

SEMBCORP MARINE SIGNED US\$1 BILLION CONSTRUCTION CONTRACT TO BUILD WORLD'S LARGEST SEMI-SUBMERSIBLE CRANE VESSEL

Sembcorp Marine has entered into an Engineering and Construction contract worth approximately US\$1 billion with Heerema Offshore Services B.V. (HOS) to build a new DP3 semi-submersible crane vessel (NSCV). This follows an earlier exclusive letter-of-intent signed between Sembcorp Marine's wholly owned subsidiary Jurong Shipyard Pte Ltd and Heerema Offshore Services B.V. in March this year for the NSCV.

Heerema Offshore Services B.V. is a subsidiary of Heerema Marine Contractors Nederland Holding SE (HMC), a world leading marine contractor in the international offshore oil and gas industry. HMC excels at transporting, installing

and removing offshore facilities including fixed and floating structures, subsea pipelines and infrastructures in shallow waters, deep and ultra-deep waters. HMC is headquartered in Leiden, the Netherlands.

The NSCV is designed for the installation and decommissioning of major offshore facilities worldwide. It will be equipped with two Huisman heavy-lifting offshore cranes of 10,000 MT lifting capacity each and a large reinforced work deck area. With the vessel length of 220 metres, width of 102 metres and displacement of 273,700 MT, the NSCV will be the largest dual-fuel semi-submersible crane vessel in the world. It is scheduled for delivery in the fourth quarter of 2018.

The NSCV will be built at the Sembcorp Marine Tuas Boulevard Yard, a state-of-the-art yard facility designed to maximise operational synergy and production efficiency. Phase 1 of Tuas Boulevard yard spans 73.3 hectares and is equipped with four VLCC drydocks with a total dock capacity of 1.55 million deadweight tonnes. Phase II spans 34.5 hectares and will include a steel fabrication facility and another three dry docks, including an offshore dock measuring 255 metres by 110 metres where the NSCV will be built.

Heerema Marine Contractors said that the new vessel's two Tub-Mounted Cranes and dual-fuel engines will enable the company to offer installation and decommissioning services and meet its long-term strategy of delivering the best possible services to the industry. The new contract will enable Sembcorp Marine to penetrate into the deep water draft market segment.



The Heerema NSCV will be the largest crane vessel in the world.

KEPPEL SHIPYARD SECURED FPSO AND THREE OTHER CONTRACTS WORTH \$125 MILLION

Keppel Shipyard secured a Floating Production Storage and Offloading (FPSO) conversion contract as well as three repair, upgrade and modification contracts worth a total of about \$125 million in August.

Keppel Shipyard will be undertaking the FPSO conversion project for Armada Madura EPC, a joint venture between long-standing customer Bumi Armada and Shapoorji Pallonji Group. This is Keppel's third conversion and upgrading project for Armada Madura. The first two were *FPSO Armada Sterling* and *FPSO Armada Sterling II*. These FPSOs have been performing at the D1 field and Cluster 7 field in India respectively. This contract is also the yard's 13th conversion and upgrading project for Bumi Armada.

FPSOs continue to be the preferred product for deepwater production. Work on the FPSO conversion has commenced and is scheduled to complete in the third quarter of 2016. Upon completion, the FPSO will produce for the Madura Strait Block BD, located 65km east of Surabaya and about 16km south of Madura Island, Indonesia.

Separately, Keppel Shipyard was awarded major repair, upgrade and modification contracts by Totem Ocean Trailer Express, Dolphin Drilling and Saipem Offshore Norway AS. Dolphin Drilling and Totem Ocean are new customers to the shipyard while Saipem Offshore is a returning customer. Keppel Shipyard was contracted by Totem Ocean for the world's first conversion of a large roll-on/roll-off cargo vessel to operate on a dual-fuel diesel LNG propulsion system. The work comprises a complex undertaking of the replacement of four engines, adding 2,200 cubic metres of LNG capacity along with the addition of 47km of new cabling. When the conversion is completed, the vessel named *Midnight Sun*, will

produce significantly less greenhouse gas and particulate matter emissions.

Keppel Shipyard's work for Dolphin Drilling's drillship, *Belford Dolphin*, will include renewal survey and modification. The project with repeat customer Saipem Offshore will involve major refurbishment and upgrading works such as the installation of a new 750-tonne Abandon & Recovery winch and additional thruster, as well as a living quarters extension for a Field Development Ship.

Keppel Shipyard said that despite headwinds faced by the industry due to the current low oil prices, it has been receiving active enquiries especially in the areas of repair works and LNG solutions. The shipyard's track record in LNG include extensive experience in LNG carrier repairs and Floating Storage Regasification Unit conversions.



