

# OFFSHOREMARINE

A newsletter of Keppel Offshore & Marine

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**RECORD-SETTING  
ICE-CLASS VESSEL  
DELIVERED**



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Keppel Shipyard hosted senior management from ExxonMobil and SBM Offshore as part of a combined effort to ensure high workplace HSSE standard and performance for the major FPSO conversion project secured in October 2017.

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# Positioning for new chapter of growth

Despite a challenging 2017, Keppel Offshore & Marine (Keppel O&M) has stayed resilient and is looking to emerge stronger to build a more disciplined and sustainable business. *OffshoreMarine* reproduces extracts of the speech by Mr Loh Chin Hua, CEO of Keppel Corporation and Chairman of Keppel O&M at Keppel Corporation's 4Q & FY 2017 results briefing to media and analysts.

The global resolution reached by Keppel Offshore & Marine (Keppel O&M) over past misdeeds in Brazil brings an end to what has been a painful chapter for Keppel – one that we have recognised and dealt firmly with. This is not Keppel. We care not just about results, but also how they are obtained.

The Board and Management have thoroughly investigated the allegations and dealt with the issues that were uncovered. We have put in place enhanced compliance controls, including comprehensive training and certification, to prevent any repeat of such misdeeds.

Our core value of integrity prohibits Keppel from engaging in any unethical practices or behaviour. This is absolutely clear to me as CEO. We will not tolerate any behaviour or action from Keppelites that deviates from this fundamental principle. The Board and Management are determined to regain the trust that has been lost. We will win business legally and ethically, based on our collective strengths of superior customer-centric solutions and good track record of execution.

With this chapter now behind us, we look forward to continuing on our growth trajectory and building a more disciplined and sustainable business – a Keppel that will remain trusted and admired by all our stakeholders.

## OPERATIONS REVIEW

There is growing optimism in the offshore and marine industry, following the recovery of oil prices on the back of extended supply cuts by OPEC and other oil producers. The increase in offshore rig transactions has also helped to improve the outlook. However, the rig market continues to be plagued by a supply overhang, and both utilisation and day rates remain low. Whilst Final Investment Decisions (FID) have doubled in 2017 compared to 2016, and are expected to gather momentum as oil companies restart their oil exploration and exploitation programmes, it may be some time yet before they translate to orders for new drilling units. However, we continue to see opportunities in the demand for production assets, LNG solutions and specialised vessels.

Notwithstanding the current

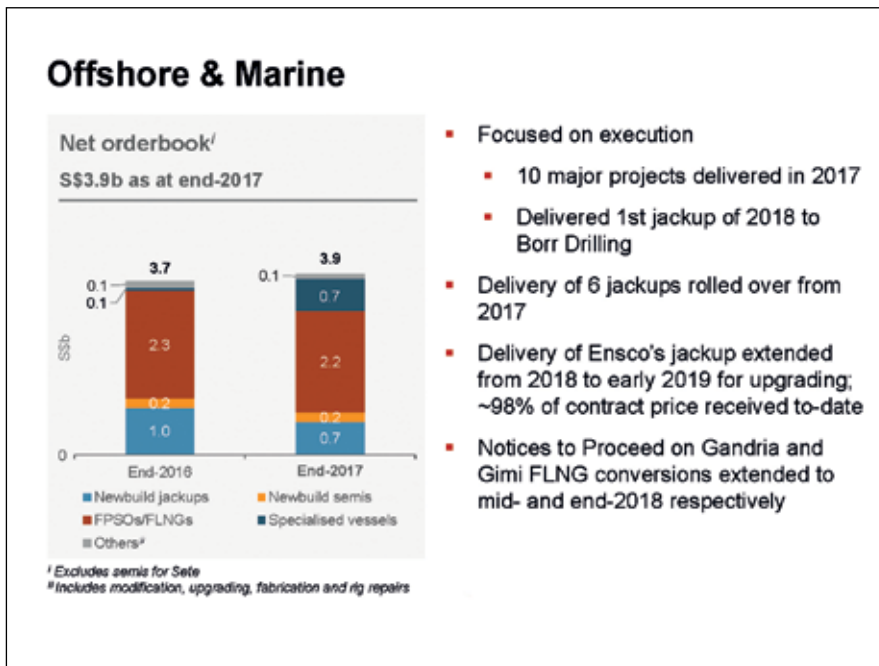
challenges, we remain confident about the long-term potential of the offshore and marine business. Energy demand remains strong, driven by global economic growth. The increasing efficiency by operators has also lowered the cost of exploration and production (E&P), while continued rig attrition will contribute to the eventual restoration of supply and demand equilibrium for the rig market.

In FY 2017, Keppel O&M incurred a loss of \$835 million compared to a net profit of \$29 million a year ago. This was mainly due to the one-off impact of the financial penalty and related costs, an additional \$81 million provision for losses made on the Sete Brasil projects and \$54 million in impairment on other assets.

Keppel O&M secured new contracts worth about \$1.2 billion from new and repeat customers, including two LNG dual-fuel containerships from Pasha Hawaii, Floating Production Storage and Offloading (FPSO) jobs from SBM Offshore, Prosafe and Petrobras, as well as three dredgers from Jan De Nul.

*Continues on page 4...*

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As at 31 December 2017, Keppel O&M's orderbook stood at \$3.9 billion, excluding the contracts from Sete Brasil, compared with \$3.7 billion at the end of 2016.

Keppel O&M kept its focus on execution and 10 major projects were delivered in 2017. Earlier this month, Keppel FELS also delivered the first jackup of 2018 to Borr Drilling.

Meanwhile, we have reached an agreement with our customer Golar LNG to extend the notice to proceed for the Gandria and Gimi FLNG vessel conversions to mid- and end-2018 respectively. Golar LNG has announced that FID for Gandria is expected in 2018 and they have provided funds to kick start some early work in the conversion of Gandria.

In the year ahead, our yards will continue to focus on executing both new and existing contracts. About half of the orderbook to be delivered this year are non-drilling projects. We will continue to expand our offerings and capabilities, and explore new markets.

#### SHAPING THE FUTURE

The global economy is experiencing a broad-based upturn, and we are excited about the many opportunities presented by strong urbanisation trends across the businesses that we are in – whether it is the demand for offshore production assets or LNG solutions to meet growing energy needs, attractive urban environments and reliable infrastructure to support sustainable communities,

or efficient data centres and logistics solutions to buttress the digital economy and growing e-commerce. Demand for homes and offices in our key markets remains robust, underpinned by strong growth prospects.

