

OFFSHOREMARINE

A newsletter of Keppel Offshore & Marine

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**STRENGTHENING
PARTNERSHIPS FOR
FUTURE GROWTH**

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With gas as an important market for the future, Keppel O&M is gearing up to be an industry leader offering an extensive gas strategy that spans the gas value chain, including the conversion of an existing Moss LNG Carrier, the Hilli, into a Floating Liquefaction Vessel

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Resilient amidst headwinds

Keppel Offshore & Marine (Keppel O&M) continues to stay resilient amidst the challenges facing the industry. Mr Loh Chin Hua, Chairman of Keppel O&M and CEO of Keppel Corporation, discussed the Group's strategic developments and performance at the Company's 1Q 2017 results conference and webcast on 20 April 2017. *OffshoreMarine* reproduces highlights of his speech.

TAPPING GROWTH IN SUSTAINABLE URBANISATION

As we had cautioned at the FY 2016 results announcement in January, despite the increased optimism in the market following the rebound in oil prices, the offshore business continues to face very challenging conditions. This is due to, among other factors,

the oversupply of rigs and support vessels. It will take some time before the industry fully recovers.

Notwithstanding the headwinds, the Keppel Group has remained resilient, underpinned by our multi-business strategy, with different engines kicking in to steady the Group.

Rapid urbanisation, especially in Asia, is creating strong demand for energy, infrastructure, clean environments, high quality homes, offices and retail developments, as well as connectivity – needs for which the Keppel Group has been providing a range of solutions.

Continues on page 4...



Keppel FELS signed a Heads of Agreement with Borr Drilling for the novation of Transocean's five newbuild jackup contracts to Borr Drilling

Continued from page 3.

While some of the industries that our businesses operate in may have their own cycles, sustainable urbanisation will provide the Keppel Group with many years of secular growth.

BUSINESS UPDATES

Amidst the continuing downturn, Keppel O&M managed to break even. The fall in net profit was due to the significantly lower volume of work. The Division, with contributions from associates, continued to make a profit. This shows the importance of the rightsizing efforts that Keppel O&M has embarked on since early 2015.

To keep our O&M Division lean and fighting fit, our rightsizing efforts have continued. We announced in January that we had mothballed two overseas yards and were in the process of closing three supporting yards in Singapore.

We have ceased operations at our yard at Shipyard Road and returned it to JTC Corporation at the end of March. The closure of the other two yards will be announced later in the year.

To further optimise operations and rationalise our global network of yards, Keppel O&M has entered

into a term sheet agreement to divest Keppel Verolme, our shipyard in the Netherlands, to Damen Shiprepair & Conversion B.V.

We will continue to seize opportunities in Europe and the North Sea through our network of yards in Singapore and around the world.

In the first quarter, Keppel O&M further reduced its global direct workforce by about 1,250 or 6% compared to the previous quarter, through natural attrition, early termination of contracts and retrenchments. Since the start of



Keppel Shipyard is on track to deliver Golar Hilli, the first-of-its-kind floating liquefaction conversion in the market, in mid-2017

Other projects we are on track to deliver shortly include the installation and integration of topside modules for a newbuild Catcher FPSO from BW Offshore and a newbuild semisubmersible for the State Oil Company of the Azerbaijan Republic. In mid-2017, we are also scheduled to deliver Golar Hilli, the first-of-its-kind floating liquefaction vessel conversion in the market.

*Mr Loh Chin Hua,
Chairman of Keppel O&M and
CEO of Keppel Corporation*

2015, we have reduced our global direct workforce by close to 18,000 or about 49%. Following the latest reductions, the headcount in Keppel O&M is approaching a steady state that is appropriate for the level of work in our yards.

Nevertheless, we will actively monitor market conditions as well as explore ways to achieve further cost savings and ensure that Keppel O&M remains profitable despite the reduced topline.

KEY DEVELOPMENTS

Keppel O&M's net orderbook as at end-March 2017 stood at \$3.5 billion, excluding the projects for Sete. Our yards continue to execute the projects on our books safely, on time and on budget, and with the quality that our customers have come to expect from Keppel.

Early this year, Keppel Shipyard delivered a Floating Production Storage and Offloading (FPSO)

vessel to Yinson Production which is on charter to ENI Ghana Exploration & Production.

In Brazil, our BrasFELS yard has marked the sailaway of the first of two Replicante projects, FPSO P-66, for delivery to Tupi BV, a consortium represented by Petrobras. Our workscope for the projects included the fabrication, integration, testing and commissioning of topside modules. Meanwhile, work on the second Replicante, FPSO P-69, is progressing smoothly.

Other projects we are on track to deliver shortly include the installation and integration of topside modules for a newbuild Catcher FPSO from BW Offshore and a newbuild semisubmersible for the State Oil Company of the Azerbaijan Republic. In mid-2017, we are also scheduled to deliver Golar Hilli, the first-of-its-kind floating liquefaction vessel conversion in the market.

Amidst the challenges facing the industry, we continue to work closely with our customers to seek win-win outcomes. We have reached an agreement with Fecon International Corp on the further deferment of its three KFELS B Class jackups, originally slated for delivery this year, to 2H 2019.

Keppel FELS has also entered into a Heads of Agreement with Borr Drilling for the contracts of Transocean's five jackup rigs to be novated to Borr Drilling. Under the

new agreement, Borr Drilling will take over the contracts, make a down payment of US\$275 million and undertake the remaining payment instalments to Keppel FELS. The delivery of the first three rigs has been brought forward to 2017 and 2018, while the remaining two rigs will be delivered in 2020.

The deal, beyond improving Keppel O&M's cashflow, is a testament to the strong demand for Keppel's proprietary rigs, even in the present market conditions.

SEIZING OPPORTUNITIES IN NEW MARKETS

Keppel O&M is pushing into new markets and revenue sources. Gas will be an important market of the future, and we are priming Keppel O&M to be an industry leader with an extensive gas strategy that spans the value chain.

We are actively pursuing opportunities in small-scale liquefied natural gas vessels with our customers and partners. We see many opportunities in this space, especially where Keppel-built carriers and regasification units can be deployed alongside small gas-fired power units.

We are also re-purposing our offshore technology for applications in other areas including floating infrastructure assets.

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IN CONVERSATION

OffshoreMarine shares highlights of the 1Q 2017 results Question & Answer session, where senior management addressed issues and concerns of the financial community.

Q: Why did O&M revenue come down so much in 1Q 2017?

LCH: The lower O&M revenue was due to lower volume of work. As the volume of work was low, the gross operating profit was not sufficient to entirely cover our fixed costs. This also demonstrates the importance of our rightsizing efforts, which we have been executing since 2015.

Q: How many Singaporeans have been let go in your rightsizing

efforts since 2015 and in 1Q 2017?

Are you expecting further staff reduction in the next quarter?

LCH: For the first quarter of 2017, Keppel O&M reduced its workforce by 1,246 or by about 6% from the previous quarter. We do not give a breakdown of the different nationalities, and I think it is not pertinent as far as our results are concerned. What is more important is that we are approaching a steady state. But of course, we will have to monitor this closely to ensure that our workforce is appropriately sized for the work that we can see going forward.

Q: How has your order inflow in the O&M Division been so far this year?

CO: For the order inflow in 1Q 2017, we have Jan De Nul exercising its option for the third dredger. Moving forward, the team is working hard to pursue other opportunities in terms of liquefied natural gas, specialised vessels, Jones Act vessels and also repurposing our offshore technology for non-drilling applications.

