

# OFFSHOREMARINE

A newsletter of Keppel Offshore & Marine

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**DELIVERING SOLUTIONS  
WITH EXECUTION  
EXCELLENCE**

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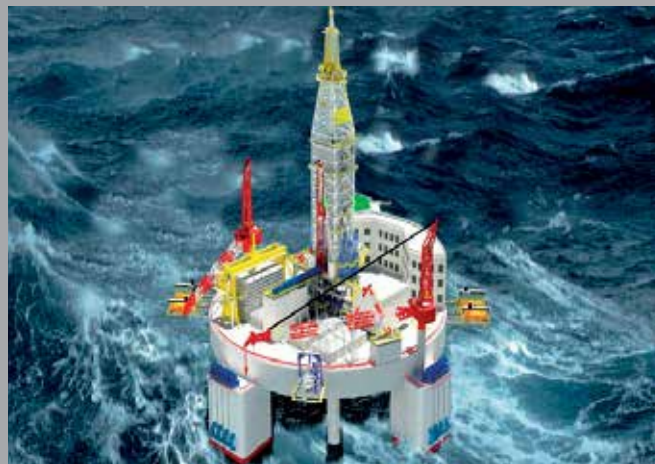
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Keppel's low motion semisubmersible design wins engineering award

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# Forging ahead

Despite continued challenges in the industry, Keppel Offshore & Marine (Keppel O&M) delivered a robust performance on the back of streamlined operations and new contracts. *OffshoreMarine* reproduces the speech by Mr Loh Chin Hua, CEO of Keppel Corporation and Chairman of Keppel O&M at Keppel Corporation's 2Q and 1H2018 results briefing.

The 3rd of August will mark Keppel Corporation's 50th anniversary. Over the past five decades, starting from a small shipyard, the Group has expanded, diversified and transformed itself, as we seized opportunities and overcame myriad challenges in our growth journey.

Today, Keppel is an eco-system of companies working closely together to provide solutions for sustainable urbanisation. Whether it is the search for energy through our rigs and vessels, the provision of solutions for gas or renewables, reliable infrastructure such as power, waste-to-energy or water treatment plants, high quality built environments, or physical and digital connectivity, Keppel is well placed to meet the market's needs.

Our multi-business strategy and geographical diversification have enabled the Company to remain resilient, despite cyclical headwinds in some of our businesses.

## OFFSHORE & MARINE

There is growing optimism in the O&M industry, with Brent crude prices hovering above US\$70 per barrel. However, the rig market continues to be weighed down by

a supply overhang. Rig utilisation has improved, but day rates have remained stagnant.

Nevertheless, in regions such as the UK sector of the North Sea, the Middle East and Southeast Asia, we are seeing more rig tender activities. In Brazil and Mexico, international oil companies are also expected to increase investments in the oil and gas sector.

There has also been an increase in the number of floating production projects awarded over the past year. In June this year, the Energy Maritime Associates estimated that there are 235 projects in various stages of study potentially requiring a floating production or storage system. Of these, 62 are in the bidding or final design stage.

In short, the recovery of the O&M business is expected to continue, but at an incremental pace.

Against a challenging backdrop, our O&M Division made a net loss of \$40 million, compared to a net profit of \$11 million in 1H 2017. This was mainly due to lower work volume, lower contribution from associated companies and higher taxes in overseas operations.

Keppel Offshore & Marine (Keppel O&M) has significantly reduced its overheads in the last few years, due to the extensive rightsizing it has undertaken. This has helped the company achieve an operating profit of \$14 million in 1H 2018 in spite of the lower volume of work.

As at end-June 2018, we have secured over \$1.2 billion of new orders, slightly more than the new orders secured for the whole of 2017. In 2Q 2018 alone, we clinched \$680 million worth of contracts.

The new contracts secured were for two new jackups for Borr Drilling, as part of a five-rig deal worth a total of US\$745 million, two dual-fuel dredgers for Van Oord, a dual-fuel bunker tanker for Sinanju as well as a Liquefied Natural Gas (LNG) bunkering vessel for FuelNG, our joint venture with Shell.

## MAJOR DELIVERIES

Keppel O&M's net orderbook was \$4.6 billion as at end-June 2018, excluding our projects for Sete Brasil, compared to \$3.9 billion as at 31 December 2017. This is the

*Continues on page 4...*

Continued from page 3.



The Hilli Episeyo Floating Liquefaction vessel converted by Keppel Shipyard has commenced full commercial operations in Cameroon

first time since 2014 that Keppel O&M's net orderbook has risen for two consecutive quarters.

In 1H 2018, Keppel O&M delivered a Floating Production Storage and Offloading (FPSO) vessel, a dual-fuel LNG tug and two jackups to Borr. Hilli Episeyo, the world's first converted floating liquefaction vessel which Keppel developed in partnership with Golar, has commenced full commercial operation in offshore Cameroon. This has resulted in increasing market confidence in the conversion approach which

adds value with its faster time to first LNG production and competitive pricing.

Since 2015, we have won about \$1.8 billion of orders for our gas solutions, making up about 38% of all new orders. With our ability to design, develop and integrate solutions across the gas value chain, Keppel aims to be the gas industry's preferred partner. The growing adoption of LNG as a marine fuel, driving demand for newbuilds, conversions and upgrades, also augurs well for the business.

The Division is also actively seeking opportunities in production assets, specialised vessels, gas solutions, floating infrastructure and offshore renewables.

# Building South East Asia's first LNG bunkering vessel

Keppel Offshore & Marine (Keppel O&M) announced on 5 June 2018 its wholly-owned subsidiary, Keppel Singmarine, has secured a contract from FueLNG, a joint venture between Keppel O&M and Shell Eastern Petroleum (Pte) Ltd, to build South East Asia's first Liquefied Natural Gas (LNG) bunkering vessel.

Scheduled for completion in 3Q 2020, the dual-fuel LNG bunkering vessel will have a capacity of 7,500 cubic metres. FueLNG will receive a grant of up to S\$3 million as part of the Maritime and Port Authority of Singapore's (MPA) LNG Bunkering Pilot Programme (LBPP).

Mr Andrew Tan, CEO of MPA, said, "We are pleased that FueLNG, Keppel and Shell are taking the lead in growing the LNG bunkering infrastructure in Singapore. As the world's largest bunkering port, it is important that we support the development of LNG bunkering in

our port to cater to future demand for LNG as a marine fuel."

The vessel will be built to the MTD 7500U LNG design, a proprietary design of Keppel O&M's ship design and development arm, Marine Technology Development (MTD), for greener and safer bunkering activities within the Singapore port. The vessel's key features include high manoeuvrability which enables bunkering without tug assistance, as well as propulsion and power management systems that optimise fuel consumption.

Mr Abu Bakar, Managing Director (Gas & Specialised Vessels), Keppel O&M, said, "We are delighted to build FueLNG's first LNG bunkering vessel, which comes on the back of other recently secured contracts for newbuild solutions along the gas value chain. Keppel O&M is able to harness its expertise in newbuilds and LNG to provide customised solutions for clients, and is in

a strong position to capture opportunities as the industry adopts greener solutions."