Keppel Shipyard has completed two conversion and upgrading projects for Armada Madura EPC, the last completed project being FPSO Armada Sterling II (pictured) which is now operating in the Cluster 7 field in India.

KEPPEL FELS CLINCHED SECOND LIFTBOAT ORDER AT US\$85M

Keppel FELS Limited, a wholly owned subsidiary of Keppel Offshore & Marine Ltd (Keppel O&M) has secured a contract from Crystal Heights Holdings Limited to build a high specification liftboat. The contract from Crystal Heights, a company specialising in the offshore oil and gas market in Asia is worth US\$85 million.

The liftboat is designed by Keppel O&M's liftboat design specialist, Bennett Offshore, in collaboration with Keppel FELS. Scheduled for delivery in fourth quarter of 2017, the liftboat will have provisions enabling it to operate in China, the Middle East and the Gulf of Mexico.

Liftboats are dedicated vessels used to support offshore platforms in construction, accommodation and well intervention as well as maintenance and installation. Keppel has leveraged its jack-up rig technologies and expertise to develop its own series of liftboat designs. Keppel's liftboat will have a higher freeboard for safer operations and retractable spud cans flushed to the bottom of the rig's hull which reduces drag when transiting between locations.

According to Crystal Heights, despite the current low oil price environment, there are a large number of offshore platforms in the world that require more efficient and cost-effective solutions such as the use of a dedicated liftboat

for their maintenance, upgrading as well as removal. Besides being utilised in the Gulf of Mexico and West Africa, they are also increasingly being employed by key operators in China, the Middle East and Southeast Asia.

Crystal Heights is a shareholder of TS Drilling Holdings and FTS Derricks which have contracted for a KFELS N Plus jack-up and a KFELS Super B Class jack-up rig respectively currently being built in Keppel FELS.

Keppel's self-elevating and self-propelled liftboat design is capable of operating at a water depth of up to 60 metres. It will be equipped with a 280-tonne deck crane enabling it to undertake the maintenance of most shallow water oil and gas fields and wind farms, as well as various workover drilling operations and well intervention applications.

In addition to its large versatile open deck space for cargo storage, the vessel has an accommodation capacity of 200 persons which is located above the main deck for greater safety considerations and meets the latest IMO requirements.

The liftboat is installed with Keppel's patented and proven jacking system designed by its subsidiary Offshore Technology Development. The strength of this system was demonstrated on the *Seafox 5* offshore wind turbine



The high specification liftboat for Crystal Heights will be built based on Keppel's innovative proprietary solution.

installer when it completed over a hundred jacking cycles in a year, which is equivalent to what a typical drilling rig does over a 20-year span. Since the start of 2015, more than 4,000 jacking systems have been ordered of which some 2,900 units are currently in operation on more than 70 jack-up rigs.

The latest contract from Crystal Heights is the second liftboat that will be built based on Keppel's innovative proprietary solution. The first liftboat is being built by Keppel's joint venture shipyard in Qatar, Nakilat-Keppel Offshore & Marine for a Qatari oilfield service company.

ST MARINE CELEBRATED INTERIM DELIVERY OF SECOND PATROL VESSEL RNOV SHINAS AND NAMING OF THIRD PATROL VESSEL RNOV SADH

Singapore Technologies Marine Ltd (ST Marine) held the Interim Delivery and Acceptance ceremony for the second Patrol Vessel, *RNOV Shinas*, together with the Naming Ceremony for the third vessel *RNOV Sadh* built for the Royal Navy of Oman (RNO) on 10 September.

The contract for the design and build of the four Al-Ofouq Class of patrol vessels was awarded by the Ministry of Defence of the Sultanate of Oman through a competitive international tender in April 2012. These four vessels will replace the current four Seb-class patrol vessels commissioned in the early 1980s.

According to RNO, these four state-of-the-art navy units are a vital tributary that will reinforce the RNO's capabilities to perform its national duty and contribute to maritime security.

The Al-Ofouq class of patrol vessels measures 75 metres in length and displaces approximately 1,250 tonnes. Armed with a modern weapon and combat management system, the patrol vessels are most suited for a variety of maritime and homeland security missions such as undertaking extended surveillance patrols of the Sultanate Exclusive Economic Zone.



ST Marine held a naming ceremony for the third patrol vessel RNOV Sadh on 10 September 2015.



ST Marine delivered patrol vessel RNOV Shinas to the Royal Navy of Oman.

