

Driving Innovation

Report to Stakeholders 2016

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Driving Innovation

Keppel is a multi-business company committed to providing robust solutions for sustainable urbanisation. At Keppel Offshore & Marine, we are driving innovation by leveraging our extensive industry experience to develop leading-edge solutions that meet the evolving needs of the market. Through working closely with industry partners, we develop new technologies and provide customised solutions for our clients.

Vision

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

Mission

Keppel Offshore & Marine is a global leader in offshore rig design, construction and repair, ship repair and conversion, and specialised shipbuilding. We harness the synergy of 20 yards and offices worldwide to be near our customers and their markets.

Keppel Group's Operating Principles

- 1 Best value propositions to customers.
- 2 Tapping and developing best talents from our global workforce.
- 3 Cultivating a spirit of innovation and enterprise.
- 4 Executing our projects well.
- 5 Being financially disciplined to earn best risk-adjusted returns.
- 6 Clarity of focus and operating within our core competence.
- 7 Being prepared for the future.



View our report online:
www.keppelom.com

Chairman's Statement

We are focused on optimising our operations, strengthening capabilities, seizing opportunities and leveraging innovation and technology to emerge stronger from this downturn and position ourselves for the future.



Loh Chin Hua
Chairman

Dear Stakeholders,

2016 was another challenging year for Keppel Offshore & Marine (Keppel O&M). Apart from an uncertain international environment characterised by slowing global growth and increasingly protectionist sentiments in several developed economies, the offshore and marine sector continued to be severely impacted by volatile and depressed oil prices, which fell to a 13-year low of below US\$30 per barrel at the start of the year. Oil majors responded by cutting back capital expenditure in Exploration and Production (E&P), thus resulting in the lack of new projects coming on-stream. While oil prices have since rebounded to above US\$50 per barrel at the start of 2017 following the decision by OPEC and other oil-producing countries to cut production, we do not expect a quick turnaround for the offshore sector, which continues to suffer from weak utilisation of the existing offshore fleet and a continuing oversupply of rigs and support vessels. In addition, the United States (US) shale oil production has also been rising, offsetting the production cuts by OPEC. We therefore expect and are prepared for the long winter in the offshore and marine sector to remain for some time.

Resilience Through Market Turbulence

Despite the difficult conditions, Keppel O&M achieved a creditable net profit of \$28.5 million in 2016. We made an operating profit of \$412 million, before impairments amounting to \$275 million for fixed assets, stocks & work-in-progress and investments. We secured new contracts worth about \$500 million for non-drilling solutions, including orders for three dredgers, a pipelay vessel upgrade, four Floating Production Storage and Offloading (FPSO) projects and our first two dual-fuel diesel LNG tugs, which will be built to Keppel's award-winning proprietary design. Non-drilling solutions currently make up over half of our \$3.7b orderbook.

Our network of yards executed their projects well, delivering 21 major projects in 2016, including four jackup rigs, an accommodation semisubmersible (semi), one of the world's largest harsh environment land rigs, several FPSO conversion and fabrication jobs, a deepwater derrick pipelay vessel as well as other specialised vessels.

During the year, we took carefully-considered and decisive measures to

rightsized in response to the changing market conditions, not just to weather the downturn but more importantly, to emerge leaner and more competitive in the long run. In 2016, Keppel O&M reduced its direct workforce by about 10,600 or 35%, with about 3,800 in Singapore and 6,800 overseas. In tandem, we rationalised the footprint of our yards worldwide and mothballed two overseas supporting yards. Out of the seven yards in Singapore, we plan to close three supporting yards as we streamline our operations. Our business divisions are also improving processes and reducing costs, including through sharing resources and services. These collective measures have reduced overheads significantly, achieving savings of some \$150 million in 2016.

