

OFFSHORE MARINE

A newsletter of Keppel Offshore & Marine

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TRAILBLAZING LNG SOLUTIONS



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Mr Chris Ong, CEO of Keppel O&M, addressed key executives from around the world at the company's biannual strategy meeting

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OffshoreMarine is a quarterly publication of Keppel Offshore & Marine Ltd
50 Gul Road, Singapore 629351
Tel: +65 6863 7200
Fax: +65 6261 7719 / 6265 1927

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Building capabilities, capturing opportunities

Despite the challenging environment, Keppel Offshore & Marine (Keppel O&M) has performed creditably by seizing pockets of opportunities in niche markets. *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 1Q 2018 results webcast on 19 April 2018.

Markets have been roiled in recent weeks by concerns over rising trade tensions between the US and China as well as the situation in the Middle East. However, the global economy continues to enjoy broad-based growth, with improved business sentiments in both advanced economies and emerging markets. Strong urbanisation trends continue to present many opportunities for the Keppel Group across our businesses.

Against this shifting backdrop, the Keppel Group remains resilient, underpinned by our multi-business strategy, and continues to pursue opportunities as a provider of solutions for sustainable urbanisation.

OPERATIONS REVIEW

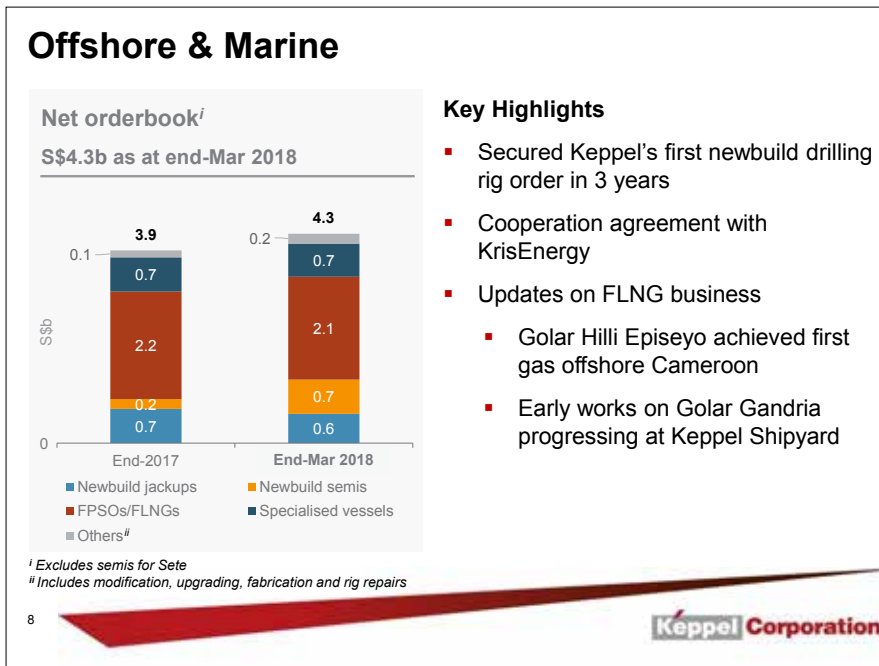
We are seeing increasing confidence in the offshore and marine business, underpinned by rising oil prices. While there are pockets of opportunities in niche markets, it may take some time before we can see sustained recovery across the board. The jackup market continues to be plagued by a supply overhang, with both utilisation and day rates remaining soft.



Keppel FELS delivered SAGA, the first of five jackup rigs to Borr Drilling in January 2018

Continues on page 4...

Continued from page 3.



Key Highlights

- Secured Keppel's first newbuild drilling rig order in 3 years
- Cooperation agreement with KrisEnergy
- Updates on FLNG business
 - Golar Hilli Episeyo achieved first gas offshore Cameroon
 - Early works on Golar Gandria progressing at Keppel Shipyard

KEY HIGHLIGHTS

Keppel O&M's net orderbook as at end-March 2018 stood at \$4.3 billion compared to \$3.9 billion at the end of 2017.

Earlier this month, we announced a cooperation agreement among Keppel FELS, Keppel Shipyard and KrisEnergy where Keppel, as the preferred contractor, will offer KrisEnergy a comprehensive suite of offshore oil and gas solutions.

In March, Hilli Episeyo, the world's first converted floating liquefaction vessel which Keppel built in partnership with Golar, achieved first gas in offshore Cameroon. With the successful first production, the market is gaining increasing confidence in converted Floating Liquefied Natural Gas solutions. Golar has reported that the proof of concept in Hilli Episeyo is expected to speed up and open a wider variety of financing alternatives for the Fortuna project where the second converted FLNG vessel, Gandria, will be deployed. The vessel has since been moved from layup and is currently in Keppel Shipyard for early works.

CAPTURING OPPORTUNITIES

As we had announced previously, Keppel O&M is taking advantage of the downturn to streamline operations, build new capabilities and capture new markets. To help our customers improve operational efficiency and lower costs across the project life cycle, Keppel O&M is developing rigs of the future

Due to the reduced volume of work and our share of associated companies' losses, Keppel O&M made a loss of \$23 million for 1Q 2018. Operating profit for the Division was \$8 million in this quarter, slightly higher than the \$4 million in 1Q 2017.

Despite the challenging environment, Keppel O&M secured new contracts worth about \$580 million year to date. This includes a contract to build a mid-water harsh environment semisubmersible worth about US\$425 million for Awilco Drilling, with options to build three similar units, to be exercised progressively over 36 months.

Securing the order from Awilco is a significant milestone as it is our first newbuild drilling rig order since the start of the downturn

in 2014. It also demonstrates that despite the downturn, the industry continues to have a preference for high specification rigs to be built by a reliable partner.

Earlier this month, we also announced a new order for a dual-fuel bunker tanker. This is the seventh dual-fuel LNG powered vessel to be built by Keppel O&M, which is testament to our ability to provide compelling solutions across the gas value chain.

In January, Keppel O&M delivered the first of its five jackup rigs novated to Borr Drilling last year. The first rig, SAGA, built to our proprietary KFELS Super B Class design, was delivered safely, on time and on budget. We are on track to deliver the second rig to Borr Drilling later this year.

through increasing digitalisation, utilising smart sensors, capturing and analysing data, and offering enhanced solutions. With these rigs, we aim to transform the current operating environment to become more efficient and versatile, without compromising on safety.

To push out these innovations, Keppel O&M is also developing yards of the future, by

incorporating robotics and AI into our manufacturing process.

Our end-to-end gas strategy will also unveil new opportunities for the Group, taking us beyond a shipyard's regular turnkey business model to become a developer, owner and operator of floating energy infrastructure. With proven cryogenic expertise and the ability to stitch up the entire gas value chain, we are well placed

to address this growing market segment. Keppel O&M also seeks to play a part in the electrification of archipelagic states using our proprietary floating LNG solutions.

As oil and gas majors are gradually shifting their business focus to renewables, we are also actively considering expansion into this space.

IN CONVERSATION

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

Q: Is further restructuring required in the Offshore & Marine (O&M) Division?

LCH: As shared previously, we have gone through a lengthy rightsizing exercise, starting from early 2015. We believe that Keppel Offshore & Marine (Keppel O&M) is now about the right size.

In 1Q 2018, despite the fact that the Division's quarterly revenue

was one of the lowest in a number of years, we still had a small operating profit.

For now, the key is to look for new revenue growth and new orders. The contract with Awilco for the harsh environment mid-water semisubmersible is an important win for us. We will continue to hunt for new projects while watching the restructuring closely.

Q: Could you provide an update on the Can Do drillship? Have there been any enquiries for the vessel?

CO: The Can Do drillship is under construction and final stages of testing. It is scheduled to be ready for the market in 4Q 2018. We are currently talking to a few of our customers on the vessel.

Q: Sete Brasil could resume the construction of some drilling rigs following its settlement with Petrobras. How quickly will you be able to resume construction of the units?

CO: While Petrobras has approved the main terms for a possible agreement with Sete Brasil, the details of this agreement are still to be negotiated. We will provide updates if there is further news.

LCH – Mr Loh Chin Hua,
CEO of Keppel Corporation

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



The Can-Do drillship is scheduled to be ready for the market in 4Q 2018

Supporting sustainable urbanisation

At the start of the year, Keppel Corporation refreshed its mission to emphasise that Keppel is not just a group of companies in diverse industries sharing a common name, but an eco-system of companies working closely together, with a common purpose to provide compelling solutions for sustainable urbanisation. In a message to employees, Mr Chris Ong, CEO of Keppel Offshore & Marine (Keppel O&M) elaborated on how Keppel O&M fits into this overarching mission. Extracts of the message are reproduced below.