LCH – Mr Loh Chin Hua,
CEO of Keppel Corporation

CO – Mr Chris Ong,
Acting CEO of Keppel Offshore & Marine



Keppel Singmarine strengthens its track record in specialised vessels with the execution of dredger contracts from Jan De Nul

Leadership renewal



Mr Chris Ong

Mr Chris Ong, MD of Keppel FELS, has been concurrently appointed Acting CEO of Keppel Offshore & Marine (Keppel O&M) with effect from 1 April 2017.

Mr Ong succeeded Mr Chow Yew Yuen, who retired on 31 March 2017 after 36 years of service with the Keppel Group, during which he had served as, among others, President of Keppel AmFELS and President of Keppel O&M USA.

Mr Loh Chin Hua, CEO of Keppel Corporation and Chairman of Keppel O&M, said, "Chris is part of the talent pool which we have been nurturing for leadership succession at Keppel O&M. He has been with the Keppel Group for 17 years, and has contributed significantly to building Keppel FELS into the global leader in the offshore business that it is today.

"On behalf of the Board of Keppel O&M, I welcome Chris in his



Mr Paul Tan

new role. I am confident that he will provide effective leadership to Keppel O&M in the next stage of the company's development."

Mr Ong, 42, joined Keppel FELS in 1999, and has held a range of key appointments in Keppel FELS, including GM (Engineering), Acting ED (Operation), ED (Commercial) and Deputy MD, before being appointed MD of Keppel FELS on 5 July 2016.

Apart from his role in Keppel FELS, Mr Ong is the Chairman of Bennett Offshore and Keppel LeTourneau USA, Bintan Offshore Fabricators as well as a director of various subsidiaries or associated companies of Keppel O&M.

Mr Ong is also a board member of the Institute of Technical Education Board of Governors, and a member of the Association of Singapore Marine Industries, Workplace Safety & Health

Council Marine Industries Committee, and U EnTech Steering Committee.

Mr Ong has a Bachelor and Master Degree in Electrical and Electronics Engineering from the National University of Singapore. He is a Chartered Engineer, a Fellow of the Institute of Marine Engineering, Science and Technology, and a member of the American Bureau of Shipping.

In addition, Mr Paul Tan, Group Controller of Keppel Corporation, has been concurrently appointed as CFO of Keppel O&M with effect from 1 April 2017.

Mr Tan joined the Keppel Group in 1980 and has held various management positions within the Group. Since 1988, he has been responsible for the Group Accounts for Keppel Corporation.

Mr Tan succeeded Mr Wong Ngiam Jih, who retired as CFO of Keppel O&M on 31 March 2017 after over 40 years of service with the Keppel Group.

Strong execution in Brazil



P-66, the first of the Replicante series of FPSO units, left BrasFELS for deployment in the Lula Sul field, Santos Basin, Brazil

Focusing on execution excellence, BrasFELS has delivered a number of milestone projects for Brazil's offshore oil and gas industry. In the first quarter of 2017, the shipyard added to its strong track record with the departure of the Floating Production Storage and Offloading (FPSO) vessel P-66 from its facilities, as well as the delivery of the well-intervention vessel Siem Helix I.

FPSO P-66

On 4 February 2017, P-66, the first of the Replicante series of FPSO units, left BrasFELS to be deployed in the Lula Sul field in Santos Basin, Brazil.

FPSO P-66 is BrasFELS' project for Tupi BV, a consortium comprising

Petróleo Brasileiro S.A. (Petrobras), BG E&P Brasil (a subsidiary of Royal Dutch Shell plc), and Petrogal Brasil.

BrasFELS was engaged for two Replicante projects, P-66 and P-69. The shipyard's work scope for the projects includes the fabrication, integration, testing and commissioning of topside modules. The Replicante FPSOs are a series of FPSOs of similar design and specifications ordered by Petrobras for the Santos Basin pre-salt region.

Mr Kwok Kai Choong, CEO and President of Keppel FELS Brasil, said, "We are proud to partner Petrobras on the Replicante projects and deliver the FPSO P-66

to their highest satisfaction. It will add to Keppel's track record of delivering more than 30 safe and successful major projects for Brazil. Work on the second Replicante FPSO, P-69, is progressing well and we look forward to continuing to work with Petrobras as their choice shipyard in tapping Brazil's vast oil and gas resources."

FPSO P-66 has a production capacity of 150,000 barrels of oil per day and six million m³ of gas per day. It also has a storage capacity of 1.6 million barrels of oil.

BrasFELS has built up extensive capabilities and experience in FPSO projects over the years. Including FPSO P-66, the shipyard has completed seven FPSO projects since 2010.

SIEM HELIX I

Siem Helix I arrived at BrasFELS on 26 December 2016 for upgrading works. The well-intervention vessel is the shipyard's first project for Helix Energy Solutions.

The work scope comprises the engineering, fabrication and installation of a bulk transfer system as well as a new mezzanine deck. In addition, the shipyard undertook the zone reclassification of the mud pit room.

Siem Helix I departed from BrasFELS on 8 March 2017. It is slated for operations in Santos Basin, located within Brazil's pre-salt region.

Keppel Shipyard to deliver twelfth FPSO to BW Offshore

Keppel Shipyard is on track to deliver a Floating Production Storage and Offloading (FPSO) vessel to BW Catcher Limited, a wholly-owned subsidiary of BW Offshore.

On 28 April 2017, Mrs Josephine Teo, Singapore's Senior Minister of State, Prime Minister's Office, Ministry of Foreign Affairs & Ministry of Transport, graced the naming ceremony of BW Catcher, at Keppel Shipyard.

SMS Teo said, "My congratulations to the management and staff of Keppel and BW Offshore for your successful collaboration on the BW Catcher! This project is testament to the capabilities of Singapore's offshore and marine sector. I hope there will be many more collaborations that boost the strength of Maritime Singapore."

Upon its completion, BW Catcher will be on a 7-year fixed term and 18 years of options contract with

Premier Oil and will be deployed to the Catcher Field located in Central North Sea, UK. Keppel Shipyard's work scope on the FPSO include the installation and integration of topside modules. BW Catcher is scheduled for sailaway from the shipyard in the next few months and is on track to achieve its first oil in 2017.

Mr Chris Ong, Acting CEO of Keppel O&M, said, "The successful fast-track delivery of BW Catcher is an example of strong team work, project management and experience. I am glad that we were able to meet our customer's needs. Our reliability and expertise in executing FPSO projects allows us to continue to win the trust and confidence of our customers."

Mr Carl Arnet, CEO of BW Offshore added, "Having worked together on eleven other projects previously, Keppel has proven to be a reliable partner. I would like to thank the project teams from BW Offshore and Keppel for the excellent work on this project. We are looking forward to the final completion to our expectations. We are confident that the FPSO will perform well in the Catcher Field and bolster the oil output in the North Sea."



Keppel Shipyard is on track to deliver its twelfth FPSO, BW Catcher, to BW Offshore. Upon its completion, BW Catcher will be deployed to the Catcher Field located in Central North Sea, UK

Novation of Transocean rigs to Borr Drilling

Keppel FELS, a wholly-owned subsidiary of Keppel Offshore & Marine (Keppel O&M), has entered into a Heads of Agreement with Borr Drilling Limited of Bermuda (Borr Drilling), with the approval of Transocean, whereby the construction contracts for the five jackup rigs currently being built by Keppel FELS for Transocean will be novated to Borr Drilling.

The transaction is subject to all three parties executing definitive agreements and satisfying formal closing conditions. The completion of transaction is expected to take place before end-May 2017.

In 2013, Transocean had ordered five KFELS Super B Class jackup rigs from Keppel FELS for US\$1.1 billion and made a 20% down payment. Under the new agreement, Borr Drilling will take over the contracts and undertake the remaining payment instalments to Keppel FELS. The price for each rig is US\$216 million, compared to the original price of US\$219 million. Borr Drilling will also make a down payment of US\$275 million.