Today, Keppel is not just a group of diverse companies who share a common name, but an ecosystem of companies working closely together with a common purpose, as *OneKeppel*, to provide compelling solutions for sustainable urbanisation.

We recently updated our Mission to depict our shared goal – “Guided by our operating principles and core values, we will deliver solutions for sustainable urbanisation profitably, safely and responsibly.”

The refreshed Mission reflects more closely the Group's current focus, and better prepares and positions us to compete internationally as we stride confidently into the future.

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## IN CONVERSATION

OffshoreMarine shares highlights of management's responses to key questions from the media and investment community.

**Q: There has been an increase in new orders year on year. What is your outlook for Keppel Offshore & Marine (Keppel O&M) and where do you see the revenues coming from?**

**CO:** Keppel O&M has been on a diversification drive. 50% of the projects to be delivered in 2018 are non-drilling solutions. Our diversification strategy is bearing fruit and we will continue to work on our gas strategy and Liquefied

Natural Gas products. We are hopeful that 2018 will be a more fruitful year than 2017, if all of our targets are met.

**Q: What had changed in the last 12 months which resulted in the additional provisions for losses of \$81 million made for the Sete Brasil projects?**

**LCH:** We made a \$230 million provision for Sete Brasil's semis at end-2015, and we have been

reviewing the assumptions every quarter. Following our discussion with Sete Brasil's consultant in 4Q 2017, we came to a conclusion on what the likely scenario would be. That had shifted the way we looked at the outcomes, and as such, there was a necessity for us to take a further provision. We believe that this provision is enough for now but we will have

*Continues on page 6...*



Leveraging its research and development capabilities as well as conversion expertise, Keppel O&M has developed a suite of solutions across the LNG value chain



Continued from page 5.

to continue monitoring the situation.

**Q: Why was there a loss at Keppel O&M in 4Q 2017 even after excluding the one-off penalty and related costs?**

**CHC:** The loss at Keppel O&M in 4Q 2017, excluding the one-off penalty and related costs, was mainly due to lower operating results and share of associated companies' losses.

**Q: When will you make the payment for the US\$422 million penalty? Do you expect more penalties to come or is this it?**

**LCH:** We have paid about 25% in January, and we expect to pay another 12.5% in March and 50% in May. The remaining 12.5% will likely be paid at the end of the third year. This is a global settlement with the criminal authorities in the US, Brazil and Singapore, so this should be final as far as these investigations are concerned.

**Q: Have any of your existing customers stopped working with Keppel as a result of the bribery situation? What are you doing to maintain working relationships with customers following the global resolution?**

**LCH:** Our customers have not stopped working with us. We have been engaging our customers and some of them have asked certain questions to get a better understanding of our enhanced compliance framework.

We encourage all our Keppelites to take legitimate business risks for which we get a suitable return for taking those risks.

But there are some bright lines that we should not cross, and it is very clear to the team here and to the Board.

Of course, we will have to continue to work very hard to demonstrate that we have a very strict compliance regime, and that we will only engage in ethical and legal activities.

**Q: What is the contribution of the Brazilian operations in terms of the offshore business to the overall Group revenue?**

**CO:** Operations in Brazil remain an important part of our *Near Market, Near Customer* strategy. Right now besides the Sete projects, our team is still working hard to deliver projects like P-69. We delivered P-66 last year, ahead of schedule. What we are trying to do is to enhance our offerings by providing on-time, on-budget solutions to customers. Brazil is a very important part and still remains relevant to our global presence in terms of operations.

**LCH:** This is also perhaps an important point to make that global resolution allows the company to draw a line under the chapter and we can continue to work in all these markets, including Brazil and the US.

**Q: Do you think the global resolution might actually put you at a slightly disadvantageous position when you tender for jobs?**

**LCH:** I do not believe so. Keppel O&M has a lot of strengths in terms of our solutions, our on time and safe delivery. We can rely on these strengths to win contracts legally and ethically. I believe that many of our customers appreciate us for these strengths. As Chris mentioned, we are still very engaged in Brazil. We are working with SBM, Petrobras and different parties in Brazil. Of course it is really up to us to continue to stay as a disciplined company, and make sure that we do things right and do the right things. If we can do that and continue to focus on our strengths in execution and solutions, I think we will be fine.

**LCH – Mr Loh Chin Hua,**  
CEO of Keppel Corporation

**CHC – Mr Chan Hon Chew,**  
CFO of Keppel Corporation

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

# First rig delivery of 2018

Keppel continues to set the industry benchmark for rigs that provide superior performance and are efficient and reliable.

On 5 January 2018, Keppel FELS delivered the jackup rig, SAGA, to Borr Drilling Limited (Borr Drilling) safely, on time and on budget. Built to Keppel's proprietary KFELS Super B Class design, SAGA is the first of five jackup rigs that Keppel is building for Borr Drilling.

Mr Chris Ong, CEO of Keppel Offshore & Marine (Keppel O&M), said, "This will be the 12th KFELS Super B Class rig and the

66th rig of the KFELS B Class family to enter the market. Keppel O&M continually engages our customers to develop win-win solutions."

"As the drilling market recovers, the quality and capabilities of our KFELS B Class designs will be important differentiators for rig owners seeking efficient and reliable operations. Our rigs have set the industry benchmark and we are confident that this rig will be just as successful when deployed."

Mr Simon Johnson, CEO of Borr Drilling, added, "Our partnership with Keppel FELS allows us to

provide rigs with leading-edge specifications ready to deliver the highest operational performance to our customer base."

"We are looking to be paid for the performance that we deliver and our relationship with Keppel FELS is one of several crucial partnerships we are fostering that are focused on improving industry outcomes. Our KPI's are focused on accelerating time to first oil."

The KFELS Super B Class rigs are designed to operate in water depths of up to 400 feet, and drill down to depths of 35,000 feet. With a two million pound drilling system and a maximum combined cantilever load of 3,700 kips, the KFELS Super B Class is equipped with tremendous horsepower during drilling operations.



Keppel continues to deliver rigs that provide superior performance and are efficient and reliable

# Keppel delivers 11th ice-class vessel



Management from Keppel O&M, New Orient Marine and Maritime Construction Services celebrated the naming of MPV Everest, the 11th ice-class vessel delivered by Keppel Singmarine

Keppel Singmarine marked a significant milestone with the delivery of multi-purpose ice-class vessel MPV Everest to New Orient Marine Pte Ltd, a subsidiary of Luxembourg-based Maritime Construction Services SA., on 15 December 2017.

Completed with an excellent safety record, MPV Everest is the 11th ice-class vessel delivered by Keppel Singmarine, the highest number by any company in the last decade.