Mr Laurant Wetemans, Director, FueLNG, and General Manager, Shell Downstream LNG, added, "Shell's global expertise in LNG bunkering will support this growth in Singapore. This vessel enables FueLNG to provide ship-to-ship bunkering services to customers for cost-effective, cleaner fuel alternatives. The customised design enables FueLNG to operate efficiently and safely within the port of Singapore and we look forward to continuing to work with industry stakeholders to enhance and provide LNG bunkering infrastructure in Singapore."

Capable of running on both LNG and marine diesel oil, the LNG bunkering vessel is more efficient than conventional bunker vessels. It is able to harness boil-off gas, a by-product of bunkering operations as well as the continuously evaporating LNG in the cryogenic tank, which would otherwise be flared off. It is also designed with a barge-like extended flat surface to maximise vessel compatibility which will enable FueLNG to deliver LNG bunkers to a wide range of vessels.

A twin screw azimuthing propulsion system also allows crabbing manoeuvre during bunkering operations, minimising tug utilisation and in turn reduces fuel consumption and emissions.



To be built by Keppel O&M, South East Asia's first LNG bunkering vessel will provide LNG to global customers who pass through the Port of Singapore

# Keppel sells five additional rigs to Borr Drilling

Keppel Offshore & Marine has through its wholly-owned subsidiary, Keppel FELS, entered into an agreement with Borr Drilling Limited (Borr Drilling) on 16 May 2018 for the sale of five existing jackup rigs for a total value of approximately US\$745m.

These are existing jackup rigs which are currently being built by Keppel FELS to the KFELS B class designs. Of the five rigs, two were originally built for Grupo R (being the Cantarell V and Paraiso II rigs) and one for Falcon Energy Group. Keppel FELS has already terminated the contracts with the respective owners. Two other rigs were being built in anticipation of potential demand.

The total price of the five rigs excludes the down payments which had already been made by the respective original owners. Borr Drilling will pay a first instalment of US\$288 million and the remaining amounts are payable within five years from the respective delivery dates of each individual rig, on a seller's credit with interest at market rates. The rigs are scheduled to be delivered progressively from 4Q 2019 to 4Q 2020, with one rig to be delivered in 2019 and four rigs in 2020.

Mr Chris Ong, CEO of Keppel O&M said, "The agreement with Borr Drilling demonstrates that rig owners continue to look for reliable, high quality rigs, such

as the KFELS B Class, to maximise efficiency and productivity. This is a win-win agreement for all parties and enables Keppel O&M to further improve our cashflow, minimise the holding risks of the projects, and clear several of the deferred orders. We look forward to providing Borr Drilling with another five premium, safe and cost-efficient rigs and continuing our strong partnership."

CEO of Borr Drilling, Mr Svend Anton Maier, added, "We are pleased to be getting another five high quality jackup rigs from Keppel FELS on top of the five we acquired earlier. Our partnership with Keppel is crucial as it enables us to provide the market with the latest in jackup rig technology, safety and operability. This is an opportune time for us to grow our fleet of highly capable jackup rigs as the market is showing signs of recovery from the bottom of the business cycle."

In addition to the above five rigs, Borr Drilling had also previously taken over the contracts for five KFELS Super B Class jackup rigs that Keppel FELS was building for Transocean.



With the latest agreement, Borr Drilling has ordered a total of 10 jackup rigs from Keppel FELS, including the SKALD jackup (above) which was delivered in June 2018

## Second of ten rigs to Borr Drilling delivered



The Keppel FELS and Borr Drilling project teams celebrating their strong partnership on the completion of the SKALD jackup rig

On 13 June 2018, Keppel FELS delivered the state-of-the-art jackup rig, SKALD, to Borr Skald Inc, a subsidiary of Borr Drilling Limited (Borr Drilling) safely, on time and on budget. It is the second jackup rig that Keppel has delivered to Borr Drilling following the delivery of the SAGA earlier this year, with another eight on order.

Mr Chris Ong said, "The delivery of a second high-specification KFELS Super B Class rig to Borr Drilling reaffirms our design and execution capabilities as well as our commitment to provide win-win solutions for our customers. We have leveraged the synergies of working on multiple rigs for Borr Drilling to improve efficiency and ensure an on time and on budget delivery. This has also been achieved with an excellent safety record while maintaining Keppel FELS' hallmark quality standards.

"Our proven KFELS B Class suite of designs has distinguished itself in providing better value and drilling efficiency for drilling operators who prefer high-

specification rigs of the latest designs. We look forward to strengthening our partnership with Borr Drilling and delivering another eight rigs to them as they grow their fleet of highly capable rigs."

Built to Keppel's renowned KFELS Super B Class design, SKALD is capable of operating in 400 feet water depth and drilling to 35,000 feet. Equipped with cantilever skid-off capabilities, with a maximum combined cantilever load of 3,700 kips, and high capacity hook loads of two million pounds, the KFELS Super B Class has tremendous horse power during drilling operations.

Mr Svend Anton Maier added, "We are pleased to add another premium jackup rig to our fleet. With 10 jackup rigs ordered from Keppel FELS, we ensure that we get state-of-the-art rigs that can deliver the highest operational performance to our customers around the world."

Mr Tan Leong Peng, Executive Director (Offshore), Keppel O&M, said, "The project team has built a close rapport and mutual

understanding with the customer and this has meant smoother processes across the projects. Any issues or lessons learnt resolved on one project directly translates to time and cost savings on the remaining projects. The trust and communication allows our customers to have a small but effective project management team which results in cost savings for our customers as well.

"I would like to thank key personnel from Keppel who have been guiding the project team on ensuring a smooth construction and commissioning for the on-time delivery of this project including Roy Lim (Shipyard Manager), Joe Lim (Assistant Shipyard Manager), Krishna (Senior Commissioning Manager), and Ting Shing Mau (Project Manager) as well as the Borr Drilling project team championed by Martin Lovse (Project Manager) and Andre Chiasson (Commissioning Manager)."

# Two contracts for conversion and integration work

On 22 July 2018, Keppel Offshore & Marine (Keppel O&M) announced two new contracts secured by its wholly-owned subsidiaries in Brazil and Singapore.

In Brazil, Keppel FELS Brasil has been engaged by its long-standing customer, MODEC Offshore Production Systems (Singapore) Pte Ltd., part of the MODEC, Inc. group (collectively "MODEC"), to undertake the topside module fabrication and integration of the FPSO Carioca MV30, a Floating Production Storage and Offloading vessel (FPSO). This is the sixth FPSO collaboration between Keppel FELS Brasil and MODEC.

In Singapore, Keppel Shipyard has been entrusted with the conversion of a LNG Carrier to a Floating Storage and Re-gasification Unit (FSRU) by a leading global operator of oil and gas production vessels.

Mr Chris Ong, CEO of Keppel O&M, said, "Keppel O&M has a strong track record in production, storage, gasification or liquefaction vessels, having successfully delivered more than 130 of such units over the years.