The delivery dates of the five rigs were originally scheduled between 2016 and 2017, but had been deferred by Transocean to

2020. The first three rigs will now be delivered between 2017 and 2018, while the remaining two rigs will be delivered in 2020. This will enable Keppel to improve cash flow and minimise risks of the projects.

The deal is a testament to the reliability of and strong demand for Keppel's proprietary KFELS Super B Class rigs, even in the present challenging market conditions.

The KFELS Super B Class rigs are designed to operate in 400 ft water depth and drill to 35,000 ft.

Divestment of Keppel Verolme

Keppel Offshore & Marine (Keppel O&M) has entered into a term sheet agreement with Damen Shipyards Group (Damen) for the sale of its shipyard, Keppel Verolme.

The proposed sale comes after a strategic review by Keppel O&M and is part of the company's efforts to optimise its operations and rationalise its global network of yards.

Keppel O&M continues to see opportunities in the offshore oil and gas market in Europe and the North Sea, and will service these markets through its

network of yards in Singapore and globally.

Keppel Verolme is situated in Rotterdam, the Netherlands, and has about 250 employees. Damen intends to continue activities in the shipyard with the current employees of the yard.

A notification of the proposed transaction has been filed with the Dutch Authority for Consumers & Markets on 10 April 2017. The parties will work towards finalising definitive agreements, and the completion of the transaction will be subject to closing conditions and the receipt of relevant approvals.

The targeted timeline to close the transaction is by the end of 2Q 2017.



Keppel O&M has entered into a term sheet agreement to divest Keppel Verolme in the Netherlands

Clockwork operations

Living up to its reputation as a specialised shipbuilder, Keppel Singmarine achieved steady progress for multiple projects in the first quarter of 2017.

STRIKING START

On 15 March 2017, a strike steel ceremony for the three Trailing Suction Hopper Dredgers (TSHDs) that Keppel Singmarine is constructing for the Jan De Nul

Group was held at Keppel Nantong Shipyard.

Built to Jan De Nul's design requirements, the TSHDs will be able to dredge to a maximum depth of 27.6 metres, and have a hopper capacity of 3,500 cubic metres.

Jan De Nul, a long-standing customer of Keppel O&M, has

commissioned the Group for newbuild dredger projects and ship repairs.

KEEL LAYING FOR DUAL-FUEL TUGS

On 12 April 2017, Keppel Singmarine laid the keel for two 65-tonne Azimuth Stern Drive dual-fuel tugs that it is building for Keppel Smit Towage and Maju Maritime. The strike steel ceremonies for the two dual-fuel tugs were held earlier on 1 December 2016 and 21 February 2017 respectively.

Developed by Keppel, the dual-fuel tug design clinched the Outstanding Maritime R&D and Technology Award at the 2015 Singapore International Maritime Awards. In addition to conventional diesel fuel, Keppel's dual-fuel tugs are able to operate on cleaner liquefied natural gas (LNG), offering increased fuel consumption efficiency and operational flexibility.



Management from Keppel Singmarine, Jan De Nul and Bureau Veritas celebrated the strike steel milestone of the three Trailing Suction Hopper Dredgers at Keppel Nantong Shipyard



Celebrating the strike steel ceremony of the dual-fuel tugs are Mr Abu Bakar (tenth from right), MD, Keppel Singmarine, together with key members of the project team

Optimism at Sea Asia



Minister Khaw Boon Wan (third from right), Minister for Transport and Coordinating Minister for Infrastructure, being briefed by Mr Loh Chin Hua (second from right), Chairman of Keppel O&M and Mr Chris Ong (second from left), Acting CEO of Keppel O&M, on Keppel's suite of solutions

As part of its efforts to showcase capabilities and build new partnerships, Keppel Offshore & Marine (Keppel O&M) participated in Sea Asia 2017, Asia's biggest maritime and offshore conference and exhibition, held at Marina Bay Sands, Singapore from 25-27 April 2017.

During the opening ceremony, Guest-of-Honour, Mr Khaw Boon Wan, Minister for Transport and Coordinating Minister for Infrastructure, noted that despite uncertainties and challenges in the maritime industry, Asia will continue to drive global shipping.

Urging Singaporean companies to ride on Asia's growth, Minister Khaw said that innovation is vital

to seizing new opportunities in the industry.

Maritime industry leaders also agreed that there is still optimism and opportunities in the industry if companies are willing to scale to the right size, focus on innovative solutions and proactively develop competitive advantages.

Mr Michael Chia, MD (Marine and Technology) of Keppel O&M, who was one of four speakers at the Offshore Marine Forum during Sea Asia, shared, "There are always opportunities in a crisis. This is the time for us to build competitiveness to become a forerunner when there's an upswing in the market. If we're not looking at equipping ourselves

with the right strategies in this downturn, then we'll not be ready to take advantage of the situation when the market turns around."

Adding that Keppel sees opportunities in the gas business, he said, "Gas in the form of LNG is driving new demand for power consumers, transportation, small scale LNG, breakbulk LNG and LNG bunkering – we are beginning to see more and more of these."

Held in conjunction with the Singapore Maritime Week, the sixth edition of Sea Asia also saw Keppel O&M showcasing its product offerings and solutions at its booth.

Showcasing LNG solutions

Keppel Offshore & Marine (Keppel O&M) joined over 25,000 delegates and 600 exhibitors at Gastech, the largest gas and Liquefied Natural Gas (LNG) exhibition in the world, held 4 – 7 April 2017 in Tokyo, Japan.

Besides showcasing its suite of LNG solutions at the Singapore Pavilion, Keppel also conducted workshops on topics including its technologies and products along the gas value chain. During a cocktail reception hosted by Keppel O&M,

senior management mingled with customers, partners and associates to explore new business opportunities.

With the huge growth potential of the LNG market, Keppel O&M has been widening its solution offerings beyond its hallmark products. It is well equipped to capture a wide range of opportunities in the gas value chain with its solutions for onshore and offshore liquefaction, LNG transportation solutions, floating storage and regasification facilities, as well as newbuild vessels capable of running on LNG.



Senior management from Keppel Offshore & Marine mingled with customers, partners and associates of Gastech 2017 held in Tokyo, Japan, to explore new business opportunities in the Liquefied Natural Gas market

Strategising the way forward

Business unit leaders from across Keppel Offshore & Marine (Keppel O&M) gathered for two days on 6 and 7 February 2017 for the company's biannual strategy meeting to report, discuss and brainstorm on growing the company.

Despite the challenges Keppel O&M is facing due to the macro environment, the wealth of experience, from senior management to younger leaders, will enable the company to emerge stronger. Mr Loh Chin Hua, Chairman of Keppel O&M and CEO of Keppel Corporation, said this in his opening address.

The focus is on retaining capabilities, staying profitable, and maintaining market leadership through innovation. The downturn also presents opportunities for business units to make inroads into new markets and repurpose offshore technology for other industries. By collaborating and harnessing synergies of the Keppel Group, more comprehensive and value-added solutions can be offered, he added.

Over the two days, business unit heads also reported on the business prospects. These included opportunities for shipbuilding in the Jones Act market in the United States, providing LNG

solutions across the value chain of the growing gas market, and developing new services.



During Keppel O&M's strategy meeting, business unit leaders discussed how the company can retain capability, stay profitable and maintain market leadership in the changing business landscape

Solutions to meet growing demand for LNG as fuel

At the Singapore Maritime Week held from 24-28 April, Mr Michael Chia, MD (Marine and Technology) of Keppel Offshore & Marine (Keppel O&M) gave an interview on the growth of LNG Bunkering. *OffshoreMarine* highlights extracts of the interview here.