Urbanisation is a macro trend that is impacting countries all over the world. More than 55% of the world's population live in cities, and this number is expected to rise further over the coming decades. Urban centres require a wide range of infrastructure solutions and also account for 70% of global energy consumption, with an increasing focus on renewables and cleaner sources of energy.

Keppel O&M is supporting this macro trend by helping to meet the demand for energy through oil and gas E&P solutions where our rigs and production vessels are used, as well as through our other products that address transportation, infrastructure, renewables and other needs.

In addition, we are enabling the use of cleaner sources of energy with a comprehensive suite of solutions across the gas value chain. Through our proprietary floating LNG solutions, we have delivered the world's first converted floating liquefaction vessel and floating regasification unit, as well as developed LNG-fuelled vessels. We are also exploring opportunities in the electrification of remote regions

in archipelagic states or along waterways, which are unserved by pipelines, through our small-scale LNG solutions. In the renewable energy space, we are supporting offshore wind farm developments as well as exploring other solutions.

We are also refining our offerings by leveraging our offshore expertise to develop floating infrastructure solutions, which may provide more viable and efficient alternatives to land based solutions. Examples range from floating data centres and desalination plants to near shore urban developments, which can be

developed in collaboration with other business units in the Keppel Group.

We will also harness technology to continue to enhance the sustainability and efficiency of our products, to better meet the evolving needs of the market.

Let us continue to work towards realising Keppel O&M's Vision to be the provider of choice and partner for solutions in the global offshore and marine industry, in support of the broader Keppel Group's Mission to be a solutions provider for sustainable urbanisation.

KEPPEL GROUP'S VISION & MISSION

A global company at the forefront of our chosen industries, shaping the future for the benefit of all our stakeholders – Sustaining Growth, Empowering Lives and Nurturing Communities.

Guided by our operating principles and core values, we will deliver solutions for sustainable urbanisation profitably, safely and responsibly.

KEPPEL O&M'S VISION & MISSION

Our vision is to be the provider of choice and partner for solutions in the global offshore and marine industry.

We seek to achieve customer satisfaction through technological leadership and in building a people oriented organisation.

BW ADOLO nears delivery

On 5 April 2018, Keppel Offshore & Marine (Keppel O&M) celebrated the naming of the Floating Production Storage Output (FPSO) vessel BW ADOLO. Having converted the vessel from a tanker in 2007, Keppel Shipyard this time worked closely with BW Offshore on the upgrading and modification of the BW ADOLO to ensure it fulfils the requirements of the Dussafu field.

In his opening address, Mr Chris Ong, CEO of Keppel O&M, touched on the close working relationship shared between Keppel O&M and BW Offshore.

"I am glad to note that through this project, our partnership with BW Offshore has moved up yet another notch. The expertise of both companies, as well as our close partnership forged over many

past projects, has enabled the smooth execution of work on the BW ADOLO."

"BW ADOLO marks the thirteenth FPSO project that Keppel is delivering to BW Offshore, and we look forward to future collaborations soon."

Held at Keppel Shipyard, the naming ceremony's Guest-of-Honour was Mr Pascal Houangni Ambouroué, Gabon Minister of Petroleum and Hydrocarbons.

Having undergone upgrading, the BW ADOLO now has a production capacity of 40,000 barrels of oil per day. Through the hardwork and perseverance of the BW Offshore and Keppel Shipyard project teams, a safety record of more than 1.2 million man-hours without any Lost Time Injury-to-date was achieved.

Previously situated in the Azurite field in the Republic of Congo, the BW ADOLO will now operate in the Tortue oil field located offshore Gabon, with first oil planned in the second half of 2018.

The BW ADOLO will be Keppel O&M's fifth project for Gabon, having delivered an FPSO and three Floating Storage Output (FSO) units previously for deployment.



The naming ceremony for BW ADOLO was graced by Guest-of-Honour, His Excellency Mr Pascal Houangni Ambouroué (second from left in front row), Gabon Minister of Petroleum and Hydrocarbons, and attended by management from BW Group, Panaro Energy and Keppel O&M, including Mr Chris Ong (first from left in front row), CEO of Keppel O&M

Developing autonomous vessels

As part of its digitalisation drive, Keppel Offshore & Marine (Keppel O&M) has signed a Memorandum of Understanding (MOU) with the Maritime Port Authority of Singapore (MPA) and the Technology Centre for Offshore and Marine, Singapore (TCOMS) on 25 April 2018 to jointly develop autonomous vessels for a variety of applications including undertaking harbour operations such as channelling, berthing, mooring and towing operations.

In the context of ports, the development and application of remote or autonomous vessels could potentially automate operations and enhance safety and productivity. Such developments and pilot projects will contribute to Singapore's experience and act as demand drivers for local capability development in selected areas.

Mr Andrew Tan, Chief Executive of MPA, said, "Our partnership with Keppel O&M and NUS TCOMS allows us to test the operations of autonomous vessels such as harbour tugs in our port waters as well as the interface between such vessels and our future vessel traffic management systems. As one of the world's busiest ports, Singapore provides an excellent test-bed for autonomous systems which will have to meet the highest standards of safety and security."

Keppel O&M will use its remote vessel monitoring and analytics programme, VesselCare™, as the base platform in the initial



The signing of the MOU was witnessed by Dr Lam Pin Min (standing in centre), Senior Minister of State, Ministry of Transport & Ministry of Health

phase to develop autonomous vessels. VesselCare™ is able to perform data consolidation, condition based monitoring and maintenance, mining and analytics of vessels.

Mr Chris Ong, CEO of Keppel O&M said, "As a leader in the design and construction of specialised vessels, we have been developing advanced remote monitoring and analytics systems for vessels. The industry is keen to explore the commercial use of autonomous vessels as there are multiple safety, efficiency and cost benefits. This partnership demonstrates Keppel O&M's commitment to be at the forefront of research and provide the latest cutting-edge technologies to our customers."

During the advanced stages of monitoring and controlling a vessel, the project will develop a Digital Twin of the tug which will simulate vessel behaviour

to help optimise the vessel operations using data analytics and visualisation tools. TCOMS will provide expertise in coupled physical-numerical modelling and simulation to evolve solutions that improve on the predictability and control of the behaviour and response of the vessel.

Prof. Chan Eng Soon, CEO of TCOMS, added, "The behaviour of marine vessels in challenging operating conditions is complex and to some extent still poorly understood. This is one key technical challenge that we seek to address, to ensure that autonomous vessels could operate safely and reliably while enhancing efficiency and productivity."

Transforming industry



Then Minister for Trade and Industry (Industry), Mr S Iswaran (eighth from left) launched the Marine & Offshore Engineering Industry Transformation Map together with key industry partners, including Mr Chris Ong (fourth from left), CEO of Keppel O&M, and Mr Abu Bakar (seventh from left), President of ASMI and MD(Gas and Specialised vessels) of Keppel O&M

To propel Singapore's offshore and marine industry to its next phase of growth, the Economic Development Board (EDB) launched the Marine & Offshore Engineering Industry Transformation Map (ITM) to generate some \$5.8 billion of value-add and create 1,500 jobs by 2025.

The ITM was launched by then Minister for Trade and Industry (Industry), Mr S Iswaran on 22 February 2018 in conjunction with the establishment of an ITM Programme Office within the Association of Singapore Marine Industries (ASMI). As a leader in Singapore's maritime industry in Singapore, Keppel Offshore & Marine (Keppel O&M) is a key participant in the ITM.

Mr Chris Ong, CEO of Keppel O&M said, "We are pleased to be part of the ITM as it is an important

initiative for the industry to prepare for the future. At Keppel O&M, we are leveraging innovation and technology to enhance our value proposition. For instance, we are diversifying our product offerings to include solutions across the gas value chain and in renewable energy. We are also incorporating digitalisation through our Asset Care service offerings that will provide real time monitoring and analytics to our customers in optimising the operations of their rigs or vessels. In our yards, we are improving our processes and productivity through robotics and 3D printing, while upskilling our people to take on new work."

Minister Iswaran said at the launch, "Another opportunity lies in diversification into new growth areas, such as Liquefied Natural Gas (LNG) and offshore renewables. In October last year,

Keppel O&M leveraged its existing capabilities to carry out complex offshore conversion projects and deliver the world's first converted Floating Liquefaction Vessel. Given their prominent position in the global M&OE eco-system, our LLEs (large local enterprises) can lead the way in restructuring and diversifying."