"FPSO Carioca MV30 is our 11th FPSO project for Brazil, and as the most-established shipyard in Brazil, BrasFELS is well-positioned to deliver it to Keppel O&M's hallmark of executional excellence. Meanwhile, for Keppel Shipyard, this is our fourth FSRU conversion

contract and is part of our comprehensive suite of solutions for the gas value chain."

BrasFELS shipyard, Keppel FELS Brasil's facility in Angra dos Reis, Rio de Janeiro, Brazil, will commence the fabrication of the modules for the FPSO in 4Q 2018.

When completed, FPSO Carioca MV30 will have the capacity to process 180,000 barrels of crude oil per day (bopd) and 212 million cubic metres of gas per day. The unit's storage capacity is 1.4 million barrels of crude oil.

The FPSO will be deployed at the Sepia field, which is located in the pre-salt region in the Santos Basin,

some 250 kilometres off the coast of Rio de Janeiro, Brazil.

Mr Sateesh Dev, President & CEO of MODEC Pte Ltd., said, "Brazil continues to grow its production capacity to tap its significant oil and gas reserves. MODEC is committed to support the nation's energy aspirations, and are glad to have a good partner in Keppel Group to support us in this journey. Indeed, BrasFELS has been our choice shipyard in Brazil because of their reliability, cost-efficiency and capability to meet our needs."

For the FSRU conversion project, apart from repair and life extension works, Keppel Shipyard will undertake shipyard



Keppel FELS Brasil previously delivered its fifth project to MODEC, the FPSO Cidade de Campos dos Goytacazes MV29, to MODEC in September 2017



engineering, installation and integration of the regasification module and upgrading of the cargo handling system. Scheduled for delivery at the end of 2018, the FSRU will be capable of re-gasifying up to 750 million standard cubic feet of natural gas per day.

Keppel Shipyard has previously

delivered three FSRUs, including the world's first FSRU conversion. With the increase in demand for LNG in power generation, FSRUs are a fast, flexible, cost-effective, safe and environmentally-friendly solution that is well suited for deployment in remote areas with smaller energy requirements. The world's first converted FLNG

vessel, Hilli Episeyo, has achieved final acceptance and commenced commercial operations for Perenco in Cameroon. This was accomplished within four years of the contract award to Keppel Shipyard.

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## ONE sends its first vessel to Keppel



ONE Commitment is the first vessel from Ocean Network Express (ONE), a merged entity of three Japanese carriers, to be docked at Keppel Shipyard

A trusted name in ship repair and conversion, Keppel Shipyard has a strong track record in giving vessels a new lease of life.

On 15 April 2018, Ocean Network Express (ONE), a merger of the container shipping businesses of three major Japanese carriers – Mitsui OSK Lines (MOL), NYK Line, and "K" Line – sent its first vessel, ONE Commitment, to Keppel Shipyard. The vessel, which is managed by MOL Ship Management, underwent refurbishing and repainting works and sailed away on 2 May 2018.

The departure of ONE Commitment was followed by the arrival of ONE Competence, which required the similar scope of work as its sister vessel.

ONE Competence sailed off on 11 June 2018.

Mr Chor How Jat, MD of Keppel Shipyard, said, "All three of the Japanese shipping companies are our regular customers and we are very proud that the merged entity, ONE, has sent its first vessel to Keppel Shipyard. It reflects the strong trust as well as the quality and value we have provided them over the years. We look forward to continuing this strong partnership with ONE."

# FPSO La Noumbi on track for delivery to Perenco Congo

Keppel Shipyard is on track to deliver a Floating Production Storage and offloading vessel (FPSO) for a Perenco Group project located off the Republic of Congo, Africa – on time and with a strong safety record. Scheduled for delivery in 3Q 2018, it will sail to the Yombo Masseko permit, held by National Petroleum Company of the Congo (SNPC) and operated by Perenco Congo.

The FPSO was named La Noumbi at Keppel Shipyard on 26 July 2018 and witnessed by Mr Jean-Marc Thysthere Tchicaya, Minister of Hydrocarbons, Republic of the Congo.

Mr Chris Ong, CEO of Keppel Offshore & Marine said, “We are pleased to be on track to deliver a sixth project to Perenco to their satisfaction. Having delivered over 40% of the world’s converted FPSOs to-date, we are able to leverage our rich experience as well as strong partnership with Perenco to deliver a high quality FPSO in a cost-efficient and safe manner.

“This is also our fifth project for the Republic of the Congo and we are proud to have been able to support the development of the nation’s significant oil reserves over the years. In fact, the FPSO Conkouati which La Noumbi will be replacing was first converted by Keppel Shipyard in 1991 and has



The FPSO La Noumbi is the fifth project for the Republic of the Congo and the sixth project for Perenco

served the Yombo field for more than 25 years.”

Keppel Shipyard’s work scope on the conversion of the crude oil tanker into an FPSO included the installation and integration of topside process skids, fabrication of a new accommodation module as well as life extension works.

Mr Benoit de la Fouchardiere, CEO of Perenco, said, “The FPSO La Noumbi project is a fundamental asset to maintain the production of the Yombo field 25 years after its first oil and enhance it through the green field development of Masseko, an undeveloped discovery located 10 km away. The FPSO has been designed during the

oil crisis with a clear objective to demonstrate that we can continue to invest during the low oil price as long as we pay attention to all the details of a project and do not hesitate to be innovative at all steps. As this is not a given, by partnering Keppel we were confident that our project would be delivered safely, on time and on budget, with a clear execution of the new philosophy.”

La Noumbi will be capable of producing 12,000 barrels of oil per day (bopd), processing 120,000 barrels of water per day and storing 762,062 barrels of oil.

# Singapore's first VLCC scrubber retrofit

Keppel Shipyard completed Singapore's first scrubber unit retrofit installation on a Japanese Very Large Crude Carrier (VLCC) in July 2018.

Mr Chor How Jat, MD (Conversions & Repairs), Keppel Offshore & Marine and MD of Keppel Shipyard said, "We are pleased to be selected by our long-standing customer, for their first scrubber retrofit job. As the industry looks to adopt more sustainable measures to reduce the impact on the environment, Keppel Shipyard stands ready with a suite of advanced, cost-effective, and quick solutions that can meet the requirements of our customers in reducing emissions. As a leading

shiprepair yard, we have a strong track record undertaking retrofit and conversion projects."

Keppel Shipyard expedited the scrubber retrofit on the VLCC and achieved completion in less than a month - safely and within budget. In order to meet the tight deadline and minimise downtime for the vessel, Keppel Shipyard maximised the preparatory work by fitting the complete scrubber and supporting systems in one prefabricated module before the vessel arrived in the yard in early June. As early as a year ago, the shipyard had started working closely with the customer, providing design development coordination, 3D scanning and detailed engineering.

With the implementation of International Maritime Organization's (IMO) new 0.5% global sulphur cap on fuel content effective from 1 January 2020, ship owners are actively pursuing solutions to reduce emissions such as the installation of scrubbers.

Known technically as Exhaust Gas Cleaning Systems, scrubbers treat the vessel's exhaust gas with chemical reagents to remove sulphur oxide compounds (SOx). This allows the vessel to discharge a minimum amount of SOx into the environment and meet the requirements of the IMO's standard.