Mr Abu Bakar Mohd Nor, MD (Gas & Specialised Vessels), Keppel Offshore & Marine (Keppel O&M), and MD, Keppel Singmarine, said, "We are pleased to deliver this state-of-the-art multi-purpose ice-class vessel, built based on

our proprietary design, to the highest satisfaction of Maritime Construction Services. This is the 11th ice-class vessel we have built and it extends our track record as the leading shipyard in designing and building ice-class vessels."

Built to the proprietary design of Keppel O&M's ship design and development arm, Marine Technology Development, MPV Everest can operate in ambient temperatures as low as minus 30 degrees Celsius. It has an Ice Class Arc 5 notation and capabilities such as Class 3 dynamic positioning. It can also navigate in ice up to one metre in thickness.

Mr Knut Reinertz, Director of Maritime Construction Services,

said, "The addition of this highly versatile, robust and high specification multi-purpose ice-class vessel to our fleet will enable us to provide a wide variety of value-added services to our customers. It is designed for efficient and high-performance operation even in harsh Arctic and cold climate conditions. This is a result of our experience as an operator and charterer, combined with Keppel's expertise in specialised ice-class vessels. I am confident that the vessel will be a success when deployed in cold or warm climate regions."

MPV Everest's versatility allows it to execute subsea repair and construction activities in water depths of up to 3000 metres. It can also carry out well intervention, diving support services with an 18-men twin-bell system, fire-fighting and emergency rescue operations, as well as towing and the provision of supplies in Arctic terrain.

In the last decade, Keppel O&M has completed 10 ice-class specialised shipbuilding projects, excluding the MPV Everest. These include four ice-class Anchor Handling Tug Supply/rescue vessels, two icebreakers, two ice-class supply vessels, an ice-class multipurpose duty-rescue vessel and an ice-class Floating Storage and Offloading vessel.



# Execution excellence

With cutting edge technology and an experienced project team, Keppel Singmarine is on track to extending its impressive track record of designing and building some 400 ships of various specifications and functions.

## LNG CARRIERS

Keppel Singmarine struck first steel for the building of two small-scale dual-fuel Liquefied Natural Gas (LNG) carrier vessels for Stolt-Nielsen Gas B.V., a subsidiary of Stolt-Nielsen Limited, at its

Nantong shipyard on 14 December 2017.

The strike steel ceremony was attended by Keppel's senior management, as well as representatives from Stolt-Nielsen Gas B.V., and classification society DNV GL. These versatile small-scale LNG carriers will have a class notation for bunkering, and will be able to reach end users located in remote areas which are not served by pipelines.

The LNG carriers are expected to be completed in 2Q and 3Q 2019 respectively, and will each have a capacity of 7,500m<sup>3</sup>.



The strike steel ceremony for the two small-scale LNG carrier vessels was witnessed by key management from Stolt-Nielsen Gas B.V, Keppel Singmarine and DNV GL

## TRAILING SUCTION HOPPER DREDGERS

Keppel Singmarine marked another successful milestone in its suite of non-oil and gas solutions with the keel laying of a Trailing Suction Hopper Dredger (TSHD) for its long-standing customer, the Jan De Nul Group.

Held on 13 December 2017 at the Keppel Nantong Shipyard in China, this is the third dredger to be built for the Jan De Nul Group. The dredger is expected to be completed in 1H 2019.

The dredger will be able to dredge to a maximum depth of 27.6m and have a hopper capacity of 3,500m<sup>3</sup>.



The successful keel laying for the third TSHD for the Jan De Nul Group marked another milestone in Keppel Singmarine's track record for non-oil and gas solutions

# Launch of dual-fuel tugs

Leveraging on the expertise of Asian Lift, a partnership between Keppel FELS and Smit Singapore, Keppel Singmarine successfully launched the two dual-fuel harbour tugs built for Keppel Smit Towage and Maju Maritime on 15 December 2017.

Adopting an innovative and efficient method, the Asian Hercules II crane, which has a lifting capacity of 3,200 metric tonnes, was used to lift the entire 65-tonne tug off the quayside and into the water.

In doing so, engineering teams from Asian Lift and the production

department of Keppel Singmarine had to work together for months to ensure that the centre of gravity of the vessel was accurately calculated, and that the hull structure and the lifting eye lugs, which secured the vessel to the crane, were strong enough to withstand the stress caused by the lifting.

The dual-fuel tugs were built to Keppel's proprietary design, which won the Outstanding Maritime R&D and Technology Award at the 2015 Singapore International Maritime Awards, and will be completed in 2Q and 3Q of 2018.



The launching of the dual-fuel tugs by Asian Lift and Keppel Singmarine demonstrated synergy, innovation and technical expertise

# Agility and precision



Keppel Singmarine Brasil displayed agility and precision to deliver the GNL 1001 ahead of schedule and under budget

Keppel Singmarine Brasil has successfully delivered the GNL 1001 Platform Supply Vessel (PSV) to Guanabara Navegação Ltda on 1 December 2017, one month ahead of schedule and under budget.

The PSV was first constructed to carry fluid loads. However, nearing completion, the vessel was modified to carry general cargo instead due to changes in market conditions. This involved the modification of all the cargo tanks on board, as well as the installation of a new deck crane. Despite this, Keppel Singmarine Brasil displayed agility and precision to ensure the

on-time and on-budget delivery of the vessel.

Built to the proprietary design of Keppel O&M's ship design and development arm, Marine Technology Development (MTD), the GNL 1001 will be bareboat chartered to Galaxia Maritima SA and subsequently start work with Petrobras.

The PSV is equipped with a Class II Dynamic Positioning System and has a cargo deck capacity of 1800 tonnes. It can carry various types of cargo, including dry bulk, portable water and ballast water.



# Advancing solutions for cleaner energy



Mr Mohamed Sahlan Bin Salleh (fourth from right), ED (Operations), New Builds, Keppel O&M, was one of the signatories at the REIDS MoU signing ceremony witnessed by Dr Koh Poh Koon (ninth from right), Senior Minister of State, Ministry of Trade and Industry and Ministry of National Development

Keppel Offshore & Marine (Keppel O&M) is at the forefront of providing sustainable energy solutions as the industry focuses on cleaner energy technologies.

As part of Singapore International Energy Week (SIEW) 2017, Keppel O&M entered into a Memorandum of Understanding (MoU) with Nanyang Technological University (NTU) on 24 November 2017, to explore collaboration opportunities in renewable energy and micro-grid projects.