The liquefied natural gas (LNG) bunkering market in Asia is gearing up for growth in the next two to three years. This is largely due to the implementation of stricter environmental regulations across the globe to improve the emissions performance of shipping companies.

In particular, the International Maritime Organisation's (IMO) 2020 deadline for a fuel sulphur cap of 0.5 per cent means there is growing impetus for the industry to resolve the structural and commercial obstacles that have been hindering the widespread adoption of LNG as a marine fuel.

LNG provides a future-fit solution that is able to meet the new regulations because of its better emissions performance. Its zero sulphur content and relatively low levels of nitrogen oxides emitted mean that LNG outperforms any other conventional marine fuel on a local emissions basis, allowing the industry to be future-proofed against more demanding environmental regulations.

The abundance in natural gas supply also makes LNG a more sustainable alternative fuel – according to some estimates, the reserves for natural gas can last

much longer than the world's oil reserves, which is only expected to last for another 50 years.

The number of LNG-fuelled and LNG-ready ships in the industry is also on the rise – as of December 2016, 91 LNG-fuelled ships and another 70 LNG-ready ships are either in service or on order. The existing order book also shows a growing number of deep-sea vessels including container vessels and bulk carriers being built to LNG dual-fuel standards, illustrating how the industry is gearing up for a growth in the LNG bunkering market.

Keppel O&M is uniquely positioned to seize opportunities and offer solutions in both the demand and supply of LNG as fuel. On the supply side, we have formed a 50-50 joint venture company with Shell, called FuelNG, to begin LNG bunkering, starting with truck to ship bunkering.

On the demand side, we are at the forefront in developing vessels that can run on LNG. We have received orders to build our first two dual-fuel diesel LNG harbour tugs based on our award-winning proprietary design. The two tugs are expected to use bunkering services provided by FuelNG.

Keppel O&M's 65-tonne bollard pull LNG dual-fuel Azimuth Stern Drive (ASD) tug is jointly developed by two of its research and development (R&D) arms, Keppel Offshore & Marine Technology Centre (KOMtech), and Marine Technology Development (MTD). This design won the Outstanding Maritime R&D and Technology Award at the 2015 Singapore International Maritime Awards.

While this new technology is slightly more expensive compared to that of traditional tug boats, the higher initial capital expenditure can be offset by cheaper LNG fuel and reduced maintenance costs due to cleaner engines. Our dual-fuel tugs also offer more economical operations with efficient fuel consumption; optimised deck space that increases the safety and comfort of the crew; and ease of operations.

Smart designs were also incorporated to enhance the tug's safety and comfort. For instance, the LNG vent and piping are arranged such that the accommodation quarters in the lower deck area are situated away from the potential danger zone. The LNG fuel is also carried in containerised, type-C ISO-certified tanks on the main deck,



Keppel O&M's LNG dual fuel tug offers increased fuel consumption efficiency and operational flexibility, as well as cleaner operation



Keppel has designed a range of robust carriers from 3,000m³ to 30,000m³ that can deliver LNG along shallow water rivers, coastal areas and inter-islands



Keppel's Floating Storage and Regasification Power Plant (FSRP) integrates the storage and regasification units to provide efficient LNG power generation in a single economic package

Keppel O&M is uniquely positioned to seize opportunities and offer solutions in both the demand and supply of LNG as fuel. On the supply side, we have formed a 50-50 joint venture company with Shell, called FueLNG, to begin LNG bunkering, starting with truck to ship bunkering.

*Mr Michael Chia,
MD (Marine and Technology),
Keppel O&M*

and re-fuelling can be as simple as replacing the empty tanks with replenished ones.

Apart from newbuild designs, we also perform engine conversion and retrofitting for old diesel-powered vessels or LNG-ready ships. We have the experience in replacing marine engines and carrying out modification to internal fuel supply systems and retrofitting designs for tanks and auxiliary systems for a wide variety of vessels such as Roll-on/Roll-off

(Ro/Ro) and large containerships and bulk carriers. Our shipyard in Qatar carried out the world's first conversion of a Q-MAX LNG carrier from heavy fuel oil to a gas-burning M-Type Electronically Controlled-Gas Injection (ME-GI) system, enabling the vessel to use LNG.

To further bolster our efforts in the LNG-related business, we signed an MOU with Shell to jointly explore potential opportunities to cater to the demand for LNG as a fuel in coastal areas, inland waterways and the international marine sectors. The partnership will leverage Keppel's strength in ship building and design, and Shell's experience as a global leading energy supplier to work with potential customers to develop technical and commercial solutions for their LNG fuel needs.

With our experience as a specialised shipbuilder, Keppel has designed a range of robust carriers that can deliver LNG along shallow water rivers, coastal areas

and inter-islands. Our designs for carrier/bunker vessels range from 3,000m³ to 30,000m³ capacity with non-propelled or self-propelled designs to meet a wide range of LNG transportation needs.

In addition to our LNG-fuelled tugs which represent solutions in engine conversion, our Floating Storage Regasification and Power barges and vessels provide downstream solutions in power conversion, and can be installed quickly and economically.

Keppel O&M has accumulated a wealth of experience and capabilities in LNG technology ever since its first LNG carrier repair in 1990. We converted the world's first Floating Storage Regasification Units (FSRU) and are currently undertaking the world's first floating liquefaction vessel (FLNG) conversion in Golar Hilli.

Interview with Acting CEO

In the 2016 Keppel Offshore & Marine (Keppel O&M) Annual Report, Mr Chris Ong, Acting CEO of Keppel O&M shared his thoughts on the outlook and way ahead. *OffshoreMarine* reproduces extracts of the interview here.

WHAT IS THE OUTLOOK FOR KEPPEL OFFSHORE & MARINE IN 2017 AND BEYOND?

We anticipate that 2017 will continue to be a challenging year for us. Despite oil production cuts by OPEC and some non OPEC countries, it may take a while for oil companies and fleet operators to significantly increase expenditures in offshore E&P as they focus on capital discipline and improving balance sheets in the current climate. In addition, the market will need time to absorb the oversupply of existing rigs before we see new rigs being ordered.

However, we believe that the long term demand for energy and the fundamentals of the industry remain strong. The International Energy Agency (IEA) projects a significant increase in worldwide energy demand to 2040 as developing economies continue to grow while global oil reserves are depleting and would need to be replenished.

In the meantime, there are pockets of opportunities in the floating gas and production markets. According to Energy Maritime Associates' (EMA) 2017-2021 report, between 83 and 168 floating production systems are expected to be ordered over the next five years.



Mr Chris Ong, Acting CEO of Keppel Offshore & Marine, shares his thoughts on the outlook for Keppel in 2017 and beyond

Demand for LNG is also expected to increase. Shell's energy outlook forecasts that global LNG demand is expected to increase by 4-5% a year between 2015 and 2030. As the reach and applications of small scale LNG continue to expand, it will increase demand in niche and remote areas.

HOW IS THIS DOWN CYCLE DIFFERENT FROM THE PAST? WHAT ARE YOU DOING TO TIDE THROUGH THIS PERIOD AND PREPARE FOR THE TURNAROUND?

Keppel O&M has weathered many cycles and emerged stronger. One of the differences in this cycle was the growth of US shale oil and its reduced costs of development which contributed to the drastic fall in oil prices. It means that the

offshore oil and gas industry needs to focus on achieving greater efficiencies in cost control and sustainability to be competitive with shale.