With the implementation of IMO's new 0.5% global sulphur cap on fuel content effective from 1 January 2020, ship owners are actively pursuing solutions, such as the installation of scrubbers, to reduce emissions

# Clockwork execution

Leveraging its newbuild expertise and global network of yards, Keppel Offshore & Marine (Keppel O&M) is on course to extending its track record in the building of specialised vessels for the non-oil and gas sector.

On 13 July 2018, Keppel Singmarine and Keppel Nantong Shipyard celebrated the launch of the second of three 3,500m<sup>3</sup> hopper capacity Trailing Hopper Suction Dredgers (TSHD) currently being built for Jan De Nul. The project team achieved 1 million man-hours without any lost-time incidents. Expected to be completed in the second half of 2018, this dredger will be able to dredge to a maximum depth of 27.6m.

Over in Singapore, the team comprising members from Keppel FELS and Keppel Singmarine marked a significant milestone with the keel laying ceremony for the first of two 6,000m<sup>3</sup> TSHDs currently being

built for Codralux, a subsidiary of Jan de Nul Group.

The event was held on 19 July 2018 and attended by management from Keppel O&M, Jan De Nul, and classification society Bureau Veritas. Expected to be completed

in the second half of 2019, this will be the world's first dredger to comply with the European Union (EU) Stage V regulations, which set stricter limits on emissions of particulate matter.



The 3,500m<sup>3</sup> TSHD launched in Keppel Nantong Shipyard, China, will be able to dredge to a maximum depth of 27.6m



Being built in Singapore, the 6000m<sup>3</sup> TSHD will be the world's first EU Stage V dredger

# Leader in repair and conversions

Keppel Shipyard received recognition for its continuous efforts in innovation at the 11th Seatrade Maritime Awards Asia on 25 April 2018, where it received the Ship Repair & Innovation Award.

The Awards, which was held in conjunction with Singapore Maritime Week 2018 and attended by close to 400 maritime industry professionals, recognises the contributions and achievements of companies and individuals in the maritime sector.

Keppel Shipyard was recognised for its impressive track record in ship repair and conversion,



Mr Albert Kee (centre), ED (Operations), Keppel Shipyard, received the Ship Repair & Innovation Award on behalf of the company

which includes the conversion of a semisubmersible heavy lift vessel to a crane vessel in just eight months. In addition, Keppel Shipyard is able to carry out 3D

scanning of vessels and use the data to engineer solutions for the retrofit of ballast water treatment systems and sulphur oxide scrubber equipment.

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# At the forefront of new energy

Keppel Prince Engineering, Australia's largest and Victoria's only wind turbine manufacturer, received the New Energy Technology Award at the

Manufacturing Hall of Fame event in Melbourne, Australia. Held on 29 May 2018, the event recognises outstanding businesses and individuals in manufacturing.

Keppel Prince Engineering has built wind turbine towers for leading turbine suppliers around the world. It also undertakes repair and maintenance activities for the aluminium smelter industry, and provides industrial engineering fabrication services to Telstra and other companies in Australia.

Moving forward, Keppel Prince Engineering will be making small investments to reorganise its wind turbine fabrication facilities to improve productivity, including through the application of automation and robotics.



Mr Stephen Garner (right), GM of Keppel Prince Engineering, received the New Energy Technology Award on behalf of the company from Mr Ben Carroll (left), Australia's Minister for Industry and Employment

# Top in safety



The Keppel Group received 28 awards at the WSH Awards, the highest number of awards won by a single organisation this year

Keppel Offshore & Marine (Keppel O&M) clinched 26 awards at this year's Workplace Safety and Health (WSH) Awards, a strong testament to its commitment to high levels of safety at work sites for all stakeholders. This is part of the 28 awards received by the Keppel Group, the highest number of awards won by a single organisation this year.

Organised by the Workplace Safety and Health Council (WSHC) and Ministry of Manpower (MOM), Singapore, the WSH Awards recognises projects, individuals, and companies for their contributions to workplace safety.

Keppel O&M received 22 awards under the Safety and Health Award Recognition for Projects (SHARP) category for its outstanding project safety and health management systems.

Keppel Singmarine, the specialised shipbuilding arm of Keppel O&M, received its first WSH Performance (Gold) Award for its outstanding safety record of over 2.5 million

man-hours worked without any accidents in 2017.

Speaking at the awards dinner, Mrs Josephine Teo, Minister for Manpower, highlighted Keppel Singmarine as an example of strong ownership of WSH, and commented that "Keppel Singmarine's efforts prove that a

strong sense of ownership makes a real difference."

Mr Abu Bakar, MD, Keppel Singmarine, and MD (Gas & Specialised shipbuilding), Keppel O&M, reiterated the company's commitment to safety. "Safety is a core value at Keppel and an integral part of our business. We



Mr Edmund Lek (right), ED (Operations – China), Keppel O&M, received Keppel Singmarine's first WSH Performance (Gold) Award from Mr Zaqy Mohamad (left), Minister of State, Ministry of Manpower and Ministry of National Development

**WSH AWARDS IN 2018**

SHARP AWARDS	Keppel FELS	BORR SAGA BORR SKALD BORR TIVAR ENSCO 123 TS JASPER FECON 1 FECON 2 FECON 3 JDC HAKURYU-15 CAN-DO Drillship BORR JU CAN-DO II Cargo Barge ENSCO DPS-1
	Keppel Shipyard	BW Adolo BW Catcher Culzean FSO Turret Bokalift 1 FPSO MTC Ledang Hilli Episeyo LNG Lerici
	Keppel Singmarine	H389 (MPV EVEREST) H395 (KST LIBERTY)
PERFORMANCE AWARDS	Keppel Singmarine Keppel FELS	Gold Silver
INNOVATION AWARDS	Keppel FELS	Shackle Jig
SUPERVISOR AWARDS	Keppel FELS	Thanarajan Verasalam

are committed to provide a safe and healthy workplace for all our stakeholders”, he said.

Keppel FELS clinched the WSH Performance (Silver) Award for exemplary safety performances and implementation of strong WSH management systems, as well as the Innovation Award for its new shackle jig which improved the entire process of rigging and de-rigging shackles used in the lifting of heavy blocks.

Mr Tan Leong Peng, ED (Offshore), Keppel O&M, said, “Innovation is an integral and critical component in building a safe environment. At Keppel FELS, we constantly innovate to build better tools, develop more efficient work processes and expand communication channels with our employees so that we can improve their overall well-being.”

On the individual level, Mr Thanarajan Verasalam, Facility Superintendent at Keppel FELS, was conferred the Supervisor Award for his exemplary performance in ensuring a safe working environment for workers under his charge.



Mr Thanarajan Verasalam (right), Facility Superintendent at Keppel FELS, received the Supervisor Award from Ms Kala Anandarajah, Deputy Chairperson, WSH Council

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### New shackle jig reduces risks and improves productivity

In Keppel FELS, heavy blocks are moved from one place to another by attaching shackles which will be then be lifted together with the heavy blocks by a crane. This process requires workers to use a forklift to pick up shackles from the rack and transfer them to an open space. Workers would then manually remove the shackle's pin and nut to insert the crane lifting sling.