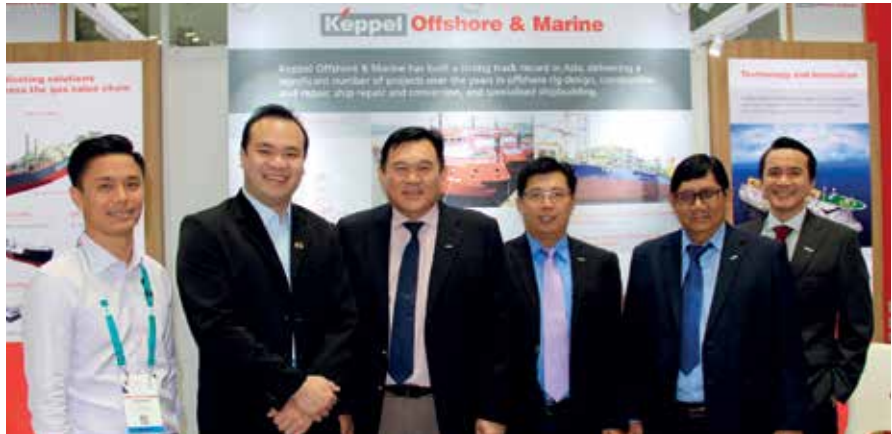
Keppel O&M actively participates in industry initiatives that help to propel the offshore and marine industry forward. Another example is Workforce Singapore's Professional Conversion Programme (PCP), which allows professionals to undergo skills conversion and move into new sectors that have opportunities for progression. The 6-month marine PCP provides classroom training and well as structured on-the-job training with shipyards including Keppel O&M.

Showcasing capabilities

Billed as the Asia edition of Offshore Technology Conference's (OTC) annual flagship conference held in Houston, OTC Asia is a biennial event that gathers more than 25,000 industry professionals from 2,500 organisations across 80 countries.

Keppel Offshore & Marine (Keppel O&M) showcased its suite of innovative solutions and explored new opportunities at the most recent instalment held in Kuala Lumpur from 20-23 March.

The conference explored pertinent industry issues such as how Asia should maintain its resilience and responsiveness in a dynamic energy market, the impact of big data



The Keppel O&M team led by Mr Chor How Jat (third from left), MD, Conversions and Repairs, Keppel O&M, networked with customers and partners such as Mr Lim Chern Yuen (second from left), Group CEO of Yinson Holdings, at OTC Asia 2018

on the offshore energy industry, as well as the application of technologies from other industries on that of oil and gas.

With its extensive capabilities

and track record in newbuild rigs and specialised vessels, vessel conversion and repair, as well as solutions along the gas value chain, Keppel O&M is well-placed to meet the challenges head on.

Strategy for the future

New technologies are rapidly changing the business landscape and companies need to adapt and plan for the future. Armed with the determination to take the Group on the next lap, senior management and key executives from Keppel Offshore & Marine's (Keppel O&M) business units around the world convened in Singapore for its biannual strategy meeting in February to take stock of its progress and discuss strategic issues and direction of the Group.

Addressing Keppelites, Mr Loh Chin Hua, CEO of Keppel

Corporation and Chairman of Keppel O&M, expressed confidence in the bright future of Keppel O&M and the new ideas adopted by the next generation of leaders. He also highlighted that with the changing landscape in the oil and gas industry due to disruptors such as shale, the Group cannot just continue doing what made it successful in the past, and that everyone should work together to develop and innovate new solutions for the future.

Summing up the session, Mr Chris Ong, CEO of

Keppel O&M, spoke about the headway made by the Group in its new businesses such as the gas strategy and the Jones Act market while continuing to capture opportunities in its core products where it secured most of the floating production tenders in 2017. Keppel O&M is leveraging technology and embarking on digitalisation to further increase the quality of services and improve operations. It is also entering new markets such as renewables and the repurposing of offshore technologies.

Marking a milestone

Mozambique's first offshore development, the Coral Sul Floating Liquefied Natural Gas (FLNG) project, marked an important milestone on 8 March 2018 with Keppel Shipyard cutting first steel for the fabrication of turret components for the FLNG vessel.

In his welcome speech, Mr Albert Kee, ED (Operations), Conversions & Repairs, Keppel Shipyard, said, "We have a strong track record in the fabrication of turret and mooring systems and look forward to delivering to SOFEC and Mozambique a high-quality turret, safely and on time.

"We are pleased that our longstanding customers continue to entrust their projects with us.



Representatives from the Coral Sul's various stakeholders including ENI, SOFEC, TechnipFMC and Keppel Shipyard attended the strike steel ceremony

This is our fourth project with SOFEC, and we have also worked on multiple projects belonging to ENI in recent years. I am glad that we have established a productive relationship based on teamwork, trust and a common set of values, including a shared commitment to safety excellence and engineering precision."

The FLNG will be designed to produce 3.4 metric tonnes per annum of LNG and will be moored in 2,000 metre water depths off Mozambique. The turret allows the FLNG facility to continually rotate into prevailing weather without production interruptions. Delivery of the turret components is expected in 1Q 2020.

Growing LNG track record

Keppel Offshore & Marine (Keppel O&M) has extended its track record as a provider of solutions for the gas value chain. It marked another milestone on 24 March 2018 with the keel laying for two 7,500 m³ dual-fuel LNG carriers that Keppel

Singmarine will be building for Stolt-Nielsen Gas B.V (Stolt-Nielsen Gas).

The ceremony at Keppel Nantong was attended by representatives from Stolt-Nielsen Gas, Keppel

Singmarine, as well as classification society DNV GL. To be completed in 2Q and 3Q 2019 respectively, the LNG carriers will have a class notation for bunkering which adds to their versatility to not only transport LNG but also provide bunkering services if required.



The keel laying ceremony for the two LNG carriers for Stolt-Nielsen Gas took place at Keppel Nantong on 24 March 2018

There is growing demand for small-scale LNG carriers, especially for end users located in remote areas not served by pipelines. Tighter regulation on emissions continues to encourage growth in small-scale LNG projects which are economical and quick to market.

Building partnerships

Keppel Offshore & Marine (Keppel O&M) regularly engages external organisations, including government agencies and statutory boards, to explore opportunities for collaboration and share best practices to push the industry ahead.

VISIT BY INDONESIA MINISTER OF TRANSPORT

On 21 March 2018, Mr Budi Karya Sumadi, Minister of Transport from the Republic of Indonesia, visited Keppel O&M and was hosted by Mr Abu Bakar, MD (Gas & Specialised Vessels), Keppel O&M.

The Minister was in Keppel with his entourage of government and business leaders to explore potential collaborations for Indonesia's maritime highway. Indonesia is made up of 18,000 islands and is looking to increase connectivity with more large ships and harbours with modern facilities. There are also some 26,000 of Indonesian vessels that will require regular maintenance and repairs.

As a leader in specialised shipbuilding, shiprepair and expertise in maritime infrastructure products, Keppel O&M is well-positioned to support Indonesia's maritime growth. Minister Budi Karya Sumadi was given a tour of the shipyard and a presentation on the yard's capabilities.

Keppel O&M has good relationship with Indonesia, having delivered several projects for them over the years. It is currently in discussion

on the development of small-scale LNG distribution in West Indonesia.

SAFETY VISITS

In January 2018, Keppel O&M hosted officials from Bangladesh's Ministry of Manpower as well as safety committee members from the Association of Singapore Marine Industries (ASMI) to a tour of the Keppel Shipyard to share the company's safety initiatives.

A month later, a delegation from the Public Utilities Board (PUB) Singapore led by Mr Ng Joo Hee (sixth from left), CEO of PUB, visited Keppel Shipyard and the Safety Training and Welfare Centre, where the Keppel team shared the company's safety journey as well as the importance of workers' safety and wellbeing.



Mr Budi Karya Sumadi (second from left), Minister of Transport from the Republic of Indonesia, and his delegation were hosted by Mr Abu Bakar (third from right), MD (Gas & Specialised Vessels), Keppel O&M and shown the capabilities of the shipyard to meet Indonesia's maritime needs



The PUB delegation was led by Mr Ng Joo Hee (sixth from left), CEO of PUB, and hosted by Keppel O&M management including Mr Abu Bakar (fifth from right), MD (Gas & Specialised Vessels), Keppel O&M

Close working ties

Led by Executive Director of Development of Production and Technology, Hugo Repsold Júnior, a delegation from Petrobras visited BrasFELS on 24 March 2018 to have a first-hand look at the progress of FPSO P-69, BrasFELS' second Replicant project for Petrobras.

The delegation was warmly welcomed by senior management including Mr Marlin Khiew, CEO and President of Keppel FELS Brasil, and Mr Herman Effendy, President of BrasFELS.

Mr Repsold also took the opportunity to present BrasFELS with a plaque for winning first place in the corporate category of the Projeto e PMO do Ano 2017 (Project of the Year) competition. The winning submission was based on the FPSO P-66 project, which was delivered to Petrobras in February 2017.

Held in November 2017, the Project of the Year competition was organised by Mundo PM Magazine and sponsored by Microsoft and Proseri.

Mr Edmundo Santos, Project Director of BrasFELS, shared, "The P-66 project was challenging for us, and we are glad to have earned the recognition of our customer Petrobras and institutions such as Mundo PM Magazine. This would not have been possible without the dedication and efforts of staff who were on the project."