SMOE WON EPC CONTRACT TO BUILD THREE TOPSIDES FOR CULZEAN FIELD DEVELOPMENT IN UK NORTH SEA

SMOE Pte Ltd has secured an Engineering, Procurement and Construction (EPC) contract worth over US\$ 1 billion (including long lead items) from Maersk Oil North Sea UK Limited. The contract includes the building of the Central Processing Facility plus two connecting bridges, Wellhead

Platform and Utilities and Living Quarters Platform Topsides for the Culzean Field Development. The facility will be installed at a water depth of some 90 metres in the UK sector of the Central North Sea.

SMOE will provide engineering, procurement, construction and onshore pre-commissioning services while

detailed engineering work will be performed by a sub-contracting partner. The facility will be located in the Culzean field situated 145 miles East of Aberdeen. The project is a high pressure, high temperature (HP/HT) gas condensate development.

The Sembcorp Marine Admiralty Yard in Singapore will be the core fabrication yard for the project, while the Sembmarine SLP yard in Lowestoft, UK, will undertake the work scope for a power generation module, two bridges and a flare.

The Culzean gas field is expected to be capable of providing around 5% of the UK's total gas consumption by 2020/21.

SMOE is an offshore engineering company which has attained a reputation as a leading turnkey contractor in the global oil and gas industry. It has a proven track record of more than 40 years in the construction of offshore fixed platforms, floating production systems, specialised modules and modularisation of onshore LNG plants for a worldwide clientele.



The EPC contract from Maersk Oil North Sea includes the building of the Central Processing Facility plus two connecting bridges, Wellhead Platform and Utilities and Living Quarters Platform Topsides for the Culzean Field Development.

ST MARINE LAUNCHED FIRST LITTORAL MISSION VESSEL – INDEPENDENCE

Singapore Technologies Marine (ST Marine) launched the first Littoral Mission Vessel (LMV) - *Independence* built for the Republic of Singapore Navy (RSN) in July 2015. The vessel was launched in a ceremony officiated by the Minister for Defence, Dr Ng Eng Hen and witnessed by the Second Minister for Defence, Mr Lui Tuck Yew, the Minister of State for Defence, Dr Mohamad Maliki Bin Osman, along with senior Ministry of Defence (MINDEF) and Singapore Armed Forces officials.

The launch of *Independence*, the first in-class LMV, marks another significant milestone for the LMV programme. The LMVs will be able to carry out maritime security operations and safeguarding of

our sea lines of communications more effectively and efficiently. Although larger in size, with an innovative design, the LMVs will be able to operate with a leaner crew size. Adopting the concept of "mission modularity", these vessels are highly configurable and can embark a range of mission modules to meet the specific mission needs.

ST Marine won the contract to design and build eight LMVs for the RSN in 2013. The contract is awarded by MINDEF. The vessels are expected to be delivered from 2016 onwards. These new vessels will replace the RSN's existing *Fearless-class* Patrol Vessels that were indigenously designed and built by ST Marine in the 1990s.



ST Marine's first Littoral Mission Vessel – *Independence* was launched in July for the Republic of Singapore Navy.

KEPPEL SHIPYARD DELIVERED BUOYANT TURRET MOORING BUOY TO SBM OFFSHORE

Keppel Shipyard has delivered the Buoyant Turret Mooring (BTM) buoy fabricated for installation on the *FPSO Turritella* to SBM Offshore. The shipyard carried out a load-out operation for the disconnectable BTM buoy, which is an integral component of the FPSO's mooring system. The BTM Buoy is designed by SBM Offshore and fabricated by Keppel Shipyard.

The BTM buoy was loaded onto a transport vessel and transported to Stones, an ultra-deepwater oil and gas

development in the Gulf of Mexico. Once there, the BTM buoy would be connected to the subsea risers and the FPSO. Once installed, the FPSO will be the deepest production facility in the world.

The load-out operation for the 3,000-tonne buoy was successfully executed using *Asian Hercules III*, the world's largest and most flexible sheerlegs owned and operated by Keppel Offshore & Marine's subsidiary, Asian Lift.

KEPPEL SHIPYARD SIGNED CONTRACT FOR THIRD FLOATING LIQUEFACTION FACILITY CONVERSION WORTH US\$684M

Keppel Shipyard Limited (Keppel Shipyard) has signed a contract worth approximately US\$684 million with Golar Gandria N.V., a subsidiary of Golar LNG Limited (Golar LNG), to perform the conversion of a Moss type Liquefied Natural Gas (LNG) carrier, the *GANDRIA*, into a Golar Floating Liquefaction (GoFLNG) facility. This is the shipyard's third FLNG conversion contract with Golar LNG.