After securing the shackle, the crane will move the block to the designated location after which workers will remove the shackle's pin and nut to detach

the crane lifting sling. This process of rigging and de-rigging involves pinch points, heavy lifting work, and requires five workers and a forklift.

To improve the entire process, Keppel FELS designed a new shackle jig that can hold up to eight shackles compared to the old design which can only hold four shackles. Shackles can be placed in the upright position, eliminating the need to use a forklift. Requiring only two workers to execute the job, the new system has reduced pinch points and the number of man-hours involved

from 146 to 29 hours, achieving 80% cost savings for one rigging or de-rigging job.



The innovative shackle jig drastically reduced the number of man-hours required for rigging and de-rigging jobs, resulting in significant cost savings

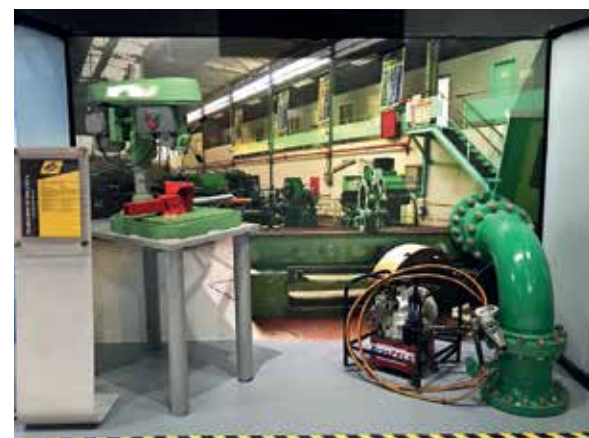
## New HSE training Centre in BrasFELS

Safety is a core value at Keppel, and an integral part in the daily operations of its business units around the world.

On 19 July 2018, BrasFELS shipyard held the opening ceremony for its Health Safety Environment (HSE) Training Centre. Mr Herman Effendy, President of BrasFELS, officially opened the centre and said in his opening remarks, "This HSE Training Centre builds on our efforts to further strengthen the safety culture in BrasFELS. Safety is a cornerstone of our operations, and this starts with the training

and educating of employees to ensure they are empowered to stop unsafe work."

The 500 square metre HSE Training Centre comprises two auditoriums and a room for practical sessions such as safety training for new BrasFELS employees. In addition, there is a showroom where participants can learn more about high impact risk activities (HIRA) performed at the shipyard. This includes working at height, with electrical systems, and in confined spaces.



The new HSE Training Centre in BrasFELS shipyard features a showroom area where visitors including new employees can learn more about safety procedures in relation to topics such as emergency response and working at height



# Keppel-NUS Corporate Laboratory wins engineering award for semisubmersible design

An innovative Low Motion Semisubmersible (LMS) developed by the Keppel-NUS Corporate Laboratory, an industry-university partnership between Keppel Corporation and the National University of Singapore (NUS), was conferred the Prestigious Engineering Achievement Award on 26 July 2018 under the category of Applied Research and Development by The Institution of Engineers, Singapore (IES).

Designed for safer, cost-effective and more efficient operations, the versatile LMS can be adopted for drilling, production, or accommodation in harsh, deep water and arctic environments.

Mr Aziz Merchant, Co-Programme Leader, Keppel-NUS Corporate Laboratory, and Director, Technology, Keppel Technology and Innovation (KTI), said, "We are honoured to receive the IES Prestigious Engineering Achievement Award. With innovative features such as the circular ring pontoon, this LMS design is vastly different from the traditional semisubmersible design. It represents a rig of tomorrow and has the potential to disrupt the deepwater segment of the offshore industry."

"This is the fourth such award that Keppel has received from IES, having previously won for our KFELS B Class jackup and two



Representatives from the Keppel-NUS corporate Laboratory led by Co-Programme Leaders Mr Aziz Merchant (fifth from left), and Professor Chow Yean Khaw (third from left), receiving the Engineering Achievement Award from Mr Heng Chee How (fifth from right), Singapore's Senior Minister of State for Defence

semisubmersible designs. It is a testament to the strength of our R&D capabilities, which further entrenches our leadership position in the offshore and marine industry."

Professor Chow Yean Khaw, Co-Programme Leader, Keppel-NUS Corporate Laboratory, and Executive Director, Maritime Institute @ NUS, said, "This award is a result of years of close collaboration between researchers at NUS and engineers at Keppel. By marrying academic research and industry applications, we were able to develop a game-changing rig design that is practical, safe and efficient."

Harsh environments result in higher vessel motions which reduce operation uptime and introduce difficulties in accurately calculating motions and loads. The LMS developed by the Keppel-NUS Corporate Laboratory has significant advantages over designs

of existing semisubmersibles, including:

- Low motion characteristics and optimal station keeping capabilities through its unique column shape, a circular ring pontoon, and additional inclined pencil columns with water chambers
- Increased operability uptime in harsh environments from 60% to around 90%
- Reduced drilling maintenance and operation costs from the use of a surface Blow Out Preventer (BOP) application enabled by low motion characteristics
- Optimised for ease of construction

The characteristics of the LMS were verified by a model of the LMS being tested in simulated harsh environment conditions in an ocean basin laboratory in the Netherlands.

# Building bonds in Houston

The annual Offshore Technology Conference (OTC) held in Houston, Texas is the world's biggest oil and gas conference which sees industry leaders converge to provide market updates and discuss opportunities. The 2018 edition was held from

30 April to 3 May and focused on subjects such as the reducing costs and improving overall value, new technologies and safety practices, among other recurring themes.

One of the highly anticipated

private cocktail receptions at OTC is hosted by Keppel Offshore & Marine (Keppel O&M). Held on 1 May, some 900 customers, partners and associates came to network and develop old and new partnerships.



1. (From L to R) Mr Abu Bakar, MD (Gas & Specialised vessels), Keppel O&M; Dr Lee Boon Yang, Chairman, Keppel Corporation; and Mr Paul W. Verheul, COO, Van Oord;  
 2: Dr Carl Trowell, CEO and President, Ensco; Mr Clay Williams, Chairman, President and CEO, NOV; and Mr Loh Chin Hua, CEO, Keppel Corporation and Chairman, Keppel O&M;  
 3: Mr Chris Ong, CEO, Keppel O&M; Mr Sateesh Dev, President & CEO of MODEC Offshore Production Systems (Singapore); Mr Chor How Jat, MD (Conversions & Repairs), Keppel O&M;  
 4: Mr David Wukasch Jr., Project Engineer, Diamond Offshore; Mr Chris Ong; Mr David Wedgeworth, Director of Engineering Projects, Diamond Offshore, and Mr Tan Leong Peng, ED (Offshore), Keppel O&M;  
 5: Mr Loh Chin Hua; Mr Patricio Alvarez Morphy Orvañanos, Senior Vice President of Perforadora Central; Mr Simon Lee, President of Keppel O&M USA;  
 6: Mr Chor How Jat; Mr Maarten Van Aller, COO, Floating Production, Petrofac; Mr Luc Pescio, MD, Ocean Dynamics;



7: Mr Luis Ortiz Quirch, Corporate Commercial Director, Grupo R; Mr Raschid Mohamed, Director, Corporate Planning and Business Development, Grupo R; Mr Chris Ong, Mr Patricio Garza, Director, Grupo R;  
 8: Ms Andrea Gay, Deputy GM, Business Development (Gas), Keppel O&M; Mr Chris Ong; Mr Keesjan Cordia, Chairman at Oceanteam ASA; Mr Volckert Van Reesema, Co-founder MidOcean Marine and Clean Marine Energy; Mr Ed Washburn, SVP, Pasha Hawaii; Mr Abu Bakar

## Networking with ship owners

With key customers in Europe, Keppel Offshore & Marine (Keppel O&M) took the opportunity to strengthen its network with Greek ship owners and showcase its extensive range of solutions through Posidonia 2018, a major exhibition organised in Athens, Greece.