Hands and fingers safety

The importance of hands and fingers safety was highlighted at Keppel Shipyard in a campaign held from end-March to end-April 2018. An exhibition area which included games on the prevention of hands and fingers injuries was

attended by more than 6000 personnel.

Mr Yong Chee Min, Director of HSE, Keppel Offshore & Marine said, "Hands and fingers injuries are one of the most common in our

industry. They are the most at risk part of our body as we use them so often. Through this campaign, we aim to reinforce the habit of always having the right protection and looking out for potential hazards whenever work is done using hands and fingers."

Besides the exhibition, workers are encouraged to recite the "Hands-Off Hands-Off Pinch Points, My Hands My Pride" slogan during the daily toolbox meetings as a constant reminder to keep their hands away from potential pinch points.

The campaign also coincided with the National Hands and Fingers Safety Campaign conducted by Workplace Safety & Health Council (WSHC).



Workers at Keppel Shipyard showing their commitment to hands and fingers safety

End-to-end LNG solutions

Since its first Liquefied Natural Gas (LNG) carrier repair in 1990, Keppel Offshore & Marine (Keppel O&M) has developed a suite of solutions across the gas value chain, ranging from upstream liquefaction to downstream power generation.

The past quarter has seen notable events that will further extend Keppel O&M's track record in the gas segment as the industry seeks cleaner fuel alternatives and adopts LNG as a marine fuel.

SINGAPORE'S FIRST DUAL-FUEL BUNKER TANKER

On 9 April 2018, Keppel O&M secured a contract with Mitsui & Co (Asia Pacific) Pte Ltd (Mitsui AP) to build Singapore's first dual-fuel bunker tanker.

Scheduled for delivery in 2H 2019, the bunker tanker will be owned and operated by Sinanju Tankers Holdings Pte Ltd (Sinanju), based

on a finance agreement with Mitsui AP. As part of the contract, Sinanju and Mitsui AP have an option to order a second similar tanker to be exercised within six months from the effective date of the first contract.

Sinanju will receive co-funding of up to S\$2 million to build the vessel as one of the recipients of the Maritime and Port Authority of Singapore (MPA) LNG bunkering pilot programme (LBPP).

Mr Abu Bakar, Managing Director (Gas & Specialised Vessels), Keppel O&M, said, "The dual-fuel bunker tanker will be the third vessel to be built by Keppel Singmarine under the MPA LBPP and the seventh dual-fuel vessel built by Keppel O&M, extending our track record in LNG-fuelled vessels."

The 7,990 DWT dual-fuel bunker

tanker will be the first LNG-fuelled bunkering vessel for Singapore and for Sinanju.

"Sinanju aims to kick start a green initiative for bunker tankers operating in Singapore; for our vessels to emit less air pollutants while boosting the local use of LNG as a bunker fuel. We will be in good stead when embarking in ship-to-ship LNG bunkering as our next milestone," said Mr Ju Kai Meng, Managing Director of Sinanju Tankers Holdings.

Mr Taku Morimoto, CEO of Mitsui AP, shared, "We are truly honoured and delighted to work with Sinanju and Keppel, reputable and leading companies in Singapore, for Singapore's very first dual-fuel bunker tanker project. Singapore, as the world largest bunkering hub is aiming to reduce greenhouse gas emissions by boosting the use of LNG as a marine fuel, and we, as a company serving the LNG industry for decades, would like to contribute further to Singapore's green initiative."

SOUTH EAST ASIA'S FIRST DUAL-FUEL TUG

Keppel O&M marked another significant milestone on 25 April 2018 when it held the naming ceremony for KST Liberty, South East Asia's first dual-fuel tug. The ceremony was graced by Guest of Honour, Mr Loh Ngai Seng, Permanent Secretary at Singapore's Ministry of Transport.



Built to the requirements of classification society, Bureau Veritas, the bunker tanker will deliver marine fuels to ocean-going vessels within local port limits



The naming ceremony was graced by Guest of Honour, Mr Loh Ngai Seng (centre in front row), Permanent Secretary at Singapore's Ministry of Transport, and attended by management from MPA, EDB, Keppel O&M, Shell, Boskalis, Keppel Smit Towage, Bintulu Port, Jurong Port and Singapore LNG Corporation

The 65-tonne bollard pull LNG dual-fuel Azimuth Stern Drive (ASD) tug was built to Keppel's proprietary design which won the Outstanding Maritime R&D and Technology Award at the 2015 Singapore International Maritime Awards.

Mr Loh Ngai Seng said at the ceremony, "Today's christening of KST Liberty marks an important milestone in Singapore's journey to make LNG bunkering available at our port as early as 2020. I congratulate Keppel O&M and Keppel Smit Towage for taking the lead, under MPA's LNG Bunkering

Pilot Programme, to build and operate Singapore's first LNG-fuelled vessel. Such partnerships bring us closer to our goal of cleaner and more sustainable marine fuels."

Mr Abu Bakar, Managing Director (Gas & Specialised vessels) of Keppel O&M, said, "Our award-winning dual-fuel tug design offers more economical operations with efficient fuel consumption; a simplified bunkering process; optimised deck space that increases the safety and comfort of the crew; and ease of operations."

Smart designs were incorporated to enhance the tug's safety and comfort. The LNG fuel is carried in containerised, type-C ISO-certified tanks on the main deck, and refuelling can be done by truck to ship operations or replacing the empty tanks with replenished ones. It is equipped with an innovative and patented LNG vaporiser which is compact and cost-effective.

Mr Romi Kaushal, Managing Director of Keppel Smit Towage added, "This is a state-of-the-art tug, with environmentally-friendly features that exceed the requirements of the International Maritime Organisation's (IMO) global cap of 0.5% on the sulphur content of marine fuel that comes into force on 1st January, 2020. We have built a strong partnership with Keppel over the years who have demonstrated their ability to design and deliver quality vessels that meet our needs."

Shell will be supplying the LNG fuel to KST Liberty while FueLNG, a joint venture between Keppel O&M and Shell Eastern Petroleum (Pte) Ltd., will be providing the LNG bunkering services. The LNG bunkering will be conducted at Jurong Port which is able to support LNG bunkering operations.

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SHARING AT THE LNG FORUM

Amidst a global drive by the maritime industry to lower carbon emissions by focusing on natural gas as a cleaner source of energy, Singapore is set to benefit from the growth of the LNG market.

This was the general consensus by industry leaders who spoke at the inaugural Sea Asia LNG Forum organised by Seatrade and the Singapore Maritime Foundation (SMF) held on 24 April 2018.

A panelist at the forum, Mr Chris Ong, CEO of Keppel O&M, said, "Singapore has a strong maritime cluster here to provide a one-stop shop for customers and our yards have a wealth of experience

in LNG projects as a leading repairer of LNG vessels. Besides drydocking LNG vessels, we can carry out FSRU (Floating Storage and Regasification Unit), FLNG (Floating LNG vessel) and engine conversions."

The session featured in-depth discussions on the macro outlook of LNG production and demand, shipping and regasification solutions and downstream markets including the development of small scale LNG and LNG bunkering.

"Today, for projects to materialize, it requires a great deal of factors to fall into place. Companies need to act as industry enablers to connect the relevant players in the value

chain, to help them move into FID (Final Investment Decision)," Mr Chris Ong added.

"Keppel is able to support and stitch up end-to-end solutions in the LNG value chain by working with our customers from the beginning to develop solutions that will allow them to analyse if the economics of the respective gas fields work."

The forum was part of the annual Singapore Maritime Week run by the MPA.



Mr Chris Ong (second from right), CEO of Keppel Offshore & Marine, speaking at a panel on LNG shipping and regasification markets

Cutting through the noise

Grit blasting is a common process for the repair and conversion arm of Keppel Offshore & Marine (Keppel O&M). The process removes impurities from vessel surfaces such as barnacles, rust and paint to give the vessels a new lease of life. It involves the use of abrasive particles, which are accelerated and forcefully directed against the vessel surface to remove contaminants before the vessel takes on a fresh coat of paint.

This grit blasting process is noisy as immense pressure of up to 8 bar, almost eight times the normal atmospheric pressure, is required to rid the vessel surface of impurities. This pressure is relieved through valves and creates noise of up to 125 dB. As a comparison, normal conversation occurs at 60 dB while continuous exposure to sound of more than 85 dB can be dangerous. The current risk mitigation method is for employees operating the grit blasting device to wear ear protection, which protects them from noise-induced deafness.

Determined to improve the process and create a safer working environment for fellow employees, a team was assembled based on experience and capabilities. Led by Mr Maulood Abu, Assistant Section Manager, Keppel Shipyard, the team set out to identify the root cause of the noise and design a solution that could be implemented easily and quickly.