For Keppel O&M, we have undertaken restructuring efforts to not only control our overheads and streamline our operations but also make us stronger and more efficient for the future.

In the absence of newbuild rig orders, we are maximising the capacity in our yards with a variety of other projects such as repair, modification and upgrading work as well as the stacking of rigs. Last year, Keppel FELS completed 18 repair and upgrading projects worth more than \$100 million

while Keppel Shipyard repaired over 400 vessels.

Even as we right size, we have been conscious to retain our core capabilities and personnel to be ready for the upturn. We are able to ramp up capacity when the market rebounds and our yards are being restructured to be more efficient through mechanisation and automation to improve work processes, optimise production and reduce reliance on manual labour.

HAVING JUST TAKEN OVER THE HELM, WHAT IS YOUR IMMEDIATE PRIORITY?

My first priority is to ensure that we continue to execute our projects well and ensure that we maintain our strong reputation for safety, quality and timeliness. Our ongoing deal with Borr Drilling is a strong statement to the market that there are opportunities in the current market for win-win solutions. It is also a testament to the strong demand for Keppel's proprietary KFELS Super B Class rigs, even in the present challenging market conditions. Our people are also our key assets and we are taking this time to upskill, train and develop them across a variety of functions.

We are investing prudently and building new capabilities. With Keppel LeTourneau, we have expanded our suite of jackup rig designs as well as our aftersales and aftermarket services. Our joint venture company with Rosneft and MHWirth to set up a design and engineering Centre in Russia will enable us to support Russian and other international customers in the region.

During the downturn, as field operators and oil companies cut down on their capital expenditure including engineering capabilities, we are able to support them with our strong design and engineering competencies. For instance, we are able to provide a more integrated solution by stepping up our involvement and partnering our clients during the Front End Engineering Design (FEED) stage for more complex projects.

WHAT ARE YOUR LONG-TERM STRATEGIES TO BUILD A MORE ROBUST FUTURE FOR THE COMPANY?

We are exploring new businesses that complement our existing ones as well as investing in R&D to diversify and expand our suite of products and services. This will help us to de-risk against the cycles in the oil and gas industry.

To meet the world's growing demand for LNG, we have developed various cost-effective and innovative solutions across the gas value chain, including undertaking the world's first floating liquefaction vessel (FLNG) conversion and building two dual-fuel tugs to our proprietary design. We have also secured a procurement contract to order long lead items (LLI) required for the conversion of a GasLog Ltd LNG carrier to a floating storage and regastication unit (FSRU).

Our R&D units have developed innovations such as liquefaction technology and small-scale LNG carriers. To further bolster our efforts in the LNG-related business, we signed an MOU with Shell to jointly explore potential

opportunities to cater to the demand for LNG as a fuel in coastal areas, inland waterways and the international marine sectors.

In the non-oil and gas markets, we are looking at leveraging our offshore expertise and proprietary technology to be used in adjacent and new markets. Keppel Singmarine secured orders for three trailing suction hopper dredgers, a natural extension of our specialised shipbuilding track record.

Our yard in the U.S., Keppel AmFELS, is exploring opportunities to build vessels in the replacement cycle for the aging Jones Act fleet. Due to the Jones Act, which requires vessels operating in the U.S. to be built, owned and flagged in the U.S., the current U.S.-built fleet is about 33-years old on average, compared to 13-years old for the global fleet.

We are also looking at repurposing our technologies for other markets such as offshore power, offshore desalination and offshore wind. Offshore desalination and power plants can meet the need for power and water in land scarce and remote areas. Keppel FELS recently worked with Keppel Infrastructure to develop a floating desalination plant that is quicker and cheaper to implement than land-based plants.

Through synergies across our business units, we aim to innovate, reinvent ourselves and even look for technologies that disrupt our own existing business models so that we can stay ahead of the competition and deliver the best value solutions to our customers.

Growing as *OneKeppel*

At the Global Keppelites Forum 2017, Mr Loh Chin Hua, Chairman of Keppel Offshore & Marine and CEO of Keppel Corporation, called on Keppelites to take heart in the company's resilience and strong track record, and to heighten collaborative efforts to realise synergies across the Group as it continues its journey towards becoming a global company at the forefront of its chosen industries.



Mr Loh Chin Hua, Chairman of Keppel Offshore & Marine and CEO of Keppel Corporation, reiterated the Group's commitment to its multi-business strategy

On 9 February 2017, over 2,600 Keppelites gathered in about 70 locations worldwide for the third annual Group-wide townhall, the Global Keppelites Forum.

With his address broadcast live from the Keppel Leadership Institute in Singapore, Mr Loh Chin Hua, CEO of Keppel Corporation, provided insights on the achievements of the Group and its various business units, and reiterated the Group's commitment to build on the strong foundations of its multi-business strategy, which continues to bolster its performance despite the challenging external environment.

Mr Loh said, "The challenges we face may be daunting, but we are

not without our strong points. Keppel has many well-tested strengths like our resilience, *Can Do!* spirit, a history of successfully reinventing ourselves, and a robust balance sheet.

"Today, we can add on to these positives: we have a clear vision of who we are, and how our different businesses are engaged in the common objective of providing solutions for sustainable urbanisation. With the many advantages of *OneKeppel*, we will play a pivotal role in shaping the future."

STRONGER TOGETHER

Emphasising this year's "OneKeppel" theme, Mr Loh highlighted the importance of

continuing to collaborate and hunt as a pack. "There are many positive examples of collaboration within and between our business units. However, this is still a new muscle we are getting used to," he said.

"We have to move beyond strong verticals to collaborating and unleashing our synergies. We must look at how we can play as an accomplished orchestra, and hunt better as a pack and capture new pools of profits. Only then will the market reward us with the earnings multiples we deserve as a top-performing multi-business group."

PREPARING FOR THE FUTURE

Beyond dealing with the immediate challenges and making

progress towards the Group's Vision 2020 target, Mr Loh highlighted the importance of imagining a *FutureKeppel*, and laying the foundations to ensure that the company's future remains bright and exciting.

He shared that Keppel continues to actively grow the capabilities of its worldwide talent pool through training and development, and called on Keppelites to volunteer and play their part in shaping the company's sustained success.

"We are at the cusp of transitioning from a proud and successful Singapore company to a sustainable global business. *OneKeppel, Many Careers* is not just a tagline. We hope to get more Keppelites to move across departments, business units and even the different markets we operate in. This is your opportunity to play a part in how the next chapters of Keppel are written," he said.

He added, "Embrace change, be prepared to innovate, experiment and take risks. We must be nimble and seize opportunities. I am confident that we will, as *OneKeppel*, emerge stronger and ready for the future."

VALUABLE INSIGHTS

During the Global Keppelites Forum question and answer segment, Mr Loh, Mr Chan Hon Chew, CFO of Keppel Corporation, and the various business unit CEOs fielded queries from Keppelites around the world. Over 140 questions came fast and furious, courtesy of the live web portal Pigeonhole, with more than 3,550 votes cast for the different questions. *OffshoreMarine* shares some highlights from the segment, which was moderated by Mr Louis Lim, Director of Group Strategy & Development, Keppel Corporation.

"The Forum was a good opportunity for employees overseas to gain a better understanding of the Group's strategy. I am confident that with our Can Do! spirit, we will continue to look for growth opportunities and build a better future together."

Maala Rodel Dalawampu
Commercial Officer
Keppel Batangas Shipyard

"My biggest takeaway is the importance of taking personal responsibility for Keppel's success. At an individual level, I am motivated to upgrade my skills so I can help the company overcome challenges and be better prepared for the future."

Waldir Zanetti
Project Manager
BrasFELS

Project Autobots

Shaping the future through digitisation.