Our streamlining and rightsizing efforts will continue in 2017. Our yards will remain focused on executing both existing and new contracts well. We expect to deliver some 20 newbuild and conversion projects around the world, including jackup rigs, a drilling semi, an ice-class vessel and several FPSO projects. We are set to grow our track record in LNG solutions with the delivery of Golar Hilli, the world's first Floating Liquefied Natural Gas (FLNG) vessel conversion later this year.

Building Strengths, Leveraging Synergies and Positioning for the Future

In the current uncertain environment, what sets Keppel O&M apart from other industry players are our strong competencies in execution and innovation, our strengths as part of a diversified multi-business group with a strong balance sheet and our financial discipline. Beyond dealing with the immediate challenges, the market downturn is an opportunity for us to entrench our leadership position by delivering our projects well, exploring new markets and opportunities, building new capabilities and investing prudently in research and development.

We continue to widen our solution offerings beyond our hallmark products. The Liquefied Natural Gas (LNG) market has good growth potential, given the global push towards adopting cleaner fuel technology. We have developed technologies that cater to the LNG value chain, ranging from our liquefaction technology, PreNEX, to proprietary designs for offshore and onshore liquefaction plants, LNG carriers, barges and tugs.

We have also made moves into LNG Bunkering through the 50-50 joint venture (JV) with Shell to supply LNG bunkering services in the Singapore port. The JV, FuelNG, has secured its first two contracts from Shell to provide bunkering services for Keppel Smit Towage and Maju Maritime's dual-fuel tugs.

In May 2016, Keppel O&M completed the acquisition of Cameron's offshore product division and commenced operations of Keppel LeTourneau with offices in the US, United Arab Emirates and Singapore. The acquisition will not only broaden Keppel O&M's suite of jackup rig designs but also expand our business in the provision of aftersales and aftermarket services for more than 150 LeTourneau™ rigs in the market.

We remain steadfast in strengthening customer relationships and are purposeful towards making early moves to enter niche markets. In 2016, we entered into a shareholders' agreement with Rosneft Oil Company and MHWirth to set up a Singapore incorporated joint venture company (JVCO). The JVCO will establish a wholly-owned design and engineering Centre (DEC) in the Russia Federation focusing on the design and engineering of mobile offshore drilling units for shallow waters. This lays the foundation for future work from Russian and other international customers in the region. Both the JVCO and the DEC will, in the conduct of their business and activities, adhere to the prevailing US and European Union sanctions imposed on the Russian offshore oil and gas sector.

In non-oil and gas related products, we have seized opportunities in the building of specialised vessels. During the year, we made inroads into the dredger newbuild market when Keppel Singmarine secured a contract to build three dredgers for Jan De Nul.

Our strategically-located yards and offices enable us to keep our ears close to the ground and engage clients and partners to identify opportunities and develop solutions for captive markets. For example, in the US, our Keppel AmFELS yard in Texas is actively looking to build vessels for the Jones Act market, which requires vessels travelling between US ports to be built, owned and flagged in the US.

Leveraging the wide range of capabilities and synergies within the Keppel Group, Keppel O&M is also looking into adapting our proprietary technologies and

Operating Profit of

\$412m

before impairments amounting to \$275 million for fixed assets, stocks & work-in-progress and investments.

New Contracts of

\$500m

for non-drilling solutions, including orders for three dredgers, a pipelay vessel upgrade, four FPSO projects and two dual-fuel diesel LNG tugs.

Chairman's Statement

In the current uncertain environment, what sets Keppel O&M apart from other industry players are our strong competencies in execution and innovation, our strengths as part of a diversified multi-business group with a strong balance sheet, and our financial discipline.

know-how for new applications. We have been adapting our technology developed for the offshore industry for other uses, such as offshore wind support facilities, floating power plants and floating desalination plants, to provide practical solutions to meet the growing needs of sustainable urbanisation.

Reinforcing Sustainable Practices

In Keppel, we believe that strong corporate governance is key to the sustainability of our businesses and performance. As we grow our business in an increasingly complex international operating environment, our compliance and control processes must also be enhanced accordingly to ensure that our people are well equipped to navigate through the intricacies and challenges of various situations across jurisdictions.