The team behind "The Silencer" received the Platinum Award from Mr Loh Chin Hua (second from right), CEO of Keppel Corporation, at the SIT Project Awards 2017

They hoped to improve the safety and efficiency of the grit blasting process, without causing disruption to operations.

Through internal analysis corroborated with external research, the team determined that the main source of noise from the grit blasting process came from a relief valve fitted on the blasting equipment, and proposed installing a device on the exhaust of the relief valve to muffle the noise.

After several rounds of trial and error, the team came up with The

Silencer, a product that was able to effectively reduce noise by 34% through providing a controlled environment for the discharge of pressure. This reduction in noise boosted workers' confidence during the blasting process and heightened awareness of their surroundings for greater safety.

For its effectiveness in reducing the risk of noise-induced deafness, the team won the Platinum Award at the Safety Innovation Team (SIT) Project Awards and were commended at the Keppel Safety Convention held on 7 November 2017.

Knowledge sharing

Keppel regularly engages different business units as part of its efforts to align and raise performance standards through active sharing of knowledge and skills.

In the past few months, management from Keppel Corporation and Keppel Offshore & Marine (Keppel O&M) visited BrasFELS shipyard to engage employees on pertinent topics such as security, career development, and compliance.

SECURITY VIGILANCE

In April 2018, a team of security representatives from Keppel O&M and Keppel FELS visited BrasFELS to conduct a security audit.

Led by Mr Phillip Mah, General Manager (Security) of Keppel O&M, the team reviewed BrasFELS's security policies and procedures. This included a table top exercise

(TTX) which involved BrasFELS employees and other various stakeholders, simulating and testing the shipyard's responses during an emergency.

The visiting security audit team also met with public safety and security authorities in Angra dos Reis and Rio de Janeiro. During the sharing, local authorities elaborated on the roles and responsibilities of the different safety and security groups in Brazil, while the Keppel O&M team spoke about safety practices in Singapore.

The BrasFELS team was also briefed on Keppel O&M's newly introduced security policy, which aims to promote more effective and sustainable levels of security in Keppel yards around the world.

Mr Mah said, "BrasFELS performed

well in this audit and has shown effective usage of security technology. The participation of external stakeholders is crucial in risk management, and we commend the active involvement of external agencies and customers in joint exercises such as the TTX and emergency simulation exercises."

"We look forward to the shipyard's asset security team continuing its good work, as we continue to work with our overseas yards to ensure that security measures are robust and rigorous."

EMPLOYEE ENGAGEMENT

Keppel O&M is committed to nurturing its workforce through holistic programmes and employee engagement. In March 2018, BrasFELS received Dr Lee Chay Hoon, Director (Organisational Development), Keppel O&M, who took this opportunity to engage graduates of the BrasFELS Trainee Engineer Programme.

During the forum, Dr Lee shared about the challenges and outlook of the offshore and marine industry, as well as the importance of harnessing collective strengths to remain competitive. She also addressed concerns such as career prospects, and encouraged the young engineers to continue delivering good work so that they develop professionally with Keppel.

Ana Carolina Dallarosa, an engineer in the Costs department, felt heartened after the forum.



Public safety and security authorities from Angra dos Reis and Rio de Janeiro met with Keppel O&M and BrasFELS management, including Mr Herman Effendy (sixth from left), President of BrasFELS, and Mr Phillip Mah (third from left), General Manager (Security), Keppel O&M



Dr Lee Chay Hoon (centre in black), Director (Organisational Development), Keppel O&M, together with graduates of the BrasFELS' Trainee Engineer Programme

“The session allowed us to better understand what the company is doing to tide through this difficult time. These engagements are a platform for transparent conversations, and this motivates us to continue performing well at BrasFELS.”

Mr Herman Effendy, President of BrasFELS said, “We must be focused on not just achieving strong results, but also in the manner in which we achieve these results. All managers and leaders must continue to guide their

teams in respecting the laws and regulations of the countries where Keppel operates, as well as the Group’s policies and procedures.”

REINFORCING COMPLIANCE STANDARDS

In March 2018, a team from Keppel Corporation and Keppel O&M consisting Mr Kevin Chng, GM (Group Risk & Compliance), Keppel Corporation, and Mr Nicholas Choo, GM (Compliance), Keppel O&M, visited BrasFELS shipyard.

Meeting with Keppel FELS Brasil and BrasFELS senior management, the team reiterated Keppel Group’s commitment to compliance, and together explored steps to further enhance standards and practices in this area.



Keppel Corporation and Keppel O&M risk and compliance representatives visited BrasFELS to share best practices in the area of compliance

Shaping the future as *OneKeppel*

At the Global Keppelites Forum 2018, Mr Loh Chin Hua, CEO of Keppel Corporation and Chairman, Keppel Offshore & Marine (Keppel O&M), shared on the Keppel Group's key strategic thrusts, and called on Keppelites to heighten collaborative efforts as we realise our common vision and mission as a solutions provider for sustainable urbanisation.



Keppelites reaffirmed their commitment to collaboration and synergy as *OneKeppel*

The fourth annual Group-wide townhall, the Global Keppelites Forum, was held on 1 February 2018. To mark Keppel Corporation's 50th anniversary, this year's Forum was held at Suntec Singapore Convention & Exhibition Centre, and was attended by close to 500 Keppelites from across the Group. The Forum was also broadcast live to close to 2,000 Keppelites gathered in about 70 locations worldwide.

In his address, Mr Loh Chin Hua, CEO of Keppel Corporation, provided an overview of the Group's milestones, strategy, and priorities for 2018. In line with the theme of 'Shaping the Future', Mr Loh shared on how the Group is well-positioned to pursue opportunities in sustainable urbanisation and improve the lives of the communities that the Group operates in.

"In the past 50 years, Keppel has built strong foundations. We worked to be at the forefront of our chosen industries. This year, we have refreshed our mission to unify Keppelites behind a shared purpose, which is to provide solutions for sustainable urbanisation profitably, safely and responsibly. Our work goes beyond making profits, it is really about improving lives and shaping a better future for everyone," Mr Loh said.

PREPARING FOR THE FUTURE

As Keppel Corporation celebrates its 50th anniversary, Mr Loh encouraged Keppelites to reflect on the future direction of the company and develop new engines of growth. With the external environment becoming increasingly complex, Mr Loh highlighted three strategic thrusts for a *FutureKeppel* –

building resilience, staying relevant and adopting a growth mindset.

In addition, as the Group works towards Vision 2020, Mr Loh urged Keppelites to remain guided by our core values and operating principles.

He said, "It is important for all of us to reflect on our eight core values, understand them well and incorporate them in our lives. In 2018, our focus is on risk management, compliance control and safety. To achieve our goals of full compliance and risk awareness, no control failures and zero fatalities, the tone from the top must be strong and all of us must be proactive."

Recognising people as the company's most important asset, Mr Loh also spoke on



Keppel senior management addressed questions from the audience during the Q&A segment

management’s goal of making Keppel a great place to work.

He shared, “We are determined to weed out unnecessary work and focus our energy on developing better solutions for customers, improving efficiency and exploring new profit pools.”

VALUABLE INSIGHTS

During the question and answer (Q&A) segment after the CEO’s address, Keppelites enthusiastically posted questions via live web portal Pigeonhole to a panel comprising Mr Loh, Mr Chan Hon Chew, CFO of Keppel Corporation, and CEOs across Keppel’s business units. *OffshoreMarine* shares some highlights of the 45-minute Q&A segment.

Can the management share more on Keppel O&M’s corruption case in Brazil?

LCH: Integrity is one of Keppel’s core values and we must reflect deeply on how such an incident could have happened. Since the allegations emerged, we have moved quickly and decisively. As Chairman Dr Lee Boon Yang and I have said, the company has zero tolerance for corruption. While we encourage Keppelites to take legitimate business risks, there

are bright lines that we should not cross. With our enhanced compliance programme, all of us must make sure that the good name of Keppel is protected and that we do not engage in illegal acts. I believe that with our strong capabilities, we can win business fairly, legitimately and ethically.

What does the current focus on compliance mean for the Can Do! spirit?

LCH: As we go through this period, people may become more cautious. This is understandable and not necessarily a bad thing. It is good for our people to develop a better understanding of the rules and to make sure that we are compliant. However, compliance is not a reason for inaction. Compliance is not here to stop you from doing business. Instead, it is to ensure that business is being conducted the right way.

CHC: I have always admired Keppel for its entrepreneurial spirit. Even as we strengthen compliance practices, we should continue to retain this virtue, which is unique to Keppel, and think of compliance as a partner which makes sure that we do the right thing as we do well.

Given the downturn in the Offshore & Marine sector, how does Keppel O&M plan to retain its talent?