This is part of NTU's Renewable Energy Integration Demonstrator Singapore (REIDS) project, which will research and develop solutions in micro-grid infrastructure and look into the integration of solar, wind and tidal power, as well as waste-to-energy and power-to-gas technologies.

FueLNG, a joint venture between Keppel O&M and Shell Eastern Petroleum, also showcased their



FueLNG showcased their recent achievements at the Gas Asia Summit, such as the first commercial LNG bunker transfer in Singapore for the floating liquefaction vessel, Hilli Episeyo

commercial LNG bunkering solutions during the Gas Asia Summit. Held in conjunction with SIEW on 25 and 26 October 2017, the Summit was a good opportunity for the company

to share more on their recent achievements, such as the completion of the first commercial LNG bunker transfer in Singapore for the floating liquefaction vessel, Hilli Episeyo.

# Active project engagement



Mr Chor How Jat (third from right), MD (Conversion & Repairs), Keppel O&M, and senior management from ExxonMobil and SBM Offshore including Ms Lisa Waters (fourth from right), Vice President, ExxonMobil, on a yard tour to understand operations in the shipyard

Keppel Offshore & Marine (Keppel O&M) works closely and regularly engages clients throughout the course of a project to ensure its safe, on time and on budget delivery. The major Floating Production Storage and Offloading vessel (FPSO) conversion project secured by Keppel Shipyard is no exception.

Keppel Shipyard had in October 2017 secured a contract from long-standing customer, SBM Offshore N.V., to convert a Very large Crude Carrier (VLCC) into an FPSO. The shipyard's work scope includes refurbishment and life extension works, such as the upgrading of living quarters, fabrication and installation of spread mooring systems, as well as the installation and integration of topside modules.

On 7 December 2017, Keppel Shipyard hosted senior management from ExxonMobil and SBM Offshore to provide an update on the project as well as review the work planned for the next quarter. During this visit, Health, Safety, Security and Environment (HSSE) recognition awards were also given to outstanding supervisors in recognition of their exemplary safety practices.

A month later on 17 January 2018, senior management from ExxonMobil, SBM Offshore and Keppel Shipyard participated in a HSSE engagement forum together with site supervisors and workers.

They discussed key aspects of the project and awarded HSSE awards to best-performing employees

for their contributions to safety excellence.

These sessions reinforce a robust safety culture and allow senior managers to become more actively engaged in supporting the project through its entire course to achieve high workplace HSSE standards and performance.

The converted FPSO will have a storage capacity of 1.6 million barrels of crude oil and is capable of producing up to 120,000 barrels of oil per day. The vessel will have a gas treatment capacity of circa 170 million standard cubic feet per day and a water injection capacity of circa 200,000 barrels of water per day.



# Project of the Year

Testament to its superior technical capabilities and track record, BrasFELS secured one of the top prizes at the Projeto e PMO do Ano 2017 (Project of the Year) competition held in Brazil on 22 November 2017.

Organised by Mundo PM Magazine and sponsored by Microsoft and project management consultancy Proserpi, the competition featured four categories across fields such as innovation, academia and corporations.

Among three award submissions, BrasFELS' P-66 project secured the top spot in the corporate category.

The shipyard's work scope for this floating production storage and offloading (FPSO) unit included the fabrication, integration, testing and commissioning of topside modules.

The two other submissions – the FPSO Cidade de Campos dos Goytacazes MV29 and the extension of the shipyard's gantry crane rail – both made it to the semi-finals.



Mr Herman Effendy (first from right), President of BrasFELS, together with Mr Waldir Zanetti (second from right), Project Manager of BrasFELS, who represented BrasFELS at the Project of the Year competition

# Accident prevention

As part of its 15th Internal Week of Accident Prevention (SIPAT) that was held from 30 October 2017 to 3 November 2017, BrasFELS launched the Keppel O&M Life

Saving Rules, a set of critical steps to help prevent accidents. In conjunction with SIPAT, a drawing competition was organised for the children of

BrasFELS' employees. Themed 'Staying alert and keeping safe', employees were encouraged to share the Keppel O&M Live Saving Rules with their children, who then illustrated how the theme could be applied at home, at school or in the workplace.



Mr Herman Effendy (first from right), President of BrasFELS, presented the prize of the safety drawing competition to the winner of the 9-12 age category

More than 40 drawings were submitted across two age categories – 6 to 8 years, and 9 to 12 years. After two rounds of judging, two winners emerged. On 7 November 2017, the winners received their prizes over lunch with their families. The award ceremony was followed by a yard tour so that the children could better understand operations in the yard.

# 2017 in review

## Q1

BrasFELS delivered the Floating Production Storage and Offloading vessel (FPSO) P-66 to Tupi BV.

Keppel Shipyard delivered the FPSO vessel John Agyekum Kufuor to a subsidiary of Yinson Holdings Berhad.

## Q2

Keppel FloaTEC LLC secured a contract from PTSC Mechanical & Construction to provide engineering, technology and construction management support services for the Repsol Ca Rong Do Tension Leg Wellhead Platform (TLWP) to be built in Vietnam.

Caspian Shipyard Company delivered the first modern semisubmersible to be almost completely built in Azerbaijan, Heydar Aliyev, to Caspian Drilling Company Ltd, a subsidiary of the State Oil Company of Azerbaijan Republic (SOCAR).

Keppel Singmarine secured contracts to build two Liquefied Natural Gas (LNG) carrier vessels for Stolt-Nielsen Gas B.V. and two Trailing Suction Hopper Dredgers for a wholly-owned subsidiary of Jan De Nul Group.

Testament to the reliability of Keppel's proprietary KFELS Super B Class rigs, Keppel FELS completed the novation of contracts for five jackup rigs under construction for Transocean to Borr Drilling.



The FPSO vessel John Agyekum Kufuor is Keppel O&M's 27th conversion project for Africa, and 125th overall



Built to Keppel FELS' proprietary DSS™ 38M design, the Heydar Aliyev is the first modern semisubmersible to be almost completely built in Azerbaijan





The two state-of-the-art dual-fuel LNG containerships for Pasha will be built to Keppel's proprietary innovative design



Keppel O&M entered into a Heads of Agreement with Pavilion Energy and Indonesia state-owned PT Perusahaan Listrik Negara on 7 September 2017 to explore opportunities in the development of small-scale LNG distribution in West Indonesia

Keppel Shipyard secured four contracts for the conversion, repair and modification of four vessels.

**Q3**

Capturing opportunities in the market for Jones Act vessels, Keppel AmFELS secured a contract from Honolulu-based Pasha Hawaii for the construction of two dual-fuel LNG containerships, to be built to Keppel's proprietary design.