With regard to the ongoing investigations in Brazil, following further internal investigations, Keppel recognised that some transactions involving a former agent of certain Keppel entities in Brazil might be suspicious. Keppel has notified and is cooperating and working with the authorities in the relevant jurisdictions towards the resolution of the underlying issues arising from or in connection with the transactions. I would like to assure all stakeholders that Keppel has a zero-tolerance stance against any form

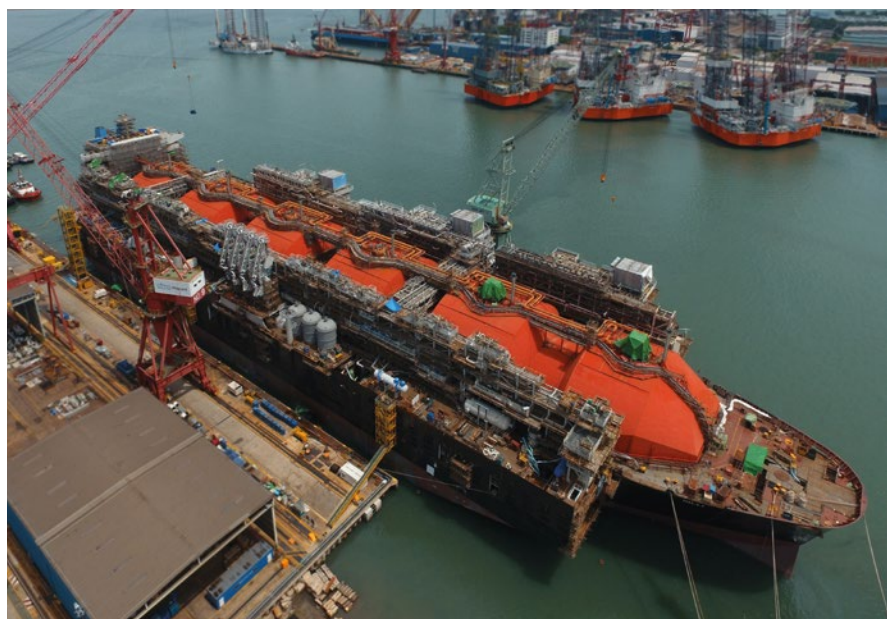
of illegal activity, including bribery and corruption, involving its employees or associates.

On safety, we remain steadfast on continuous improvements regardless of our operational activities. While Keppel O&M achieved a record low accident frequency rate of 0.07 per million man-hours worked, unfortunately, we suffered four fatalities in 2016, despite our best efforts. We are saddened by the loss of lives. Such tragic events underscore the importance of unwavering vigilance in ensuring safety. Each incident was thoroughly investigated, with root causes identified and preventive measures introduced so that similar incidents are not repeated. We continue to strengthen our efforts to ensure that employees and workers will be able to return home safe every day.

Even as we hunker down, people are our core asset and we recognise the importance of training and nurturing our workforce to allow each staff to maximise their potential. In 2016, we invested \$12.4 million in the training of our workforce globally. We actively deploy our talents across business units, providing opportunities to gain exposure, glean new experience and grow in the Group.

Keppel is committed to environmental sustainability. Our productivity measures

Keppel O&M is developing innovations and technologies to stay ahead in the market, including undertaking the world's first floating liquefaction vessel conversion which is due for delivery in mid-2017.



Beyond dealing with the immediate challenges, the market downturn is an opportunity for us to entrench our leadership position by exploring new markets and opportunities, building new capabilities and investing prudently in research and development.

have also contributed to reducing our carbon footprint, as well as water and energy usage. We have set up the Keppel O&M Energy Programme Office to synergise energy saving initiatives across all our shipyards.

We also believe in empowering lives and nurturing communities wherever we operate. In 2016, besides raising money for charitable causes, Keppel O&M staff clocked more than 4,000 hours helping out in the communities around them.