CO: Keppel O&M remains committed to developing its people. While the market has taken a hit, we have spared no efforts in succession planning and have a strong talent pipeline. We make sure that we share the company’s future plans with our talents and ensure that they are engaged.

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

Chua Chor Teck Memorial Lecture

“What we achieved in the past was only a small part of the big picture. There are many career prospects, space for disruption, and a bright future in the trading and maritime system of Singapore.” This was the key advice given by guest speaker Mr David Chin, then Executive Director of the Singapore Maritime Foundation, at the 32nd Chua Chor Teck Memorial Lecture held on 29 January 2018 at Singapore Polytechnic.

With colourful anecdotes, Mr Chin recounted how Singapore reinvented and developed world-class shipyards, equipment and services. Mr Chin started his maritime journey with Keppel



The 32nd Chua Chor Teck Memorial Lecture was delivered by Mr David Chin (fourth from left) and attended by management from various companies and institutions, including Mr Chris Ong (second from left), CEO of Keppel O&M, and Mr Foo Nan Cho (first from left), President of SNAME

Shipyards (formerly Singapore Harbour Board's Dockyard Department) as an apprentice in 1962, and subsequently rose through the ranks to take up key roles in the Trade Development Board and Ministry of Trade and Industry.

Jointly organised by Keppel

Offshore & Marine, the Society of Naval Architects and Marine Engineers, Singapore (SNAME) and the Singapore Maritime Academy, the annual lecture series is in remembrance of the late Mr Chua Chor Teck, a former MD of Keppel Shipyards and a pioneer of Singapore's marine industry.

Broad-based curriculum

The Keppel Offshore & Marine (Keppel O&M) Technology and Engineering Development (KTED) Programme commenced on 23 April 2018, with 37 Keppelites participating in the third edition of this well-received programme. This year, the cohort consisted of Keppelites from overseas, including

two from BrasFELS and one from Keppel Batangas.

Jointly organised by Keppel O&M and the Singapore University of Technology and Design (SUTD), the KTED programme is designed with a broad-based curriculum so that Keppelites are exposed to a robust

range of business and engineering topics.

One such course explores the success factors in disruptive innovations such as Artificial Intelligence, so that participants are better equipped to identify and create game-changing innovations of their own.



The launch of the KTED programme was attended by management from Keppel O&M, including Mr Chris Ong (sixth from right in front row), CEO of Keppel O&M and Mr Chor How Jat (sixth from left in front row), MD (Conversions & Repairs), Keppel O&M

Mr Chris Ong, CEO of Keppel O&M, reinforced the importance of this programme. At the opening lunch reception, he shared, “Our people will be our next engine of growth as they seek innovative solutions to overcome complex problems and create value for Keppel O&M.”

A Keppelite at heart

"I was born and raised as a Keppelite in the United States," John Bajor, Marketing Manager for Keppel Offshore & Marine (Keppel O&M) USA, shared proudly. His father, John Bajor Snr, had helped to set up Keppel's office on Broadway in New York City in 1975.

The office moved to New Jersey in the 1980s and John, then in high school, would do his homework there in the evenings while his father discussed business in the next room with Mr Chua Chor Teck and Mr Loh Wing Siew, both men instrumental in the founding years of Keppel Shipyard.

John fondly recounted the circumstances that led to his first stint with Keppel back in 1987. Back then, he chalked up a \$600 phone bill talking with a girl (who eventually became his wife) and his father gave him the opportunity to pay off his bill by working for Keppel.

"Mr Lim Boon Seng took me into the crew, and I cut my teeth by painting the handrails of vessels in the Keppel shipyard. In fact till today, I am still working with him. Keppelites have become my family," John recalled fondly.

Having risen up the ranks at Keppel, John now engages vessel operators in the US in an effort to build, maintain, and convert their vessels in Keppel yards worldwide. His years in Keppel have also given John and his father unique opportunities to work and travel together.



In 2001, John and his father attended the christening of TyCom Reliance, a cable laying and repair vessel, held at Keppel Shipyard

"We viewed cables ship launches at midnight from gantry cranes, christened pipelayers, built rigs, drydocked many ships, forged relationships, bridged cultures, and spent an amazing time together!"

BRAVING THE STORM

In August 2017, the Keppel O&M USA team had to withstand the torrential Hurricane Harvey which brought wind speeds in excess of 200 km/h and 44 inches of rain over Houston, causing unprecedented flooding and displacing thousands of people.

In preparation, the Keppel O&M USA Business Continuity Management Committee reviewed the contingency plan, and took necessary measures. All information backups were taken to multiple locations, offices were secured and emergency supplies were distributed. The team had also established an online group to ensure that everyone could be contactable and have their



John painted handrails on the Tibbit's Brook on his first day at work for Keppel

wellbeing tracked during the storm's passing.

"Televisions and radios were broadcasting disaster alerts every few minutes and tornado warnings were sounded. It was really nerve-racking! When the storm passed, everyone came out to help one another. We were so proud to see strangers helping strangers."

Owing to the vigilance and preparedness of Keppel O&M USA, the office was up and running barely a week after the storm. Back home, by a stroke of luck, John's neighbourhood was out of power for only four hours.

A loving father of three children, John enjoys spending his weekends horseback riding with his wife, or playing the guitar with his son.

Stronger together as *OneKeppel*

Screaming crowds. Deafening cheers. These were the sights and sounds that filled the grandstands of Ngee Ann Polytechnic at the Grand Finale of the 2017/2018 Keppel Games held on 15 April 2018.

Keppelites from across the Group, including senior management, exemplified this year's theme of "Stronger Together as *OneKeppel*", as they gamely participated in the run, swim and track events.

Despite the strong fight put up by Teams Caspian and Pacific to wrest back points accumulated by Team Atlantic over the course of the games, Team Atlantic emerged

triumphant with the Overall Challenge Trophy at the Keppel Games with a grand total of 21 gold medals.

ON YOUR MARKS, GET SET, GO!

Kicking off the games at the crack of dawn was the Men's, Women's and Veteran's Open categories of the long distance run.

No distance proved too great for Keppelites, as runners covered distances of 3km in both the Women's and Veteran's Open category, and 6km in the Men's Open category.

Team Pacific displayed their grit, endurance and determination in

out-running Team Atlantic and Team Caspian to successfully win the Gold medals in the Men and Women's open categories, and become the overall winner in the long distance run.

MAKING WAVES

With the competition heating up after the long distance run, it was time to cool down as the teams dove into the cool waters for the swimming championship event.

Team Atlantic proved their strength and prowess in the waters once again, bagging the Gold medals for five out of the six swim events. Team Pacific took home the remaining Gold medal in the 100m Men's Breaststroke event.

After the stellar performance, Team Atlantic was declared the overall winner of the swimming championship.

RACE TO THE FINISH

Keppelites' spirits continued to soar, as Teams Atlantic, Caspian and Pacific limbered up for the final competition of the day – the track events.



All smiles from Team Atlantic, the Overall Challenge Trophy winner at the Keppel Games Grand Finale



Mr Lim Tow Fok, GM, Property Management at Keppel Land and President of Keppelite Recreation Club flagged off runners for the long distance events at the break of dawn



A stellar showing from Team Atlantic saw the swimming crown returned to them for another year running

Medal Tally	Gold	Silver	Bronze	Gold	Silver	Bronze	Gold	Silver	Bronze
	21	21	14	16	12	19	13	18	16
Challenge Trophies / Events Won	Team Atlantic Overall Challenge Badminton International chess Soccer Swimming Tennis Volleyball			Team Caspian Basketball Bowling Dragonboat Golf Sepak takraw			Team Pacific 3km/6km run Flag design Netball Table tennis Track		

CHEERS IN UNISON

The spirit of *OneKeppel* was on full display at the Grand Finale of the Keppel Games. Despite the intense competition, Keppelites displayed keen camaraderie and sportsmanship throughout the Games, be it cheering and helping each other on and off the fields and pools, or wishing the competing teams best of luck.

After months of hard work and training, it was time for the final showdown as contestants raced and sprinted down to the finish line.

The crowd watched with unwavering attention as the runners made swift

baton passes and tried to outrun and overtake each other. Team Pacific eventually emerged victorious and was crowned the champion of the track segment, defeating Teams Atlantic and Caspian with a total of three Gold, two Silver and two Bronze medals.

In his closing speech, Mr Loh Chin Hua, CEO of Keppel Corporation, commended Keppelites for their sterling sportsmanship displayed during the Games, reiterating the importance of staying strong as *OneKeppel*.



Keppelites giving it their all to sprint to the finish line in the track segment

In recognition of their exemplary spirit shown throughout the competition, Team Pacific was awarded the Sportsmanship Award (Team) for the second year running, since the introduction of the award in the last edition of the Keppel Games.