Keppel has embarked on Project Autobots, which aims to harmonise and consolidate the Group's finance, payroll and procurement functions and set up a finance Shared Services Centre. The new harmonised technology platform and Shared Services Centre, together with the use of Robotics Process Automation, will reap efficiencies, increase agility,

enhance controls and improve ways of working.

Since the project kicked-off in February 2017, Keppel Enterprise Services, together with Finance and IT teams across the Group, have been working with Accenture in a series of finance process workshops to validate business requirements and finalise solution

designs for the new harmonised enterprise platform.

Mr Loh Chin Hua, CEO of Keppel Corporation, said, "A unified Enterprise Resource Planning backbone and shared services platform is important to digitise our infrastructure, drive efficiency and achieve better controls in preparation for the future digital economy."

Steady progress

In January 2017, the hull of the CAN DO drillship was delivered to Keppel FELS upon completion of its construction by Japanese shipyard, IHI Corporation (IHI). With immaculate planning by the project team, heavy lift installations for the topside modules have been executed like clockwork on the drillship at Keppel FELS.

The CAN DO drillship design was developed in consultation with customers, major oil companies and vendors. While most modern drillships currently in operation were designed and built for exploration drilling, industry feedback has revealed the need for vessels capable of performing



With immaculate planning from the project team, heavy lift installations for the topside modules have been executed like clockwork on the CAN DO drillship

development and completion drilling in addition to exploration drilling.

Jointly developed by Keppel Offshore & Marine Technology

Centre and its design partner GustoMSC, the CAN DO drillship is designed to overcome the constraints of limited deck space found in most modern-day drillships.

Supercomputing in product designs



Mr Aziz Merchant (second from left), ED, KOMtech, together with recipients of the National Supercomputing Centre Special Honourable Mention for Best Integrated Vertical Domain (HPC in Offshore & Marine)

On 14 March 2017, Keppel Offshore & Marine Technology Centre (KOMtech) was recognised by the National Supercomputing Centre (NSCC) Singapore for its commendable efforts in High Performance Computing (HPC).

KOMtech's project, one of three recipients of the NSCC Special Honourable Mention for Best Integrated Vertical Domain (HPC in Offshore & Marine), made extensive use of NSCC's HPC resources to optimise the design of rigs and vessels in the product development process.

The inaugural NSCC Awards,

held in conjunction with the Supercomputing Frontiers (SCF) Conference, aims to elevate supercomputing in Singapore to the next level.

The key stakeholders of NSCC Singapore are the Agency for Science and Technology and Research (A*STAR), Nanyang Technological University, National University of Singapore and Singapore University of Technology and Design.

KOMtech was also a recipient of the NSCC Outstanding HPC Industry Application Award.

Celebrating safety milestones

To achieve a zero-incident workplace, Keppel Offshore & Marine (Keppel O&M) has a robust safety framework to ensure that all projects are completed safely and efficiently. The first quarter of



Keppel FELS was awarded a safety bonus of \$10,000 USD for the excellent safety record on KFELS Super B Class jackup rig, Hakuryu 15 (pictured, second rig from left)

2017 saw Keppel FELS celebrating milestones in its safety journey as it continues to strengthen its safety culture.

SAFETY BONUS FOR HAKURYU 15

On 20 February 2017, Japan Drilling Company (JDC) and BOT Lease Company awarded Keppel FELS a safety bonus of \$10,000 USD to commemorate the excellent safety record, without Loss Time Incident, on Hakuryu 15, the second KFELS Super B Class jackup rig to join JDC's fleet.

All stakeholders, from yard personnel and contractors to classification society surveyors, worked closely together in order to achieve this remarkable safety feat. Work on Hakuryu 15 is expected to be completed by September 2017.

DYNAMIC VISION BAGS AWARD

Dynamic Vision, a KFELS B Class jackup rig for Vision Drilling, a subsidiary of the Dynamic Offshore Drilling Group (Dynamic Drilling), was conferred the "Best Overall Safety Performance in Offshore Rigs" in the Oil Industry Safety Awards for the years 2014 – 2015.

Congratulating Dynamic Drilling on their win, Mr Chris Ong, Acting CEO of Keppel O&M and MD of Keppel FELS, said, "This award demonstrates the concerted effort of the rig crew in supporting a safety-conscious work environment as well as their strong commitment in maintaining a robust safety culture in Dynamic Drilling."

Illustrating lifesaving rules

Over in Brazil, BrasFELS employees working on the Cidade de Campos dos Goytacazes MV29 project added a creative touch to the yard with their colourful submissions for a Lifesaving Rules Safety Drawing Competition jointly organised by BrasFELS and MODEC.

Held across the months of February and March 2017, the competition, which saw participants submitting drawings on safe work behaviour,

aims to strengthen the safety awareness of all stakeholders in the yard.



BrasFELS and MODEC employees celebrating the win of 1st prize winner, Willian Fernandes Matias Varela, Electrical Fitter, BrasFELS

Deepening industry relations

As a key player in the industry, Keppel Offshore & Marine (Keppel O&M) regularly hosts local and international organisations to exchange knowledge and discuss opportunities for further collaboration.

DIALOGUE WITH ITE

On 4 April 2017, senior management from Keppel O&M and the Institute of Technical Education (ITE) held a dialogue session to explore how the current partnership can be expanded to attract more talent to the offshore and marine industry.

Keppel O&M currently collaborates with ITE to offer the Assistant Technical Associate and Technical Associate Schemes, and is the only organisation in Singapore to be accredited to conduct an in-house Higher National ITE Certificate (NITEC) in Marine & Offshore Technology.

EXCHANGE WITH JAPANESE AMBASSADOR

Japanese Ambassador to Singapore, H.E. Kenji Shinoda, visited the Keppel-NUS Corporate Laboratory on 16 February 2017 to gain a deeper understanding

of how businesses and academia collaborate to drive the industry forward.

This exchange was led by the two Co-Programme Leaders of the Keppel-NUS Corporate Laboratory, Prof Chow Yean Khaw and Mr Aziz Merchant, ED of KOMtech.

The session, which involved a visit to the Robotics & Automation Workshop, follows the Ambassador's visit to Keppel O&M earlier in November 2016, and further deepens the Singapore-Japan business partnership.



Senior management from ITE and Keppel O&M engaged in a robust dialogue on topics such as academic curriculum and attracting talent to the offshore and marine industry

VISIT BY DANISH AMBASSADOR

On 13 March 2017, Keppel O&M played host to Danish ambassador to Singapore, Ms Dorte Bech Vizard, as well as senior management from Danish company, Danfoss Group, which is active in the field of solar and wind power.

Keppel's management, led by Mr Michael Chia, MD (Marine &

Technology) of Keppel O&M and Mr Abu Bakar, MD of Keppel Singmarine, hosted the delegation who sought to get a better understanding of Keppel O&M's ongoing projects and business offerings.

Through a corporate presentation and dialogue with Keppel's management, the delegation exchanged views on market

developments in the maritime transport sector, especially on marine technologies and hybridization.

SHARING INSIGHTS WITH RUSSIAN DELEGATION

On 14 March 2017, Keppel O&M hosted 41 professionals from State Atomic Energy Corporation ROSATOM, the largest atomic power generating company in Russia and one of the leaders in the global market for nuclear power equipment and technology.

During this exchange, Keppel O&M shared about KOMtech and its various sub departments, as well as challenges faced during research.

The yard visit is part of the newly-launched "Technological Innovations Management" educational programme by SKOLKOVO business school in Moscow.