Acknowledgements

On behalf of the Board of Directors, I would like to thank all our valued customers, business associates, classification societies, vendors, suppliers and contractors for their unwavering support. In addition, I would like to acknowledge and express appreciation for the support of all local, state and federal authorities in the host countries where we have operations.

I would like to welcome Mr Kevin Kwok, previously senior partner of Ernst & Young LLP and Head of the firm's Assurance & Advisory Business Services

for Singapore and ASEAN, to the Board. I am confident that the Board will benefit from Mr Kwok's wealth of experience. He takes over from Mr Sit Peng Sang who stepped down on 31 March 2016, after five years of service on the Board.

After 36 years of service, Mr Chow Yew Yuen, former CEO of Keppel O&M, retired with effect from 31 March 2017 while Mr Wong Kok Seng, former Managing Director (Offshore) of Keppel O&M and Managing Director of Keppel FELS, retired on 4 July 2016, after 23 years of service.

As part of our succession planning and leadership renewal, Mr Chris Ong, Managing Director of Keppel FELS, has been concurrently appointed Acting CEO of Keppel O&M with effect from 1 April 2017. Chris is part of the talent pool which we have been nurturing for leadership succession at Keppel O&M, and the Board and I are confident that he will provide effective leadership to Keppel O&M in the next stage of the company's development. We have also formed an Executive Committee (Exco) of the Board, chaired by myself and comprising Mr Lim Chin Leong,

Mr Robert Somerville and Mr Tan Ek Kia to support the Keppel O&M management team as we navigate through this challenging period.

On behalf of the management and the Board, I would like to thank all Keppelites for their valuable contributions and deep commitment to the company. I am confident that working together, as part of the Keppel Group, and with the grit and Can-Do spirit that have come to define what it means to be a Keppelite, we will be able to ride through the rough waters, seize opportunities along the way and emerge leaner, stronger and more competitive than we were before.

Yours sincerely,



Loh Chin Hua
Chairman
5 April 2017



Everest, an ice-class multipurpose vessel, is Keppel Singmarine's 11th ice-class newbuild and is on track for completion in mid-2017.

Interview with Acting CEO

Across our operations, we are restructuring to achieve greater efficiencies, increase synergies between business units and share resources to develop compelling solutions that are economical, well-designed and well-executed for customers across industries.

We must continue to execute our projects well and ensure that we maintain our strong reputation for safety, quality and timeliness. We are also exploring opportunities where we can repurpose and maximise our offshore technology to ensure a wider portfolio of product offerings.

Q What is the outlook for Keppel Offshore & Marine in 2017 and beyond?

A We anticipate that 2017 will continue to be a challenging year for us. While the agreement by OPEC and some non-OPEC countries to cut oil production saw oil price rise to US\$55 at the start of 2017, this has been dampened by production increases from shale oil producers in the United States (US). In the short term, this will create uncertainty in the price of oil, affecting global exploration and production (E&P) spending.

It may take a while for oil companies and fleet operators to significantly increase expenditures in offshore E&P as they focus on capital discipline and improving balance sheets in the current climate. In addition, with low rig utilisation and dayrates, coupled with an oversupply of newbuild rigs, the market will need time to absorb the existing supply before we see new rigs being ordered.



Chris Ong
Acting CEO
Keppel O&M

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

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

Demand for LNG is also expected to increase. Shell's energy outlook forecasts that global LNG demand is expected to increase by 4-5% a year between 2015 and 2030. The International Maritime Organisation's (IMO) confirmation that the global 0.5% cap on the sulphur content of marine fuel will come into force in 2020 will spur widespread adoption of LNG as a marine fuel. As the reach and applications of small-scale LNG continue to expand, it will increase demand in niche and remote areas.