Keppel O&M entered into a Heads of Agreement with Pavilion Energy and Indonesia state-owned PT Perusahaan Listrik Negara to explore opportunities in the development of small-scale LNG distribution in West Indonesia.



FueLNG conducted the first commercial LNG bunker transfer in Singapore from 22 July to 23 September 2017

FueLNG, a joint venture between Keppel and Shell Eastern Petroleum (Pte) Ltd, achieved the first commercial LNG bunker transfer in Singapore by completing truck-to-ship bunkering for the Floating Liquefaction Vessel (FLNGV) Hilli Episeyo.

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Baku Shipyard, a joint venture between Keppel O&M, SOCAR and Azerbaijan Investment Company (AIC), delivered the state-of-the-art subsea construction vessel, Khankendi, for the Caspian region.

BrasFELS delivered the Cidade de Campos ds Goytacazes MV29, its fifth FPSO conversion project for MODEC.

Keppel Shipyard delivered the MTC Ledang to MTC Engineering, as well as the FPSO BW Catcher, its twelfth FPSO to BW Offshore.

## Q4

Keppel Shipyard delivered the world's first converted FLNGV, Hilli Episeyo, for operation in offshore Kribi, Cameroon.

Keppel O&M secured an FPSO conversion contract from SBM Offshore, as well as projects from repeat customers Petrobras and SOFEC.

Keppel Singmarine delivered the multi-purpose ice-class vessel, MPV Everest, to Maritime Construction Services.

Keppel O&M reached a global resolution with authorities in the US, Brazil and Singapore, bringing closure to the corruption investigations in Brazil.



Designed by Keppel O&M and built by Baku Shipyard, the subsea construction vessel, Khankendi, will install the biggest subsea production system in the Caspian Sea



Delivered in the third quarter of 2017, the FPSO BW Catcher has an oil storage capacity of 650,000 barrels, with a processing capacity of 60,000 barrels per day



Hilli Episeyo, the world's first FLNG conversion project, was converted from a 1975-built Moss LNG carrier with a storage capacity of 125,000 m<sup>3</sup>



# Driving HSE Excellence as *OneKeppel*



Keppelites, contractors, subcontractors, partners and business associates renewed their collective commitment to safety excellence at the 11th Keppel Group Safety Convention

Safety is a core value at Keppel, and an integral part of our business.

On 7 November 2017, over 450 employees, partners, contractors and subcontractors reaffirmed their collective commitment to safety at the 11th edition of the Keppel Group Safety Convention with the theme, 'Driving HSE Excellence as *OneKeppel*'.

In his opening address, Mr Loh Chin Hua, CEO of Keppel Corporation, emphasised the importance of collaborating across business units and departments to drive improvements in safety performance. He shared, "The same collaborative efforts for *OneKeppel* can be applied through the sharing of best practices and lessons learnt globally to avoid recurrence of similar safety lapses."

Gracing the event as Guest-of-Honour was Er Ho Siong Hin, Commissioner for Workplace Safety and Health (WSH), Ministry of Manpower. Commending Keppel's commitment to safety

in his keynote address, he said, "I would like to congratulate the Keppel Group for clinching 36 awards at this year's WSH Awards. It goes to show how safety and health is a top priority in Keppel and how its workforce is engaged and committed to high WSH standards."

The convention also saw the continuation of the annual Keppel Group Safety Awards which recognised 21 employees who have gone the extra mile to enhance safety at their worksites. Thirty-four teams from across the Group were also awarded for their outstanding Safety Innovation Team projects.

Making its debut were two safety videos, the safety message by Mr Loh Chin Hua, CEO of Keppel Corporation, and an animation entitled 'Rex: The 5 Key Safety Principles', both of which will serve to strengthen engagement with workers on the ground.

The convention also featured a lively sharing session by seven

frontline managers who discussed how employees can take action to reinforce safety at work and at home.

In his closing remarks, Mr Tan Ek Kia, Chairman of Keppel Corporation's Board Safety Committee (BSC), reiterated the BSC's commitment to strengthening the Group's safety culture.

"We take pride in adopting a hands-on approach to safety management and will continue to visit worksites and engage all of you to better understand how and where we can help maintain high safety standards. While the BSC continues to lead efforts to improve the Group's safety performance, safety is and will remain a collective responsibility," Mr Tan emphasised.

# Spurring Innovations

Innovation is an imperative for organisations operating in today's environment of relentless competition and complexity. In recent months, Keppel embarked on several initiatives to enhance the conditions for innovation to thrive.

### KEPPEL TECHNOLOGY & INNOVATION

Keppel Technology & Innovation (KTI) was launched in January 2018. As a change agent and innovation catalyst for the Group, KTI aims to transform how Keppel harnesses technology and innovation to create value for stakeholders. Mr Louis Lim, Director of Group Strategy, Keppel Corporation and Chief Operating Officer, Keppel Land, was concurrently appointed to lead KTI as Managing Director from 1 January 2018.

KTI will be a platform for the Keppel Group to co-create and incubate ideas for tangible outcomes, be it to develop and improve on products and services, or enhance business models and ways of working.

As a Group-wide resource, KTI will draw on the strong expertise, experience and track record that Keppel Offshore & Marine Technology Centre (KOMtech) has built over the past decade, since its inception in 2007.

Located at level 11 of Keppel Bay Tower, adjacent to the Keppel Leadership Institute, KTI has an open office concept, with facilities and programmes to foster creativity, collaboration and capability-building. Interdisciplinary teams sponsored by Keppel's business units can be housed at KTI and draw on KTI's resources to nurture fast-moving ideas and projects across the Group. These projects could then be commercialised, rolled-out and scaled-up.

For the practical benefits of proximity to shipyard facilities for prototyping and experimentation, KTI will have a satellite office (KTI@ Gul) for some Keppel O&M-sponsored projects.

KTI comprises four key pillars – *InnovateKeppel*, *IncubateKeppel*, *TechKeppel*, and *PartnerKeppel*:

*InnovateKeppel* focuses on idea generation, building capabilities and skills, as well as identifying macro trends and potential disruptions. Ideas with commercial viability will be incubated at KTI.

*IncubateKeppel* oversees teams to ensure that they are on track with project milestones, driving focus on business development and commercial viability as the end-game.