Held from 4 to 8 June 2018, the

biennial event saw participation from over 2,000 exhibiting companies and 23,000 visitors from around the world.

It also featured a series of conferences and seminars which delved into pertinent topics such as the global sulphur cap which will be effective in 2020, and country-related themes which

could have a significant impact on the industry.

Posidonia is a leading shipping exhibition and provides direct access to Greek shipping and the owners of the largest fleet under the control of any one national group.



Posidonia 2018 was attended by Dr Lam Pin Min (fourth from right), Senior Minister of State, Ministry of Transport and Ministry of Health, as well as senior management from Keppel O&M

# Interview with the CEO

*OffshoreMarine* speaks to Mr Chris Ong, CEO of Keppel Offshore & Marine (Keppel O&M) to gain insight into his experience at Keppel O&M, outlook on the business, as well as his views on work, life and the world.

## **Q: How would you describe your journey in Keppel?**

Exciting, intense and fulfilling. I had to learn a lot very quickly. Keppel is an organisation that provides you with opportunities to stretch and grow professionally, regardless of seniority and experience.

I first joined Keppel FELS' Commissioning department in 1999. In my second year with the company, I travelled with two other colleagues to our Keppel AmFELS yard in the United States (US) to commission the Q4000 semisubmersible (semi) rig. This was a challenging and mammoth project but there was tremendous satisfaction when it was completed. I felt an even greater sense of achievement when the rig was utilised in the Deepwater Horizon oil spill recovery.

## **Q: Can you share your experiences on what it means to be a Keppelite?**

I think the Keppel core values, such as *Can Do!*, Customer Focus, and Agility & Innovation, are very apt. When I was tasked with the project in the US, I had to absorb a lot in a short period of time and adapt to working in a different culture, with different infrastructure. Thankfully, my seniors imparted invaluable knowledge and generously shared their



Mr Chris Ong, CEO of Keppel O&M

experiences to ease my learning curve. Looking back, it was indeed a project that helped set the stage for my engineering career.

On my next assignment, I flew to Paris for a technical discussion with a potential customer on a project for Azerbaijan, the TPG500 jackup rig. I remember crossing paths with one of our competitors who was exiting the contract, and they wished our team a much-needed "Good Luck". Despite knowing the difficulties that came with the project, our

team remain undeterred. Armed with our knowledge and *Can Do!* spirit, we were able to convince them that we could execute the project well. Even though our team was relatively smaller compared to those of our competitors, we completed the project successfully, and they continued engaging us for additional work.

## **Q: How has Keppel O&M grown over the years?**

Keppel O&M has grown exponentially in many areas since it was established in 2002. We have

increased our product range and capabilities significantly, and are continually proposing solutions for the market.

We have also adopted a more broad-based and bottom-up approach, which I think is a result of the various campaigns to build a culture of ownership, whether in innovation, quality or safety. Just like our safety journey, we have instilled in our people both a proactive and forward-looking mind-set.

The fundamentals of our execution excellence, namely delivering safely, on time and on budget, remain unchanged. But we have taken it a step further to anticipate what the market needs in order to bring the company to the next level.

**Q: Can you share with us the challenges you have to deal with as CEO?**

The nature of the O&M business is cyclical. In fact, I joined the company during the industry downturn, which has helped me in managing such periods as well as how to prepare for the upturn and ride the wave when it returns. Of course, there are differences between each cycle and this time, we do see some structural changes.

Over the last year, I have been focusing on ensuring that our business is sustainable, that our operations are streamlined and at the same time, ready for the market recovery.

Economic sustainability also means

diversifying into adjacent areas and staying relevant to Keppel Group as a whole. Keppel is committed to providing solutions for sustainable urbanisation. In line with this goal, Keppel O&M's innovative energy solutions, including our gas strategy, complement the Group's mission. We are also exploring opportunities in a wide variety of markets such as renewables and floating infrastructure.

**Q: What are some of the new technologies that interest you and can be applied to Keppel O&M?**

Digitalisation, artificial intelligence and the Internet of Things are important not just for improving our products, and increasing operational efficiency, but also for attracting the new generation of talent with the latest technology.

We must adopt and adapt technology, or risk being disrupted. We are developing the yard of the future and digitalised products such as autonomous vessels. We are talking to an array of companies in the digital space, e-commerce, and car manufacturers, among others, to discuss how we can apply the latest technology in our businesses. Hence, our labour workforce composition will see a fundamental change. In terms of products, the sky is the limit.

**Q: Where do you see Keppel O&M in the long-term future?**

Business and service models will change. We want to be able to step into the role of business developers and help string projects together, thereby expanding

our playing field. The first cut is about asset management. Taking a stake in some of these projects is not new to us. It is about how we, as a group, take a bigger pie of the potential recurring income. Beyond that, we are also looking at synergies across the Keppel Group to provide solutions for sustainable urbanisation, including providing floating infrastructure to serve remote regions which are developing and therefore would require more energy.

Looking over a 10-year horizon, I expect that we will be playing in many different aspects as a solutions provider in energy generation. Keppel O&M will continue to stay relevant to the industry in terms of our Engineering, Procurement and Construction strength and on top of that, be a significant contributor in terms of various renewable solutions. We could also be engaged in deep sea mining and activities channelled around our adjacent capabilities.

Looking ahead, our yards will be driven by new technologies, which would help strengthen our operational capabilities, connectivity and productivity. As we make use of digitalisation to significantly improve the way we work, new skills will be required. This means bringing in more robotic and software engineers to help facilitate this change.

*Continues on page 22...*

Continued from page 21.

**Q: On a more personal note, how do you manage work-life balance as a father to two children?**

I think in today's world, it is more about work-life harmonisation. We have the tools that enable us to multi-task while being in one place. Keppel is a task-oriented organisation so there can be busy periods when work takes priority but also times when family comes first. Having a good team around you is vital so that you can balance your commitments, knowing that there are always capable hands to keep things running smoothly.

**Q: What do you do in your free time?**

I enjoy swimming. It is also an activity that allows me to bond with the kids. Another common activity is watching the Harry Potter movies on TV as my kids are huge fans. I make it a point

to have dedicated time with the family, whether on vacations or even staycations. We don't need to go far to enjoy ourselves, spending quality time together is the most important.