Notwithstanding the current market conditions, we believe that projects

that are well-designed, fit-for-purpose and economical will be in demand. To this end, we are also exploring opportunities where we can repurpose and maximise our offshore technology to provide unique solutions in non-drilling markets.

Q **How is this down cycle different from the past? What are you doing to tide through this period and prepare for the turnaround?**

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

It means that the offshore oil and gas industry needs to focus on achieving greater efficiencies in cost control and sustainability to be competitive with shale. There will have to be an equilibrium between shale and conventional production for a sustainable supply of oil.

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

the future. There is a lot of flexibility in the levers we can use, whether it is contract workers, equipment, utilisation of yards and offices, among others. For instance, we have redeployed our workforce according to where they are needed most, such as in marine operations for repair work.

In the absence of newbuild rig orders, we are maximising the capacity in our yards with a variety of other projects such as repair, modification and upgrading work as well as the stacking of rigs. Last year, Keppel FELS completed 18 repair and upgrading projects worth more than \$100 million while Keppel Shipyard repaired over 400 vessels.

Even as we rightsize, we have been conscious to retain our core capabilities and personnel to be ready for the upturn. We are maintaining our strategic network of yards with the capacity and capabilities to service our customers in a cost-effective manner wherever they are. We are able to ramp up capacity when the market rebounds and our yards are being restructured to be more efficient through mechanisation and automation to improve work processes, optimise production and reduce reliance on manual labour.



Despite challenging market conditions, Keppel continues to perform creditably, by focusing on executing its projects well, such as Armada Olombendo and Karapan Armada Sterling III, both of which were delivered to the satisfaction of long-standing client, Bumi Armada.

Interview with Acting CEO

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

Q **Having just taken over the helm, what is your immediate priority?**

A My first priority is to ensure that we continue to execute our projects well and ensure that we maintain our strong reputation for safety, quality and timeliness. As I mentioned earlier, we are in the midst of a restructuring that will make us fitter and more nimble while having a wider portfolio of product offerings.

Our ongoing deal with Borr Drilling is a strong statement to the market that there are opportunities in the current market for win-win solutions. It is also a testament to the strong demand for Keppel's proprietary KFELS Super B Class rigs, even in the present challenging market conditions.

Our people are also our key assets and we are taking this time to upskill, train and develop them across a variety of functions.

We are investing prudently and building new capabilities. With Keppel LeTourneau, we have not only expanded our suite of jackup

rig designs, but also expanded our aftersales and aftermarket services. Our joint venture company with Rosneft and MHWirth to set up a design and engineering Centre in Russia, focusing on the design and engineering of mobile offshore drilling units for shallow waters, and adhering to the prevailing US and European Union sanctions on the Russian offshore oil and gas sector, will enable us to support Russian and other international customers in the region.

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

To seize opportunities in the floating production market, we have grown our expertise in this area, from floating production storage and

offloading vessels (FPSO) to floating production semisubmersibles and tension leg wellhead platforms.

Q **What are your long-term strategies to build a more robust future for the company?**

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

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

Keppel FELS maximised the capacity of its yards with a variety of projects besides newbuilding, such as repair, modification and upgrading work. It completed 18 repair and upgrading projects worth more than \$100 million in 2016.



Our R&D units have developed innovations such as liquefaction technology and small-scale LNG carriers. To further bolster our efforts in the LNG-related business, we signed an MOU with Shell to jointly explore potential opportunities to cater to the demand for LNG as a fuel in coastal areas, inland waterways and the international marine sectors. Through our extensive gas strategy, we are well-positioned to be an industry forerunner.

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

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

We are also looking at repurposing our technologies for other markets such as offshore power, offshore desalination and offshore wind. Offshore desalination and power plants can meet the need for power and water in land scarce and remote

areas. Keppel FELS recently worked with Keppel Infrastructure to develop a floating desalination plant that is quicker and cheaper to implement than land-based plants.

Our offerings in the offshore wind market include installation vessels, foundations and transformer platforms. Another product we have developed is the versatile Keppel Self-Installing Platform which is a multi-functional fixed platform design that provides offshore real estate.