H.E. Kenji Shinoda (second from right), Japanese Ambassador to Singapore, explored the Robotics & Automation Workshop during his visit to the Keppel-NUS Corporate Laboratory



Mr Michael Chia (fifth from left), MD (Marine & Technology) of Keppel O&M, shared with the Danish delegation insights into the Group's business

Committed to safety and well-being

At Keppel Offshore & Marine (Keppel O&M), safety is a core value and the highest priority in all our operations. Recognising the interdependence between work environment and the overall safety, health and well-being of our employees, Keppel O&M regularly enhances its Health, Safety and Environment (HSE) initiatives and infrastructure.

On 10 February 2017, Keppel Shipyard officially opened the Keppel Wellness Gallery, which features interactive health exhibits to educate employees on proper nutrition, an active lifestyle and good mental wellness.

During the Opening Ceremony, Guest-of-Honour, Mr Heng Chiang Gnee, Chairman of the Workplace Safety and Health (WSH) Council, tried his hands on the different exhibits, including a stationary bike

As part of Keppel's efforts to incorporate health and well-being initiatives to strengthen its WSH culture, the gallery also empowers employees with useful information such as the benefits of a balanced diet and the detriments of smoking.

During the opening ceremony, Keppel Shipyard also launched the Total Workplace Safety and Health

2020 (TWSH 2020) programme, a 4-year strategic plan which aims to bring Keppel O&M closer to achieving its goal of an incident-free work environment.

The newly launched Keppel Wellness Gallery builds on Keppel O&M's WSH efforts, which includes the Safety Training Centre and Wellness Support Centre. Since its inauguration in 2010, the Keppel Safety Training Centre has trained approximately 50,000 direct and contract workers through its safety and certification courses.



Joined by Mr Chow Yew Yuen (second from left), then-CEO, Keppel Offshore & Marine, Mr Heng Chiang Gnee (third from left), Chairman of WSH Council, tried the interactive exhibit on proper nutrition at the Keppel Wellness Gallery

Insights for the future

At the 31st Chua Chor Teck Memorial Lecture held on 14 February 2017 at Singapore Polytechnic, guest speaker Mr Tong Chong Heong, former CEO of Keppel Offshore & Marine (Keppel O&M), spoke about Keppel O&M's transformative journey from a small ship repair yard to an industry leader.



Mr Tong Chong Heong (left), former CEO of Keppel Offshore & Marine, answered questions from the floor during the Q&A session, which was moderated by Mr Heng Chiang Gnee (right), ED, Singapore Maritime Institute

Starting his career with Keppel and eventually a Foreman Engineer before rising to the rank of CEO, Mr Tong shared his unique insights on the running of the company, from macro strategies to the nuts and bolts.

The lecture, organised annually since 1986 in remembrance of the late Mr Chua Chor Teck, former MD of Keppel Shipyard and one

of the pioneers of Singapore's marine industry, attracted over 450 industry professionals, students and retirees.

People excellence

For its exemplary people development efforts, Keppel Offshore & Marine (Keppel O&M)

clinched the Workday Award for Best Talent Management Practices (>500 employees) at the HRM

Awards held at The Ritz-Carlton on 24 February 2017.



Mr Vincent Campbell (left), AGM (Human Resources) of Keppel O&M and Keppel FELS, receiving the Workday Award for Best Talent Management (>500 employees) at the HRM Awards 2017

The Workday Award for Best Talent Management Practices recognises Keppel O&M's efforts in a comprehensive range of HR practices, including effective integration processes, training and development, as well as performance appraisal. This year's HRM Awards saw over 100 organisations participating across 21 different award categories.

In 2016, Keppel O&M invested approximately \$12.4 million in the learning and development of its global workforce as part of its Talent Development Framework.

Making a difference

Volunteers across Keppel Offshore & Marine's local and overseas yards were out in full force to make a positive impact on communities around the world in the first quarter of the year.

LEARNING AND BONDING

On 16 March 2017, 39 volunteers from Keppel Shipyard brought 38 children from Care Corner on a trip to the Science Centre Singapore.

The children were visibly enthralled by the various exhibits and eagerly completed their activity worksheets with the help of the volunteers.

Toh Ting Shu, Assistant Commercial Manager, Keppel Shipyard, remarked, "Seeing how fascinated the children were with the displays evoked childhood memories, making this experience an especially meaningful and nostalgic one."

GIFT OF LIFE

In conjunction with Valentine's Day, Keppel Volunteers partnered with the Philippine Red Cross to organise a blood donation drive at Keppel Subic Shipyard and Keppel Batangas Shipyard.

The blood donation drive received overwhelming support from workers at the yards, with a total of 170 bags of blood being donated.

Mr Leong Kok Weng, President of Keppel Philippines Marine,

shared, "Since its official launch in June 2016, Keppel Volunteers in the Philippines has been actively supporting community programmes to pave the way forward for the community."

In January 2017, Keppel Subic Shipyard was awarded a Certificate of Appreciation from the Philippine Red Cross' National Office in recognition of its promotion of blood donation in the country.



Keppel Volunteers brought festive cheer to the children of Care Corner



Workers from Keppel Subic Shipyard and Keppel Batangas Shipyard participated in a blood donation drive organised by Keppel Volunteers and the Philippine Red Cross

Celebrating World Health Day



In celebration of World Health Day, BrasFELS organised health checks and lectures on health-related issues for members of the local community

On 7 April 2017, Keppel FELS Brasil's BrasFELS shipyard celebrated World Health Day with more than 100 members of the community in Angra dos Reis where the shipyard is located. Health checks and lectures on oral health and spine care were organised to raise awareness on health-related issues.

BrasFELS' medical team was also on hand to offer checks on height and weight, blood pressure, and blood glucose level for participants.

Separately, BrasFELS also organised a blood donation drive at Angra's blood centre on 6 April 2017. 10 employees participated in the good cause.

Mr Marlin Khiew, President of BrasFELS, shared, "We care about the health and safety of our employees and their families, and are glad to do our part for the community."

Empowering the next generation

BrasFELS' annual Corporate Social Responsibility initiative, the Teach-It-Forward programme, commenced its third edition in March 2017.

EDUCATIONAL VISIT

On 14 March 2017, a group of ninth-grade students from the Mauro Sérgio da Cunha Municipal School visited BrasFELS.

Besides going on a guided tour of the shipyard, the students learned about BrasFELS' core values, history and operations.

On 15 March 2017, Keppel Volunteers from BrasFELS initiated the first round of Portuguese and



Mr Luiz Caetano (left, standing), Director (Operations) of BrasFELS, shared stories of his professional life with students from the Mauro Sérgio da Cunha Municipal School

Mathematics tuition classes for a group of 25 students from the third grade of the Cornelis Verolme Municipal School. The classes will be conducted once every three months.

Besides helping the students with their studies, the volunteers encourage them to apply sound values in their daily lives.

Conserving our biodiversity

Located within the Singapore Botanic Gardens, the Keppel Discovery Wetlands is the first project in Southeast Asia to recreate a freshwater swamp forest. Officially opened by Prime Minister of Singapore Mr Lee Hsien Loong on 31 March 2017, the venue allows members of the public to experience this unique natural habitat in the heart of the city for the very first time.