Keppelites embodying the spirit of *OneKeppel* at the Keppel Games Grand Finale

Inspiring youth of the future

As part of its Teach-It-Forward programme, BrasFELS hosted 40 students in the 9th grade of the Tereza Pinheiro de Almeida Municipal School on 23 March 2018.

The students engaged in lively discussions with BrasFELS representatives including Cristina Pinto, Deputy Project Director, as well as Luiz Queiroz, Manager of Quality, Health, Safety and

Environment, to find out more about their professional and personal experiences.

Present at the visit was Felipe Voto, Assistant Coordinator at the Municipal Secretariat of Education, Science and Technology (SECT), who shared, "It was a pleasure to visit the BrasFELS shipyard, and heartening to see the students brimming with interest and curiosity. This visit is the result of a partnership between SECT and BrasFELS, and we hope it can make a positive difference to the future career choices of our students."



During the visit, students of the Tereza Pinheiro de Almeida Municipal School were given the opportunity to tour the yard to a closer look at the ongoing projects

Memorable engagement

Volunteers from Keppel FELS spent a meaningful afternoon with 23 elderly patients at the Yishun Community Hospital on 28 February 2018 as part of their ongoing series of game sessions with the patients.

She also thanked the volunteers for always planning activities with the patients' welfare in mind, noting that maintaining patients' concentration levels has always been a challenge for them at the hospital.

"It's the first time our patients have played such a game, and I'm sure it will benefit our patients in the long run if we continue doing it," she shared.

The latest instalment saw the volunteers introduce a new memory game to help maintain patients' cognitive abilities and increase their concentration levels.

Hospital programme coordinator Ms Linda Ong conveyed encouraging feedback from the patients that they had enjoyed the card and memory games so much that they requested for these to be part of all future events at the hospital.



Volunteers introduced a new memory game to help maintain patients' cognitive abilities and increase their concentration levels

GLOBAL NETWORK

SINGAPORE

KEPPEL OFFSHORE & MARINE LTD

(Head Office)
50 Gul Road, Singapore 629351
Tel: +65 6863 7200 Fax: +65 6261 7719
www.keppelom.com

KEPPEL FELS LTD

(Pioneer Yard 1 – Head Office)
50 Gul Road, Singapore 629351

(Pioneer Yard 2)
55 Gul Road, Singapore 629353

(Crescent Yard)
60 Shipyard Crescent, Singapore 627735
Tel: +65 6863 7200 Fax: +65 6261 7719

www.keppelfels.com
Email: marketing@keppelfels.com
Contact Persons: Chris Ong Leng Yeow, Managing Director
Marlin Khiew, General Manager (Marketing)
Yeong Yew Ming, Assistant General Manager
(Business Development, Offshore)

KEPPEL SHIPYARD LTD

(Tuas Yard – Head Office)
51 Pioneer Sector 1, Singapore 628437
Tel: +65 6861 4141 Fax: +65 6861 7767

(Benoi Yard)
15 Benoi Road, Singapore 629888
Tel: +65 6861 6622 Fax: +65 6861 4393

(Gul Yard)
55 Gul Road, Singapore 629353
Tel: +65 6861 3007 Fax: +65 6862 3645/7

www.keppelshipyard.com
Email: ks@keppelshipyard.com
Contact Persons: Chor How Jat, Managing Director
Chin Sze Kiun, General Manager (Commercial – Repair)
Tey Wee Hong, General Manager (Commercial – Conversions)

KEPPEL SINGMARINE PTE LTD

50 Gul Road Singapore 629351
Tel: +65 6863 7200 Fax: +65 6261 7719
www.keppelsingmarine.com
Email: singmarine@keppelsingmarine.com
Contact Persons: Abu Bakar Bin Mohd Nor, Managing Director
Andrea Gay Lee Bei Si, Assistant General Manager
(Business Development, Gas)
Tan Ser How, Assistant General Manager
(Marketing, Specialised Vessels)

OFFSHORE TECHNOLOGY DEVELOPMENT PTE LTD

55 Gul Road, Singapore 629353
Tel: +65 6863 7409 Fax: +65 6862 3465
Email: enquiry@keppelotd.com
Contact Person: Dr Foo Kok Seng, Executive Director

DEEPWATER TECHNOLOGY GROUP PTE LTD

50 Gul Road, Singapore 629351
Tel: +65 6863 7163 Fax: +65 6863 1739
Email: aziz.merchant@keppelom.com
Contact Person: Aziz Merchant, Executive Director
Email: murthy.pasumarthy@keppelfels.com
Contact Person: Suryanarayana Murthy Pasumarthy,
Assistant General Manager

MARINE TECHNOLOGY DEVELOPMENT PTE LTD

50 Gul Road, Singapore 629351
Tel: +65 6861 6622 Fax: +65 6862 1792
Email: aziz.merchant@keppelfels.com
Contact Person: Aziz Merchant, Executive Director
Email: anis.hussain@kometech.com.sg
Contact Person: Anis Altaf Hussain, General Manager

GAS TECHNOLOGY DEVELOPMENT PTE LTD

51 Pioneer Sector 1 Singapore 628437
Tel: +65 6558 7620 Fax: +65 6558 7621
Email: enquiry@keppelotd.com
Contact Persons: Dr Foo Kok Seng, Executive Director

KEPPEL SEA SCAN PTE LTD

55 Gul Road, Level 5, Singapore 629253
Tel: +65 6803 1300
Email: ahcheng.lim@keppelseasecan.com
Contact Person: Lim Ah Cheng, Executive Director

ASIAN LIFT PTE LTD

23 Gul Road, Singapore 629356
Tel: +65 6668 4222 Fax: +65 6668 4333
Email: asianlift@asianlift.com.sg
Contact Person: John Chua, General Manager

KEPPEL SMIT TOWAGE PTE LTD

23 Gul Road, Singapore 629356
Tel: +65 6668 4222 Fax: +65 6897 8056
Email: kst@keppelsmit.com.sg
Contact Persons: Romi Kaushal, Managing Director
Jerry Wong, General Manager

AUSTRALIA

KEPPEL PRINCE ENGINEERING PTY LTD

Level 2 Riverside Quays, 1 Southbank Boulevard
Southbank, Victoria 3006, Australia
Tel: +613 9982 4589, +614 1999 0788 Fax: +613 9551 0624
Email: cchiam@ozemail.com.au
Contact Person: Charles Chiam, Director

AZERBAIJAN

BAKU SHIPYARD LLC

Garadagh District, Salyan Highway 25th km
Baku AZ 1083, Azerbaijan
Tel: +994 12 446 4944, +994 12 446 4945,
+994 12 446 4946 Fax: +994 12 446 4947
Email: marketing@bakushipyard.com
Contact Persons: Lam Khee Chong, General Manager
Elvin Huseynov, Marketing Manager

BRAZIL

KEPPEL FELS BRASIL S.A.

Rua da Quitanda nº 86, Sala 301, 3º Andar,
CEP - 20091 - 005, Rio de Janeiro, RJ, Brasil
Tel: +55 21 2102 9400 Fax: +55 21 2102 9425
Email: Marlin.Khiew@keppelfels.com
Contact Person: Marlin Khiew, President & CEO

ESTALEIRO BRASFELS LTDA

Av. Conde Mauricio de Nassau,
S/n - Jacuacanga CEP - 23914 - 460 Angra dos Reis, RJ, Brasil
Tel: +55 24 3361 6000 Fax: +55 24 3361 6258
www.kfelsbrasil.com.br
Email: herman.effendy@keppelfels.com
Contact Person: Herman Effendy, President

KEPPEL SINGMARINE BRASIL LTDA

Rua Prefeito Manoel Evaldo Müller
3388 Bairro Volta Grande, Navegantes,
Santa Catarina, Brasil, CEP 88371-860
Tel: +55 47 3405 0160 Fax: +55 47 3405 0170
Email: diwakar.karri@keppelsingmarine.com
Contact Person: Diwakar Karri, General Manager

BULGARIA

KEPPEL FELS BALTECH LTD

54 Debar Street, Varna 9000, Bulgaria
Tel: +359 52 684 250 Fax: +359 52 684 252
Email: office@fels.bg
Contact Person: Lyudmil Stoev, General Manager

CHINA

KEPPEL NANTONG SHIPYARD CO. LTD

KEPPEL NANTONG HEAVY INDUSTRY CO. LTD
No. 9 Yan Jiang Road, Nantong City, Jiangsu Province
P.R. China 226005
Tel: +86 513 8530 0000 Fax: +86 513 8530 0007
Email: edmund.lek@keppelnantong.com
Contact Person: Edmund Lek, President

KEPPEL FELS ENGINEERING SHENZHEN CO. LTD

3rd Floor, Chiwan Petroleum Building
Chiwan Road No. 5, P.R. China 518068
Tel: +86 755 26851902/+86 755 26851959
+65 6863 7215 (Singapore Contact)
Fax: +86 755 26851670
Email: norman.chua@keppelfels.com
Contact Person: Norman Chua, Engineering Manager