The contract for the conversion of the *GANDRIA* marks the exercise of the second of two options, which were part of an earlier contract awarded by Golar to Keppel Shipyard. This was for the conversion of the Moss LNG carrier, *HILLI*, into a GoFLNG facility. The first option was exercised in December 2014

for the conversion of the *GIMI*, also a Moss type LNG carrier.

Keppel Shipyard has recently set up a new design and technology arm, Gas Technology Development (GTD), to focus further efforts on developing solutions for LNG markets. With enhanced capabilities and more innovative solutions, the company plans to commercialise mid-scale LNG offshore sources in relatively benign met-ocean conditions.

The work scope for Keppel Shipyard in converting the *GANDRIA* is similar to that for the two earlier contracts. Keppel Shipyard will provide the design, detailed engineering and procurement of the marine systems and all of the

conversion-related construction services. Keppel Shipyard will once again engage Black & Veatch to provide design, procurement and commissioning support services for the topsides, as well as the liquefaction process utilising its established PRICO® technology. Black & Veatch is an employee-owned, global leader in building critical human infrastructure in energy, water, telecommunications and government services.

Similar to the *GIMI*, full construction activities of the *GANDRIA* will commence only after Keppel Shipyard has received a notice to proceed. This notice is expected to be issued in 2016. The GoFLNG *GANDRIA* will be scheduled for delivery in approximately 31 months after receipt of such notice to proceed.

Golar LNG is one of the world's largest independent owners and operators of LNG carriers. Golar's innovation delivered the world's first Floating Storage and Regasification Units (FSRU) based on the conversion of existing LNG carriers. Golar LNG leads the industry with committed projects and is progressing plans to grow its business further upstream by deploying its floating liquefaction technology.



Keppel Shipyard is currently performing the conversion of another existing Moss type Liquefied Natural Gas (LNG) carrier, the *Hilli* (left), into a Golar Floating Liquefaction (GoFLNG) facility (right).

KEPPEL ENHANCES CAPABILITIES WITH ACQUISITION OF LETOURNEAU™ JACK-UP RIG DESIGNS, RIG KIT AND AFTERMARKET SERVICE BUSINESSES

Keppel Offshore & Marine Ltd (Keppel O&M) has through its wholly owned subsidiary, Keppel Offshore & Marine USA, Inc., entered into a Stock and Asset Purchase Agreement with Cameron International Corporation (Cameron), to acquire Cameron's offshore rigs business for US\$100 million.

Cameron is a leading provider of flow equipment products, systems and services to the oil and gas industries worldwide. Its offshore rigs business comprises the LETOURNEAU™ jack-up rig designs, rig kit business, and aftermarket services.

The LETOURNEAU™ suite of jack-up rig designs are established designs that have been popular with certain market segments and have a proven track record of operating in a variety of environments. The designs Keppel is acquiring include the LETOURNEAU™ Super 116E, WORKHORSE, Super Gorilla XL and Jaguar. These designs will add to Keppel's current offerings in the jack-up rig market.

With the acquisition, Keppel will be

able to offer customers the LETOURNEAU™ rig designs through the sale of rig kits to shipyards, or deliver ready-to-drill rig solutions from Keppel yards worldwide. The rig kits include jack-up leg components, elevating units/jacking system and cantilever/skidding system. Support equipment such as cranes and anchor winches are also options in the rig kits.

Another aspect of the business is the provision of aftermarket services. With about 100 LETOURNEAU™ rigs currently operating around the world, many operators require servicing and repair of their rigs. Keppel will be able to leverage its network of shipyards worldwide to better meet these customers' needs. Besides repairs, upgrades and modifications, jack-ups are required to undergo five-year Class recertification special periodic surveys.

Keppel O&M sees this as an opportune and strategic acquisition as it will broaden its suite of jack-up rig design offerings, as well as enhance its capabilities to service its customers through the provision of expanded aftermarket sales and services.

With the current low oil price, there has been a slowdown in orders for newbuild rigs. With rig owners looking at repairing and upgrading their current fleet, Keppel O&M believes it can make best use of its after sales service infrastructure to service rigs of both the LETOURNEAU™ as well as Keppel FELS designs, which are popular designs operating in many of the world's offshore oil fields. Keppel O&M has the expertise to build rigs of the LETOURNEAU™ design having previously completed 16 such rigs.



With its expertise in the design and construction of jack-up rigs, Keppel Offshore & Marine has added the LETOURNEAU™ suite of jack-up rig designs and aftermarket services to its offerings.