with SHELL and Keppel shipyard about an alternative design for a modified shackle with a shorter pin length to get round the obstruction.

CONCLUSION

Asian Lift worked closely with SBM, SHELL, the different yards and marine warranty surveyors to provide solutions to engineering and operational challenges for the successful lifting and integration of the FPSO Turritella modules and structures in line with the client's requirements and budget.



- D** Lifting of M1A Buoy (327.3mt)
- E** Installation of Lower Turret Structure (1137mt) during fabrication stage (Trial Fit Process)
- F** Installation of Gantry Box (286mt)

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