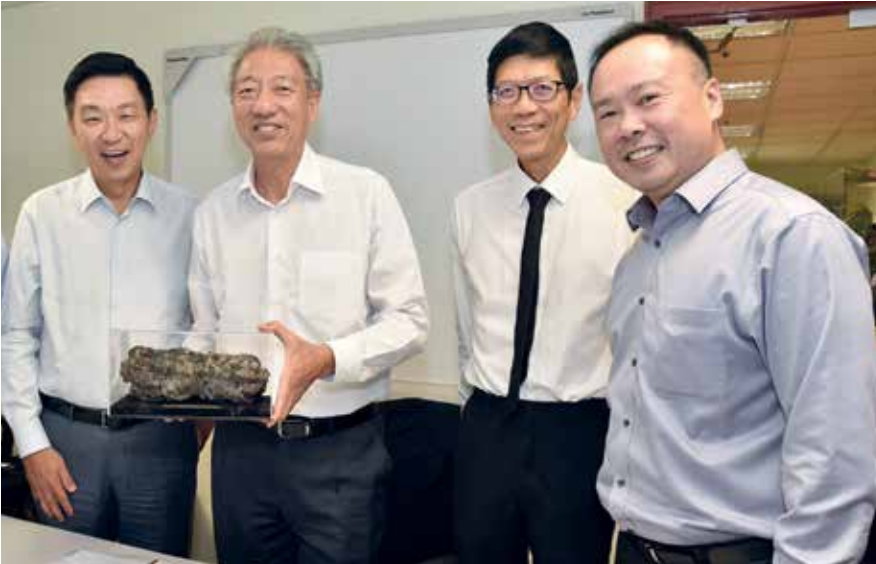
*TechKeppel* leads efforts on technology foresight, and provides technical input and support to project teams.

*PartnerKeppel* engages external parties such as institutes of higher learning, government bodies and agencies, the venture capital and start-up community, as well as other leading organisations to help accelerate Keppel's learning



Mr Chris Ong (fourth from right), CEO of Keppel O&M, presented Team iRobot with the Star Award for their innovative robot that improved safety and efficiency at the yard





(From left to right) Mr Loh Chin Hua, CEO of Keppel Corporation, Mr Teo Chee Hean, Deputy Prime Minister and Coordinating Minister for National Security, Prof Tan Chorh Chuan, then-President of NUS and Mr Chris Ong, CEO of Keppel O&M, with a polymetallic nodule extracted from more than 4,000m below sea level

process, introduce new business models and technology, and offer opportunities for investment and acquiring new capabilities.

### **CULTURE OF INNOVATION**

The 14th Innovation and Quality Circles (iQC) organised by Keppel FELS saw strong participation from Keppelites with forward thinking ideas that will improve processes in Keppel O&M.

At the closing ceremony held on 22 November 2017, Mr Chris Ong, CEO of Keppel O&M, called on Keppelites to leverage new technologies such as digitalisation and 3D printing. "Some of these ideas may be disruptive to our business model but by identifying them and harnessing them early, we can provide game-changing solutions for our clients," he shared.

The iQC competition, which was themed 'Projects for the sustainable future', saw innovative projects that helped the company achieve time and cost savings. For example, Team iRobot, which won the coveted Star Award, designed and built a robot that can conduct real-time inspections, improving safety in the yard by eliminating the need for workers to perform these checks.

A total of 1 Star Award, 2 Gold Awards, 7 Silver Awards and 5 Bronze Awards were presented to project teams for their outstanding efforts in innovation.

### **MEETING CHALLENGES FOR THE FUTURE**

On 24th Oct 2017, Deputy Prime Minister and Coordinating Minister for National Security Mr Teo Chee Hean visited the Keppel-NUS

Corporate Laboratory to witness the achievements of the university-industry collaboration.

The laboratory was set up in collaboration with the National Research Foundation (NRF) and launched by DPM Teo in November 2013.

The visit included a tour of the robotics and automation workshop, where researchers showcased their inventions such as the coupling arm which can stabilise two independent floating offshore rigs and enhance operational efficiency in harsh environments.

### **REWARDING INNOVATION**

On 30 November 2017, BrasFELS held its annual Innovation and Safety Award Ceremony to recognise employees who participated in the INOVE programme and Keppel O&M Innovation Awards.

The INOVE programme, an annual innovation competition organised by BrasFELS, saw strong participation from 13 teams who sought to create new and innovation solutions to increase efficiency and productivity at the yard.

The most prestigious Star Award was presented to team Girando e Inovando. Their Cable Drum Spinner reduced the number of employees and man-hours

*Continues on page 20...*

Continued from page 19.

required to transfer cables from storage coils to the cutting reels, and achieved time savings of close to 63%.

At the annual Keppel O&M Innovation Awards held on 2 October 2017, half of BrasFELS projects won special recognition or bronze awards. Winning the bronze award was an innovation which allowed the upper raiser balcony of the FPSO P-69 to be installed in BrasFELS, improving workflow and enhancing efficiency.



Mr Marlin Khiew (centre), CEO and President of Keppel FELS Brasil, with the winners of the INOVE competition

## Shaping young minds

As part of an educational tour, 20 students from the Institute of Technical Education (ITE) Ang Mo Kio in Singapore visited Keppel Nantong, Keppel Offshore & Marine's (Keppel O&M) shipyard in China, on 8 January 2018.

Led by Mr Azahari Mohamad

Yusuf, Senior Lecturer, Maritime Business & Human Resource, ITE and Capt. Sunny, Senior Operation Manager, Singapore Nantong International Maritime Institute (SNIMI), the students were on a 7-day educational tour of the Nantong Economical Development Zone in China.

Joint organised by ITE and SNIMI, the tour was held in collaboration with Nantong Shipping College, a long-term partner of Keppel Nantong.

During the visit, the students and teachers were introduced to Keppel Nantong as well as how it operates under the Keppel O&M group. After the introduction, they were given a tour of the yard and its facilities, including the engineering office and safety training centre, to better understand the operating and safety culture in the yard.



Students were introduced to operations and safety procedures in the yard before embarking on the yard tour



# Regional friendships

In commemoration of RISING50, which marks 50 years of diplomatic ties between Singapore and Indonesia, the National Youth Council, in partnership with the Ministry of Youth & Sports Indonesia, organised the inaugural Singapore-Indonesia Youth Leaders Exchange Programme from 12-18 November 2017.

Keppel Offshore & Marine (Keppel O&M) was proudly represented by Mr Wong Zi Hao, Executive, Marketing (Special Projects), Keppel Singmarine, who was part of the Singapore delegation consisting of 20 representatives from the public, private and people sectors.

Over the course of six days,



Wong Zi Hao (centre), with Ms Grace Fu (left), Minister for Ministry for Culture, Community and Youth (Singapore), and Dr Jonni Mardizal (right), Deputy Minister, Ministry of Sports and Youth (Indonesia) at the closing ceremony held on 17 November 2017

representatives from both countries engaged in substantive dialogues on a wide range of topics such as bilateral relations, socio-economic challenges, smart nations, and social enterprises.