Besides product offerings, we are embarking on collaborations to offer new services and to develop more efficient production methods. For instance, we are providing sensing technology, rig analytics, drone inspection services and enhanced 24/7 monitoring solutions as part of the offerings to fleet owners. Through the use of additive manufacturing, especially 3D printing, we are exploring improvements to the way we can build, repair or even service rigs and vessels at sea which require uniquely shaped parts urgently.

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



Keppel O&M delivered six FPSO projects in 2016, including the FPSO Cidade de Caraguatatuba MV27 delivered by BrasFELS in Brazil.

Financial Performance

2016 was another challenging year for the industry. Falling utilisation of existing rigs coupled with a supply overhang of newbuilds caused strong headwinds for the offshore business. Workload was lower due to the lack of new orders and the rescheduling of deliveries. As a result, revenue decreased by 54% to \$2.9 billion. Operating profit of \$412.2 million was 32% below that of 2015 due to lower revenue. Higher working capital

requirements due mainly to rescheduling of rig deliveries resulted in net interest expense of \$92.6 million compared to net interest income of \$29.7 million in 2015. Contribution from associates of \$47.4 million was 34% lower. Profit after tax of \$326.1 million was 38% lower compared to 2015. Net profit of \$28.5 million was 94% lower after impairments of yards, vessels, investments and associates.

The Group's return on equity (before non-recurring items) was 14%, while Economic Value Added was \$(59.3) million.

The Group delivered 21 major projects in 2016. The total value of contracts secured for the year was about \$0.5 billion and the Group ended the year with a net orderbook (excluding the Sete Brasil semisubmersibles) of \$3.7 billion.

Key Figures for 2016

Net Orderbook	\$3.7b	Strong Net Orderbook at end-2016, of which non-drilling solutions made up more than half.
Major Projects Delivered	21	The number of newbuilds, conversions, major repairs / upgrades that Keppel O&M delivered in 2016.
New Orders Secured	\$500m	Creditable level of new contracts for the year.
Reduction in Overheads	\$150m	Savings achieved year-on-year through rightsizing and streamlining operations.
Accident Frequency Rate	0.07	Accident frequency rate achieved in 2016 was an improvement from 0.10 in 2015.
Training Investment	\$12.4m	The amount spent on training employees worldwide during the year.

Group Financial Highlights

Consolidated Profit & Loss Account

for the financial year ended 31 December 2016

	2016 S\$'000	2015 S\$'000	Change %
Revenue	2,853,914	6,241,348	-54
Operating profit	412,228	607,881	-32
Net Interest / investment income / (expense)	(92,598)	29,698	N.A.
Share of results of associates	47,384	72,013	-34
Profit before tax	367,014	709,592	-48
Taxation	(40,911)	(181,986)	-78
Profit after tax	326,103	527,606	-38
Non-Controlling interests	(22,864)	(36,021)	-37
Profit before non-recurring items	303,239	491,585	-38
Non-Recurring items	(274,749)	(11,097)	N.A.
Net profit	28,490	480,488	-94
Economic Value Added (Before non-recurring items)	(59,328)	186,708	-132