Gracing the opening of the Keppel Discovery Wetlands was Prime Minister of Singapore Mr Lee Hsien Loong (sixth from right). Accompanying him were Mr Lawrence Wong (fourth from left), Minister for National Development and Second Minister for Finance; Dr Vivian Balakrishnan (far right), Minister for Foreign Affairs; Ms Sim Ann (second from right), Senior Minister of State, Ministry of Culture, Community and Youth and Ministry of Trade and Industry; Mr Melvin Yong (third from right), Member of Parliament, Tanjong Pagar GRC; as well as Dr Lee Boon Yang (fifth from right), Chairman of Keppel Corporation; Mr Loh Chin Hua (fourth from right), Chairman of Keppel Offshore & Marine and CEO of Keppel Corporation; Mr Chan Hon Chew (second from left), CFO of Keppel Corporation; and Keppel's senior management

The Keppel Discovery Wetlands was officially opened by Prime Minister of Singapore Mr Lee Hsien Loong on 31 March 2017. The area was established with a \$2.08 million commitment from Keppel, which supported the restoration of a freshwater forest wetland ecosystem historically found in the vicinity of the Singapore Botanic Gardens, Singapore's first UNESCO World Heritage site.

The Keppel Discovery Wetlands is part of a new 10-hectare

conservation core at the Singapore Botanic Gardens called the Learning Forest, which also includes the SPH Walk of Giants – a collection of some of the region's tallest tree species, a bamboo garden, as well as a showcase of wild fruit trees.

The restored 1.8-hectare Keppel Discovery Wetlands was designed with ecological considerations in mind, and includes a carefully curated plant collection of over 200 species. The Wetlands restores

the area's existing water sources by creating a linked series of five water bodies that connect to the Swan Lake.

The Wetlands includes the Discovery Trail, Botanists' Boardwalk, Orchid Gardens and Pulau Marsh. Playing host to a diverse range of wetland plants and animals, the Wetlands enhances the biodiversity found in the area and provides opportunities for the public to access and experience a freshwater



Visitors can discover the diverse flora at the Keppel Discovery Wetlands

forest wetland habitat right in the heart of the city.

At the launch of the Learning Forest, PM Lee shared, "Our Botanic Gardens thrives not because of the interesting mix of plants, but because within it, there is life. It is teeming with activity. It is loved and nurtured by the community, by all age groups. I would like to thank everyone who has worked so hard to create this Learning Forest – corporate partners such as Keppel and Singapore Press Holdings, the many volunteers who spend time planting trees or leading guided walks. For them, it is a labour of love.

"Many of the trees in the Learning Forest are still young. But gradually, year by year, they will grow and mature. In the fullness of time, they will enrich our natural heritage. More Singaporeans will

grow to love it, and I hope we can all care for and nurture it so that future generations will also get the chance to enjoy this green gem and form lasting, precious memories of their own."

Dr Lee Boon Yang, Chairman of Keppel Corporation, commented, "The Keppel Discovery Wetlands provides a unique opportunity for Singaporeans to learn about our amazing biodiversity. This initiative resonates with Keppel's commitment to sustainable development. We hope that all visitors will be inspired to better understand and appreciate Singapore's natural environment."

To mark the occasion, PM Lee together with Mr Lawrence Wong, Minister for National Development and Second Minister for Finance, and Dr Vivan Balakrishnan, Minister for Foreign Affairs, planted trees alongside Dr Lee

and Mr Loh Chin Hua, Chairman of Keppel Offshore & Marine and CEO of Keppel Corporation. Also participating in the tree planting were advisers for Holland-Bukit Timah GRC and Tanjong Pagar GRC and Dr Teo Ho Pin, Mayor of North West District, as well as corporate partners, students and volunteers. A total of 80 trees from 20 different species were planted.

Led by Dr Lee, senior management from Keppel Corporation accompanied PM Lee on a guided tour of the Wetlands and were introduced by NParks officials and student representatives to its key features and biodiversity.

Also present at the event were representatives from Keppel Volunteers, who will serve as Green Ambassadors for the Wetlands.

Marking Earth Hour

Rallying behind the call to combat climate change, Keppel Offshore & Marine demonstrated its commitment to saving the planet by participating in Earth Hour on 25 March 2017. From 8.30pm to 9.30pm, non-essential lights at various Keppel yards in Singapore and overseas, were turned off in a symbolic gesture of support.

Organised by the World Wide Fund for Nature, the annual event this year united individuals,

communities and organisations from an unprecedented 187 countries and territories.

In addition to switching off non-essential lights, Keppelites took other steps to raise environmental awareness.

Employees at Keppel Subic Shipyard demonstrated their commitment by writing pledges to reduce their carbon footprint.

“Participation in Earth Hour symbolises our commitment to protect our planet and reduce wastage,” said Mr Ezra Chiam, President of Keppel Subic Shipyard.

“Individuals and organisations play an important role in environmental conservation. Our actions today will impact the environment for future generations,” said Mr Wong Jen Ming, President of Keppel Batangas Shipyard.

Maritime fun

On 23 April 2017, over 60 Keppelites joined 600 teams of two to compete in the Amazing Maritime Challenge (AMC). From navigating a drone at Marina South Pier to solving a word puzzle along the Singapore River, participants travelled around central Singapore to conquer different challenges relating to the marine industry.

Organised by the Maritime and Port Authority of Singapore, in conjunction with the Singapore Maritime Week, AMC is designed to increase the public’s awareness on Singapore’s maritime industry.

Calvin Sutiono, Commissioning Engineer, Keppel Shipyard, who emerged as the top-prize winner,

shared, “I signed up for this race together with my wife and we had a great time conquering challenges at the different game stations. Not only did I fly a drone

for the first time, I also got to learn more about the history and developments of our maritime industry.”



Over 1,200 participants pit their wits against each other at the Amazing Maritime Challenge 2017

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First delivery for 2017



Celebrating the naming of the spread-moored Floating Production Storage and Offloading unit, John Agyekum Kufuor, are H.E. Rebecca Akufo-Addo (first row, fifth from right), First Lady of the Republic of Ghana; Mr John Agyekum Kufuor (first row, fourth from right), former President of the Republic of Ghana; Mr Chow Yew Yuen (first row, third from left), then-CEO, Keppel Offshore & Marine; and Mr Lim Han Weng (first row, extreme left), Group Executive Chairman, Yinson Holdings Berhad

On 16 February 2017, Keppel Shipyard delivered a Floating Production Storage and Offloading (FPSO) vessel to Yinson Production (West Africa) Pte Ltd (Yinson), a wholly-owned subsidiary of Yinson Holdings Berhad, safely.

The spread-moored FPSO unit was named John Agyekum Kufuor during a ceremony held at Keppel Shipyard on 3 February 2017. It is being chartered by ENI Ghana Exploration & Production Limited (ENI Ghana) to process oil and gas from the Offshore Cape Three Points block located in Offshore Ghana.

Mr Michael Chia, MD (Marine & Technology) of Keppel Offshore & Marine (Keppel O&M), said, "Over the years, we have strengthened

our relationship with our repeat customers, Yinson and ENI Ghana, and we are glad to support them once again in providing FPSO solutions to the market.

"We have a strong track record of customising FPSOs for a wide variety of fields. FPSO John Agyekum Kufuor is our 27th conversion project for Africa, and 125th overall."

FPSO John Agyekum Kufuor has a storage capacity of 1.7 million barrels, with an oil processing capacity of 58,000 barrels per day. It has a design life of 20 years without dry docking and can be moored in an average water depth of 1,000m with a total topside weight of almost 15,000 tonnes.

Mr Lim Chern Yuan, Group CEO of Yinson, said, "There are opportunities in the FPSO market and we are glad to be able to meet those needs through our FPSO solutions. Our trust and confidence in Keppel extends back to 2014 when we worked together on FPSO Lam Son. We are confident that FPSO John Agyekum Kufuor will be a valuable addition to ENI Ghana's exploration and production activities, strengthening their presence in Africa."

Keppel Shipyard's work on FPSO John Agyekum Kufuor included modification work, new equipment installation complete with associated piping, electrical and instrumental systems, as well as installation and integration of the FPSO process topsides.