“This exchange programme has enhanced my understanding and

appreciation for national policies, current systems, bilateral relations and regional development strategies of both countries. It was an invaluable learning experience and I look forward to maintaining the new friendships that were formed,” Zi Hao shared.

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# Supporting the Labour Movement

In support of the Labour Movement (LM), Mr Chris Ong, CEO of Keppel Offshore & Marine (Keppel O&M), and delegates of Keppel FELS Employees Union (KFEU) participated in LM Conversations 2017, which was organised in conjunction with the National Trade Union Congress (NTUC) Ordinary Delegates’ Conference (ODC) 2017.

Held on 15 November 2017, LM Conversations featured a series of dialogue sessions involving different stakeholders, including union leaders, management

representatives from unionised companies, as well as ministers from different ministries.

Mr Chan Chun Sing, Minister in the Prime Minister’s Office and Secretary-General of NTUC, revealed that trade unions will continue to play an important role in helping to translate the 23 Industry Transformation Maps (ITMs) for the future economy.

“All the industry transformation maps at the highest level will not create any miracles until we translate them down to each

individual and company. That is why NTUC will organise all our unions and U Associate into the 23 ITM clusters to make sure we support the work of each ITM to translate them into better jobs and better skills for workers. That is our commitment to the tripartite partners and we look forward to working with them to bring this about,” he shared.

A strong supporter of the Labour Movement, Keppel O&M actively engages its unions to maintain productive partnerships and a motivated workforce.

# Developing the next generation

People development is an integral part of operations at Keppel Offshore & Marine (Keppel O&M), and significant investment goes into providing platforms through partnerships with academic institutions such as the Institute of Technical Education (ITE) and Singapore University of Technology and Design (SUTD) to nurture the workforce to their fullest potential.

### GRADUATION CEREMONY

On 12 January 2018, 20 Keppelites were recognised for successfully completing their respective training programmes. Six graduates completed their National ITE Certificate (NITEC) and

higher NITEC education under the Technical Associates Traineeship Programme, while seven Keppelites graduated under the Employee Development Scheme with higher NITEC, Bachelor's and Master's qualifications.

In addition, seven students who were offered scholarships by Keppel O&M graduated from various academic institutions including ITE, Nanyang Technological University, SUTD and Newcastle University.

During the congratulatory ceremony, Mr Chris Ong, CEO of Keppel O&M, emphasised the

importance of skills upgrade. "It is important that our Keppelites continue in the quest for knowledge and equip themselves with new competencies, skills and knowledge to be ready for the future and bring about changes to the organisation," he shared.

### KTED PROGRAMME

On 17 November 2017, 37 Keppelites graduated from the Keppel O&M Technology and Engineering Development (KTED) programme jointly organised by Keppel O&M and SUTD.

Held for the second time since its inception in 2015, the programme



Keppel O&M management recognised the hard work of graduates at the congratulatory ceremony held on 12 January 2018



The KTED graduation ceremony was attended by management from Keppel O&M and SUTD including Mr Chris Ong, CEO of Keppel O&M, and Professor Chong Tow Chong, Acting President & Provost, SUTD





Keppel O&M was represented by Mr Chris Ong (third from left), CEO of Keppel O&M, at the launch of the SUTD Academy which was witnessed by Mr Ong Ye Kung (sixth from left in front row), Minister for Education (Higher Education and Skills) and Second Minister for Defence

exposes participants to exciting topics such as sustainable engineering, designing service robots, virtual and augmented reality, and using big data for design.

Participants also formed teams to brainstorm and present new business ideas. One such idea, presented by project team 1KG, proposed the creation of a sustainable arctic living environments on offshore platforms by leveraging on Keppel's experience in sustainable eco cities, track record in offshore platforms and offshore support vessels, as well as technologies such as water desalination and offshore power generation.

The programme received positive feedback from Keppelites. Yew Teik Kheng, Assistant Project Manager, Keppel Shipyard, shared, "The KTED programme has

taught me that design thinking or innovation can be achieved in a systematic way through proven techniques and models. This is very much applicable to our workplace where we are constantly looking at ways to improve our business."

#### MOU WITH SUTD

Keppel O&M has strengthened relations and signed a Memorandum of Understanding (MOU) with SUTD as part of the launch of the SUTD Academy, which aims to encourage continuous learning and upgrading of professionals, managers and executives.

The SUTD Academy will adopt a unique partnership model with various organisations to co-develop customised programmes to keep participants up-to-date with the latest technological developments and help them stay relevant in the evolving job market.

#### LAUNCH OF ITE WLTD

Keppel O&M was amongst the pioneer batch of 13 companies to partner ITE in the newly launched ITE Work-Learn Technical Diploma (WLTD) which will create new skills upgrading and career progression opportunities for ITE graduates.

The signing ceremony for the launch of the WLTD was held on 13 November 2017 and witnessed by Mr Ong Ye Kung, Minister for Education (Higher Education and Skills) and Second Minister for Defence. Four WLTD programmes, including marine & offshore engineering, will be launched in April 2018.

# In it to win it

Rivalries between the Atlantic, Caspian and Pacific teams reached scorching levels as teams battled neck and neck in the netball, badminton, volleyball and basketball matches.

On 8 October 2017, the three teams pitted their shooting skills against one another in the highly-contested netball challenge. Team Pacific claimed the street division champion trophy, but were edged out in the mixed division by Team Atlantic after a nail-biting first match which ended in a draw. Despite this, Team Pacific withstood pressures from the other teams to claim the Netball Challenge Trophy.

Tensions rose again on 29 October 2017 at the badminton challenge as spectators were treated to long rallies and spectacular smashes. Team Atlantic overcame their opponents to emerge with three gold medals and the coveted Badminton Challenge Trophy.

The teams crossed swords again at the volleyball challenge held on 5 November 2017. Team Pacific, who was regarded as the dark horse, drew first blood in the match against Team Caspian. However, defending champion, Team Atlantic, held their ground in subsequent matches to clinch the Volleyball Challenge Trophy.

Teams locked horns on the basketball court on 14 January 2018. Team Caspian's commendable teamwork earned them the title for the male

TEAM	GOLD	SILVER	BRONZE
ATLANTIC	9	4	5
CASPIAN	7	5	9
PACIFIC	5	12	7

Score Board: Total medal tally as at 15 January 2018



Team Caspian (in blue) and Team Atlantic (in red) in a closely fought basketball match



Team Atlantic (in red) overcame strong performances from their opponents to clinch the coveted Badminton Challenge Trophy

category and the Basketball Championship Trophy.

anticipated Dragon Boat race. Stay tuned!