**Q: What is your favourite food?**

I like local food, especially Char Kway Teow. I enjoy having late night roti prata or catching up with friends over supper. It is more about having good company than it is about the food.

**Q: What is your favourite book / reading material?**

I grew up reading military books such as Tom Clancy's but now I am reading more board papers instead (laughs)! Actually, I find myself reading more autobiographies as it gives you a different perspective. My favourites include the late Mr Lee Kuan Yew's books.

**Q: What would you say to new talent joining Keppel?**

Keppel is ideal for those who seek challenges and diversity, because we can offer a variety of different jobs within the group. As illustrated by my own career path, there are many opportunities for growth. I would encourage young Keppelites not to just look at the short term, or at the remuneration alone, but to consider the long-term career path that the company offers.

Beyond the tangible benefits, we also look to motivate our employees by encouraging them to venture into exciting new markets and challenging them with large-scale projects. This would enable them to increase their skills, further develop themselves and step up in their careers.

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## Improving skills and qualifications

As part of employee development, Keppel Offshore & Marine actively sponsors its employees to upgrade their skills and qualifications.

Two sponsored employees from Keppel Shipyard, Mr Han Li Muang, a Foreman, and Ms Siti Nabilah Bte Abdul Kareem, a Technical Associate, recently graduated from the Institute of Technical Education.

Mr Han spent two years balancing work and studies to obtain his

Higher Nitec (National Institute of Technical Education Certificate) in Marine & Offshore Technology. His hard work was rewarded with a Certificate of Merit in the Gold Course Medal for being in the top 5%. Ms Nabilah joined the Work-Learn Technical Diploma programme to get work experience after getting a Nitec in Mechanical Technology at the same time.

They received their certificates on 3 July 2018 from Minister for

Education, Mr Ong Ye Kung, the guest of honour at the ITE graduation ceremony.



Ms Low Khah Gek (center), CEO of ITE presents the Certificate of Merit in the Gold Course Medal to Mr Han Li Muang from Keppel Shipyard (left)

# Strong finish by KRC Dragons

To promote teamwork and encourage a competitive spirit, Keppel regularly participates in external competitions for various sports such as bowling and

dragonboat. Over the past few months, Keppelite Recreation Club (KRC) Dragons represented the Keppel Group in two races and achieved outstanding results.

KRC Dragons also participated in the DBS Marina Regatta, and sent two teams for the Mix and Open categories. The competition was held over two weekends on 26-27 May and 2-3 June, where teams participated in 500-metre and 200-metre races respectively.



The KRC Dragons achieved outstanding podium finishes at the Jurong Island Race held at Bedok Reservoir on 28 July 2018

On 28th July 2018, KRC Dragons sent three teams for the Jurong Island Race, an annual race held by JTC Corporation for companies operating in Jurong Island. The teams participated in the Open, Mix and Women categories, and raced over a distance of 200 metres. Despite the searing heat, all three teams achieved podium finishes. In the Mix category, the team achieved an outstanding 1st runner up position.

In the face of intense competition from the likes of traditional powerhouses such as DBS and ExxonMobil, KRC Dragons stuck to their strategy and maintained their consistency to achieve a commendable semi-final finish for both races.

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# Clean sweep at the Amazing Maritime Challenge

Keppel teams secured the top three places in the corporate category of the Amazing Maritime Challenge, a game-based event organised by the Maritime and Port Authority of Singapore.

Held on 22 April 2018, more than 1200 participants formed teams of two to complete a series of tasks and quizzes related to the maritime while navigating around Singapore in under five hours.

It was an impressive showing by Keppel as the team from Keppel's Offshore Technology Development

arm, named Clefairy, won the first prize in the corporate category with a score of 975 points while another team from Keppel FELS

called pirate princes came in second. The team from Keppel Shipyard, Go Riders, secured third place.



The teams from Keppel received their prizes from President for the Association of Singapore Marine Industries Abu Bakar Bin Mohd Nor (third from left) who is also the MD (Gas and Specialised vessels), Keppel Offshore & Marine

# Celebrating as *OneKeppel*

Over 200 Keppelites participated in the Keppel 50 Charity Run in celebration of Keppel Corporation's 50th anniversary. To commemorate this occasion, Keppel made a \$1 million donation to President's Challenge 2018. Guest-of-honour President Halimah Yacob received the donation on behalf of President's Challenge.



At the break of dawn on 7 July 2018, Keppelites from across the Group gathered at the opposite ends of Singapore, eagerly anticipating the start of the Keppel 50 Charity Run. Organised by Keppelite Recreation Club (KRC), the 50 km charity run is one of the Company's key events to commemorate Keppel Corporation's golden jubilee.

The run, which was conducted in a relay format, had two routes – the western route started from Keppel Offshore & Marine (Keppel O&M) at Gul Road and included the headquarters of Keppel Telecommunications & Transportation; whereas the

After a gruelling 50 km relay run, Keppelites from across the Group crossed the finish line together



Dr Lee Boon Yang (second from right), Chairman of Keppel Corporation, presented a cheque of \$1 million to President Halimah Yacob (centre), who received the donation on behalf of President's Challenge at the Keppel 50 Charity Run. Witnessing the cheque presentation were Mr Loh Chin Hua (rightmost), CEO of Keppel Corporation and Chairman of Keppel O&M, Mr Chew Hock Yong (second from left), Permanent Secretary, Ministry of Social and Family Development, and Mr Sim Gim Guan (leftmost), CEO of National Council of Social Service



Mr Chris Ong (5th from left), CEO of Keppel O&M, flagged off runners taking the western route, which started at Keppel O&M's headquarters



eastern route flagged off at the Keppel DHCS plant at Changi Business Park and included Bugis Junction Towers, where Keppel Land and Keppel Capital are located.

The two routes converged at Keppel Bay Tower, the headquarters of Keppel Corporation.

### GIVING BACK

To commemorate this special occasion, Keppel Corporation made a \$1 million donation to President's Challenge 2018 in support of its programmes to empower vulnerable groups in Singapore. Dr Lee presented the cheque of \$1 million to President Halimah Yacob, who received the donation on behalf of President's Challenge at the event.

In his address, Dr Lee said, "Over

the years, Keppel has grown, expanded overseas, and diversified into a multi-business company, providing solutions for sustainable urbanisation. However, we continue to cherish our heritage and roots as a ship repair yard, on the Southern waterfront of Singapore.

Added one of the runners, Liu Yao, Engineer at Keppel Singmarine, "While the run was tiring, the sense of collective pride in crossing the finish line together with other Keppelites made it all worthwhile."

### RESTORING A PIECE OF HISTORY

The Keppel 50 Charity Run also saw the unveiling of the historic King's Dock plaque by Dr Lee and Mr Loh, witnessed by President Halimah. The plaque was laid over a century ago, to commemorate the opening of King's Dock in 1913 by Sir Arthur Henderson Young,



The historic King's Dock plaque, which was laid over a century ago, had been restored and was unveiled during the event

then Governor and Commander in Chief of the Straits Settlements. King's Dock was at that time the second largest dock in the world.