KEPPEL FELS ENGINEERING WUHAN CO. LTD

Blk 6 #05, Financial Harbor, No. 77 Optical Valley Ave
Wuhan City Hubei Province, P.R. China 430070
Tel: +86 27 59838598 / +65 6863 7215
E-mail: reynard.xiao@keppelfels.com
Contact Person: Reynard Xiao Peng, General Manager

INDIA

KEPPEL OFFSHORE AND MARINE ENGINEERING SERVICES

MUMBAI PTE LTD

Unit 3, 8th Floor, Prism Tower-A, Mindspace, Link Road
Goregaon (West), Mumbai 400 062, India
Tel: +91 22 40018888 Fax: +91 22 40018898
E-mail: kabeer.syedahamed@kommumbai.com
Contact Person: Syed Ahamed Kabeer, General Manager
Email: joseph.matthew@keppelsingmarine.com
Contact Person: Joseph Matthew, General Manager

Indonesia

PT BINTAN OFFSHORE

Jalan Nusantara KM 23, Kecamatan Bintan, Timur,
Kabupaten Bintan, Kepulauan Riau, Indonesia
Tel: +62 771 462 699 Fax: +62 771 462 575
Email: hauwsheong.loe@keppelfels.com
Contact Person: Loe Hauw Sheong, General Manager

JAPAN

REGENCY STEEL JAPAN LTD

46-59 Nakabaru, Tobata-ku,
Kitakyushu, Fukuoka 804-8505, Japan
Tel: +81 93 861 3103 Fax: +81 93 861 3114
Email: chunyu.wong@r-sj.com
Contact Person: Wong Chun Yu, President

THE NETHERLANDS

KV ENTERPRISES

Prof. Gerbrandyweg 25, 3197 KK Rotterdam-Boilek
Harbour no. 4550, P O Box 1001, 3180 AA Rozenburg,
The Netherlands
Email: egurbanov@kventerprises.nl
Contact Person: Elshan Gurbanov, Director

THE PHILIPPINES

KEPPEL PHILIPPINES MARINE, INC

Unit 3-B Country Space 1 Building, 133 Sen. Gil Puyat Avenue,
Salcedo Village, Barangay Bel-Air, 1200 Makati City, Philippines
Tel: +63 2 892 1816 Fax: +63 2 815 2581
www.keppelphilippinesmarineinc.com
Email: mhq@keppelpm.com or commercial@keppelpm.com
Contact Persons: Chor How Jat, Chairman
Leong Kok Weng, President
Wong Jen Ming, Senior Vice President
Stefan Tong Wai Mun, Executive Vice President

KEPPEL BATANGAS SHIPYARD

Keppel Philippines Marine – Special Economic Zone
Barangay San Miguel, 4201 Bauan, Batangas, Philippines
Tel: +63 43 727 1532 to 36 Fax: +63 43 980 0450
www.keppelphilippinesmarineinc.com or
commercial@keppelpm.com
Email: kbs@keppelpm.com
Contact Persons: Wong Jen Ming, President

KEPPEL SUBIC SHIPYARD, INC

Subic Shipyard – Special Economic Zone
Cabangaan Point, Barangay Cawag,
2209 Subic, Zambales, Philippines
Tel: +63 47 232 2380 or 6347 232 2710
Fax: +63 47 232 3350
Email: all@subicship.com or commercial@subicship.com
Contact Persons: P. Shanmugam, Senior Vice President
Leong Chee Wah, General Manager

QATAR

NAKILAT-KEPPEL OFFSHORE & MARINE LTD

Erhama Bin Jaber Al Jalahma Shipyard
Southern Break Water, Ras Laffan Industrial City (RLIC)
PO. Box 28388, Qatar
Tel: +974 4419 7300 Fax: +974 4419 7301
www.nkom.com.qa
Email: gs.tan@nkom.com.qa
Contact Person: Tan Geok Seng, CEO

UNITED ARAB EMIRATES

KEPPEL LETOURNEAU MIDDLE EAST FZE

Office No: LB16504, Jebel Ali, Dubai, United Arab Emirates
Tel: 971 4886 0010 Fax: 971 4886 0012
E-mail: mohsen.abdelalim@keppelletourneau.com
Contact Person: Mohsen Abdelalim, General Manager
(Operations)

USA

KEPPEL OFFSHORE & MARINE USA, INC

5177 Richmond Ave, Suite 1065, Houston, TX 77056, USA
Tel: +1 713 600 8380 Fax: +1 713 600 8384
Email: simon.lee@keppelamfels.com
Contact Person: Simon Lee, President

KEPPEL AMFELS, LLC

20000 State Highway 48, Brownsville, Texas 78521, USA
Tel: +1 956 831 8220 Fax: +1 956 831 6220
Email: simon.lee@keppelamfels.com
Contact Person: Simon Lee, President

KEPPEL LETOURNEAU USA, INC.

5656 North Sam Houston, Parkway East Houston, Texas 77032
Tel: 1 832 838 5879 Fax: 1 832 787 8800
Email: ron.macinnnes@keppelletourneau.com
Contact Person: Ron MacInnes, President

KEPPEL FLOATEC, LLC

5177 Richmond Ave, Suite 900, Houston, TX 77056, USA
Tel: +1 713 600 8350 Fax: +1 713 600 8384
Email: tk.das@keppelfloatec.com
Contact Person: Tapan K. Das, President

VIETNAM

KEPPEL FELS LTD

PetroVietnam Towers, Suite 410
8 Hoang Dieu Street, Ward 1, Vung Tau City, S.R. Vietnam
Tel: +84 643 850098 Fax: +84 643 850089
Email: kfelsvietnam@keppelfels.com
Contact Person: Wong Xin Yi, Country Manager

Keppel to build mid-water harsh environment rig

Keppel Offshore & Marine's (Keppel O&M) wholly-owned subsidiary, Keppel FELS, announced on 11 March 2018 a contract with Awilco Drilling PLC (Awilco) to construct a mid-water semisubmersible (semi) drilling rig for harsh environment use.

As part of the transaction, Awilco has independent options to order up to another three similar rigs to be exercised within 12, 24 and 36 months respectively. The prices of the three additional rigs are subject to cost adjustments and will only be finalised and announced separately if and when the options are exercised.

Scheduled for completion in 1Q 2021, the rig will be built to Moss Maritime's CS60 ECO MW design. Compared to the ultra-deepwater CS60, this is a compact version specially designed, configured and outfitted for mid-water operations of up to depths of 1,500m.

Mr Chris Ong, CEO of Keppel O&M, said, "We are pleased to partner Awilco once again, having previously delivered three jackup rigs to the same management team. It is a testament of their trust and confidence in Keppel's capabilities and rig-building solutions. We have worked closely with Awilco to customise the CS60 for mid-water and harsh environments. In addition, the use of real time data in the rig's operations and maintenance

will enhance its efficiency and robustness, providing a competitive advantage for harsh environment operations.

"We will also incorporate Keppel O&M's cost-effective engineering and construction solutions in this purpose-built rig. With a strong track record of having delivered 25 semis since 2000, we are confident of delivering this rig to the highest standards to Awilco safely, on time and within budget."

Boasting a low environmental footprint, the drilling rig is designed for operations in harsh environments, including the Norwegian Continental Shelf, UK Continental shelf and Barents Sea. Equipped with a hydraulic hoisting system capable of two million pounds of lifting capacity, it also features an optimised 12 point thruster assisted mooring system for vessel station keeping, complete with hybrid power supply and energy saving features. The rig also incorporates digitalisation, including state-of-the-art condition monitoring systems, which will enhance the drilling efficiency and reliability of the rig, while reducing likelihood of downtime.

Mr Jon Oliver Bryce, CEO of Awilco Drilling PLC, said, "We see growing activity in the harsh environment mid-water rig segment with utilisation increasing, especially in the North Sea. This will be the third semi to join our fleet. With



The Moss Maritime CS60 ECO MW design, customised by Keppel FELS for mid-water and harsh environments, is equipped with state-of-the-art digitalisation which will enhance the drilling efficiency and reliability of the rig

the options to order another three rigs, we are well positioned for the market recovery. This newbuild rig will be purpose-designed with the latest technology, making it cost-effective for our customers.

"The market has a clear preference for high specification rigs from a reliable shipyard like Keppel FELS. We are pleased to partner Keppel again as they are among the world's leading rig builders, and has been able to offer us a value-adding, unique solution."

According to a report in Rigzone, a leading online resource for the oil and gas industry, UK North Sea and Norwegian Continental Shelf are two areas where demand for harsh environment, mid-water semis have picked up considerably since the start of 2017.