The Keppel Games will continue with tennis and the highly



# Celebrating strong ties

On 16 November 2017, over 140 former Keppelites celebrated friendship and strong ties at the Keppel Offshore & Marine (Keppel O&M) Alumni Dinner.

The event, themed 'Happy Memories', kicked-off with a short walk down memory lane at the historic docks along Keppel Bay. The evening's activities continued at the Keppel Leadership Institute where participants enjoyed activities, including an exhibition of paintings of Keppel's shipyards by Mr Chung Chee Kit and a sharing session by Mr Seow Tiang Keng, who spoke on his 45 years working in Keppel.

Mr Loh Chin Hua, CEO of Keppel



Over 20 former Keppelites participated in a walk down memory lane at the historic docks along Keppel Bay. The walk was led by Mr Hoe Eng Hock, President of Keppel O&M Alumni

Corporation and Chairman of Keppel O&M, acknowledged the significant contributions of Keppel O&M alumni members in building up the company over the years.

"The fierce passion and strong ties

among Keppelites have helped the company grow from strength to strength. We would not be where we are today, if not for the contributions and sacrifices of pioneers like yourselves," he shared.

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# Brazilian melodies



Celebrating the friendship between Brazil and Singapore at PianoBotanica were (from L-R) Mr Paul Tan, Group Controller, Keppel Corporation and CFO, Keppel Offshore & Marine; Mr Flávio Soares Damico, Brazil's Ambassador to Singapore; and Mr Ho Tong Yen, GM of Group Corporate Communications, Keppel Corporation

Thousands of park goers enjoyed an evening of charming Brazilian music amidst the lush greenery of the Singapore Botanic Gardens, as Brazil and Singapore marked 50 years of diplomatic relations with a special fifth edition of PianoBotanica. Held on 4 November 2017, PianoBotanica is an annual outdoor concert that celebrates friendship between the two countries.

Keppel Offshore & Marine (Keppel O&M) was once again the presenting sponsor of the classical music event. This year's concert saw performances by Singapore's

bossa nova and jazz maestro Jeremy Monteiro, as well as guest performances by Juliana da Silva – Melissa Tham & Jazz Brasileiro.

Separately, Keppel O&M also sponsored the Keppel Latin American Film Festival, held from 7 to 10 December 2017. The festival screened 10 films from Argentina, Brazil, Colombia, Costa Rica, Chile, Cuba, Mexico, Panama, Peru and Venezuela at the National Gallery Singapore for free. Organised by the embassies in Singapore, the festival, which showcases Latin American culture, has gained a strong following over the years.

# Corporate citizenship

BrasFELS actively engages with different stakeholders to do its part for the local community.

On the environmental front, BrasFELS employees participated in a beach Clean Up Day organised by the surf club of Angra dos Reis, Brazil, on 16 September 2017.

Taking to Amendoeira Beach at Gipoia Island, the volunteers removed approximately 500kg of garbage from the beach.

A worldwide campaign for environmental preservation, the Clean Up day focuses on initiatives such as the cleaning up of beaches and rivers.



As part of Clean Up Day, volunteers removed approximately 500kg of garbage from the Amendoeira Beach at Gipoia Island

In addition, BrasFELS works closely with the Port Authority of Angra dos Reis on maritime safety and security in the region. On 6 November 2017, Mr Marlin Khiew, President & CEO of Keppel FELS Brasil, and Airton Rodrigues, Assistant Operations Manager of BrasFELS, received certificates from

the office of the Port Authority in recognition of their contributions.

BrasFELS supports the Port Authority of Angra dos Reis with resources such as equipment maintenance, landing tugboats and floating cranes during emergencies.

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## Going the extra mile

Volunteers from Keppel FELS rallied to care for underprivileged households by participating in Food from the Heart's food distribution programme on 18 November 2017.

Prasanna Balaji Gopalakrishnan, Assistant Construction Manager, Production, Keppel FELS, reflected, "Based on the feedback of beneficiaries from previous visits, we provided more nutritious

items like eggs and fruits, as well as separated Halal and non-Halal food items. I am proud to be part of a team that is willing to go the extra mile."



Volunteers and elderly patients bonded over making handicrafts

Separately, volunteers from Keppel FELS brought festive cheer to patients at Yishun Community Hospital on 21 December 2017, where patients and volunteers bonded over making handicrafts together.

Shared Linda Ong, Volunteer Coordinator at Yishun Community Hospital, "The patients found today's session enjoyable as the activities were engaging, yet simple."

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# Preferred partner

Keppel Offshore & Marine (Keppel O&M) announced on 11 December 2017 that its wholly-owned subsidiaries, Keppel FELS Brasil and Keppel Shipyard, secured projects from repeat customers, Petrobras and SOFEC Inc. (SOFEC) respectively.

Mr Chris Ong, CEO of Keppel O&M, said, "We are pleased that our repeat customers continue to choose us as the preferred partner for their Floating Production Storage and Offloading (FPSO) projects. It is a testament to our proven track record and expertise in a comprehensive range of services and proprietary technology for production assets. We are committed to delivering innovative, reliable and value-added solutions for the industry."

Keppel FELS Brasil's BrasFELS shipyard has secured hull carry over work for the FPSO unit P-69 from Tupi BV (a consortium formed by Petrobras Netherlands B.V., operator with 65%; Shell with 25%; and Petrogal Brasil with 10%), which is represented by Petrobras.

The additional work scope on P-69 includes the installation of equipment and cables for the hull as well as the commissioning of marine systems.

BrasFELS was initially contracted to undertake the fabrication, integration, testing and commissioning of the topside modules for P-69. The yard has since completed module fabrication for P-69, and is currently undertaking integration

and commissioning of the topside modules.

P-69 is scheduled to depart BrasFELS in 2018 for the Santos Basin pre-salt region. When delivered, it will have a production capacity of 150,000 barrels of oil per day and 6 million cubic metres of gas per day. It will also have a storage capacity of 1.6 million barrels of oil.

Keppel Shipyard's contract from SOFEC is for the fabrication of a Turret Mooring system for a newbuild Floating Liquefied Natural Gas (FLNG) vessel bound for the Coral South FLNG Project in offshore Mozambique. Fabrication is scheduled to commence in 1Q 2018 with delivery of the turret components expected in 1Q 2020.



Keppel O&M's proven track record has helped to position the company as the preferred partner for FPSO and FLNG projects