The plaque was removed during the redevelopment of Keppel Bay close to 20 years ago. To mark Keppel's golden jubilee, the marble plaque has been restored and will be displayed near King's Dock, to share with the public the historical significance of this location.

## Educational visit

On 11 May 2018, Keppel's shipyard in Brazil, BrasFELS, hosted 42 students from Alexina Lowndes Municipal School which is located in the Bonfim neighborhood in Angra Dos Reis. It was the second educational visit of the yard's Teach-it-Forward Programme.

Accompanied by teachers, Marília Rodrigues and Lívio Périssé, the students were warmly welcomed

by the shipyard's employees, who shared their professional experiences and the importance of studies for success. The students were also brought on a tour and learned more about BrasFELS' facilities and projects.

At the end of the session, student Sarah Vitória da Silva said, "The organisation of the yard and the passion of the shipyard's

employees, especially with safety, caught my attention." Another student Yuri Borges Oliveira commented that he would bring the collective strength core value of the yard to the school. "At school, people are not so united; the learning that I will take there is the group practice and collective work," he said.

# Making a difference



Families supported by Care Corner participated in financial literacy games designed by finance officers from across the Keppel Group

Keppel is committed to making a difference in the communities wherever it operates through its social programmes and volunteerism efforts both in Singapore and abroad.

On 9 June 2018, Keppel Volunteers organised a financial literacy carnival for underprivileged families supported by Care Corner (Admiralty). The skills-based volunteer initiative brings together finance staff from across the Group to impart financial literacy to beneficiaries through interactive games, while promoting family cohesiveness.

Daniel Xu, Assistant Manager, Group Control & Accounts, Keppel Corporation, said, "This experiential learning approach is effective, fun and engaging. It was meaningful to see how our sharing of financial knowledge could empower the beneficiaries in making important financial decisions in their daily lives."

Separately, on 6 June 2018, volunteers from Keppel Shipyard brought close to 100 children from Care Corner (Woodlands) on an excursion to the Singapore Science Centre.

"The aim of this visit was to nurture in students an interest in various science disciplines. The students were visibly excited as they interacted with the different exhibits and asked many questions on how the various mechanisms worked. I'm glad to see that we have accomplished our mission today!" reflected Leslie Lim, HR Executive, Keppel Shipyard.

On 29 June 2018, interns from across the Group organised a robotics workshop for children from Care Corner (Toa Payoh). Under the guidance of volunteers, the children built their very own Dragster race cars that were pitted against each other in a thrilling race!

Separately, in celebration of Mother's Day, volunteers from Keppel Sea Scan visited United Medicare Centre at Elizabeth Drive on 18 May 2018. Volunteers recreated a shopping mall experience for residents of the nursing home who 'shopped' for necessities such as coffee and medicated oil sponsored by Keppel Sea Scan.

On 11 June 2018, volunteers from Keppel Offshore & Marine also engaged children from FosterConnections@MCRYC in a terrarium-making workshop.

Keppel Volunteers' overseas chapter in China continued to organise meaningful activities in June, making a positive impact on communities.

Volunteers from Keppel Nantong Shipyard visited an old folk's home on 15 June 2018 to celebrate the Dragon Boat Festival with the elderly.

To celebrate the occasion, they made rice dumplings, which involved wrapping rice, meat, dates and other ingredients in bamboo leaf packets.

The volunteers, who started with little experience in wrapping dumplings, slowly picked up speed under the patient guidance of the elderly. Together, they made 100 dumplings in just two hours!

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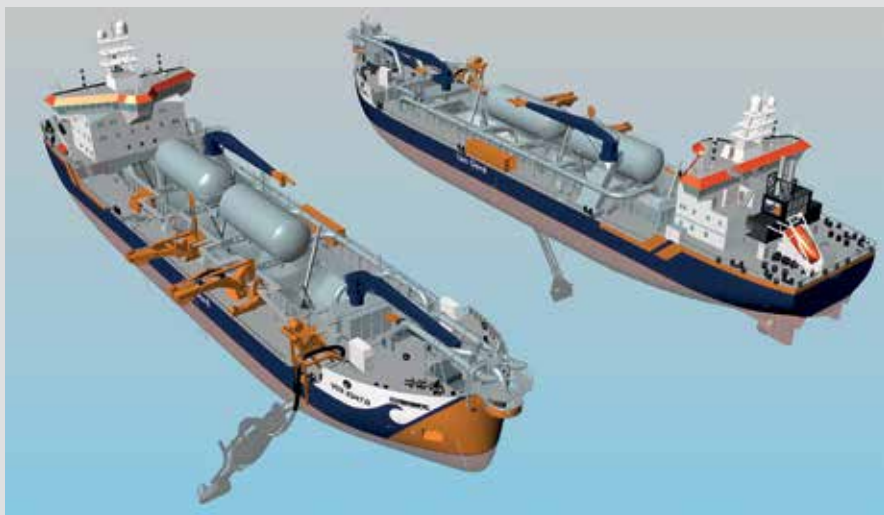
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# Keppel to build two dredgers for Van Oord



Equipped with dual-fuel systems capable of running on LNG, the two dredgers to be built by Keppel O&M for Van Oord cater to increasing industry demands to adopt LNG as a marine fuel

Keppel Offshore & Marine's (Keppel O&M) wholly-owned subsidiary, Keppel Singmarine, announced on 16 May 2018, new contracts secured from Van Oord to build two high-specification Trailing Suction Hopper Dredgers (TSHDs).

The two dredgers are expected to be completed in 4Q 2020 and 2Q 2021 respectively. As part of the contracts, Van Oord has an option to order a third dredger to be exercised within one year.

When completed, the two TSHDs will each have a hopper capacity of 10,500 cubic meters. Built to the requirements of classification society, Bureau Veritas, the two dredgers will be equipped with dual-fuel systems capable of running on LNG.

Mr Abu Bakar, Managing Director (Gas & Specialised Vessels), Keppel O&M, said, "We are pleased to be awarded these contracts by our new partner Van Oord. Keppel is currently constructing five other dredgers, and we are able to build on our experience and capabilities to meet Van Oord's needs. This new order for dredgers of high specifications attests to our strength as a specialised shipbuilder.

"By leveraging our design and construction capabilities, we are able to provide customers from different industries with tailored solutions for ships of various specifications and functions."

Mr Jaap de Jong, Staff Director, Ship Management Department at Van Oord, said, "We are pleased to

work with Keppel on these modern and environmentally-friendly dredgers which will strengthen our mid-class dredger fleet as well as our presence in the region. Last month we already launched our first LNG powered crane vessel. The TSHDs will be the first LNG hopper dredgers in our fleet. We look forward to this partnership with Keppel as we adopt LNG as a marine fuel to reduce our global carbon footprint."

TSHDs are mainly used for dredging loose and soft soils such as sand, gravel, silt or clay. The dredged material can be deposited on the seabed through bottom doors or discharged through a floating pipeline to shore and used for land reclamation.

Van Oord is a leading international contractor specialising in dredging, marine engineering and offshore projects (oil, gas and wind). Its modern fleet consists of more than a hundred vessels and other specialised equipment.