Consolidated Balance Sheet
as at 31 December 2016

	2016 S\$'000	2015 S\$'000
ASSETS		
Current Assets		
Cash and cash equivalents	784,359	1,093,151
Trade debtors	1,865,007	1,620,640
Other debtors, deposits and prepayments	329,171	301,707
Stocks & Work-in-progress (Costs>Billings)	4,196,242	3,936,264
Amounts due from related companies	280,302	334,704
Other assets	80,631	84,222
Derivative assets	26,358	21,677
Total Current Assets	7,562,070	7,392,365
Non-current Assets		
Other debtors, deposits and prepayments	113,188	121,871
Amounts due from related companies	308,791	26,072
Other assets	122,174	171,469
Derivative assets	49,228	61,524
Property, plant and equipment	1,521,199	1,711,499
Subsidiaries	-	-
Associated companies	587,365	568,115
Intangible assets	78,893	36,392
Deferred taxation	36,057	19,528
Total non-current assets	2,816,895	2,716,470
Total Assets	10,378,965	10,108,835
LIABILITIES AND EQUITY		
Current Liabilities		
Trade creditors	394,932	315,357
Provision for warranty	72,747	73,909
Accrued expenses	935,293	1,485,629
Work-in-progress (Billings>Costs)	1,574,748	1,751,319
Amounts due to related companies	1,722,432	2,747,960
Derivative liabilities	336,761	301,522
Term loans	100,625	116,704
Provision for taxation	93,922	143,448
Total Current Liabilities	5,231,460	6,935,848
Non-current Liabilities		
Term loans	177,167	146,809
Amounts due to related companies	2,602,581	1,010,000
Deferred taxation	69,020	82,360
Deferred liabilities	1,270	1,287
Derivative liabilities	63,865	212,020
Accrued expenses	31,797	52,276
Total Non-current Liabilities	2,945,700	1,504,752
Capital and Reserves		
Share capital	339,716	339,716
Capital reserves	(449,530)	(558,632)
Foreign exchange translation reserve	(235,791)	(310,804)
Retained earnings	2,388,260	2,009,770
Equity Attributable To Equity Holders of the Company	2,042,655	1,480,050
Non-controlling interests	159,150	188,185
Total Equity	2,201,805	1,668,235
Total liabilities and equity	10,378,965	10,108,835

Group at a Glance

Headquartered in Singapore, we integrate and harness the experience and expertise of 20 yards and offices worldwide to be near our customers and markets.

Keppel Offshore & Marine

Global leader in offshore rig design, construction and repair, ship repair and conversion, and specialised shipbuilding.

Headquartered in Singapore, Keppel O&M integrates and harnesses the experience and expertise of 20 yards and offices worldwide to optimise deployment of resources and effectively execute our *Near Market, Near Customer* strategy.

The head office serves two central functions, providing Operational Services including technology, design and development, engineering and procurement, as well as Corporate Services covering finance, legal, human resources, information services and corporate development.

Driven by innovation and a capable people with the *Can Do!* spirit, we strive to become a builder of distinction in every aspect of our business.



Global Focus For 2016/2017

Fortify Core Competencies

Continued focus on execution excellence, resource optimisation, corporate governance and risk management.

Leverage Growth Platforms

Invest prudently in R&D and new capabilities to explore new markets and leverage proprietary technology for non-oil and gas segments while strengthening market position for long-term growth.

Harness Global Synergies

Leverage core competencies and synergies across the Keppel Group to build up new strengths and expand solution offerings.

Increase Business Robustness

Seize opportunities to strategically acquire or co-invest with partners in new capabilities and facilities, while ensuring proper risk management and compliance.



Offshore

Leading designer, builder and repairer of high-performance mobile offshore rigs.

The Offshore Division, helmed by Keppel FELS, is a leading designer, builder and repairer of high-performance mobile offshore rigs.

The Division's portfolio of proprietary designs and floating production solutions meets a broad spectrum of operating requirements including deep waters and harsh environments.

With technology innovation and competent design and engineering capabilities, this Division offers viable, cost-effective and highly adaptable solutions for newbuilds and upgraded offshore units.



➤ For more details on Offshore, go to: pages 29–30

Marine Ship Repair and Conversion

Trusted industry name for the repair, conversion and upgrade of a diverse range of vessels.

In the Marine Division, Keppel Shipyard is the trusted industry name for the repair, conversion and upgrade of a diverse range of vessels.

Keppel Shipyard is a leader in the conversion of Floating Production Storage and Offloading, Floating Storage and Offloading, Floating Storage Re-gasification, and Floating Liquefaction units. Its competencies include topside and turret fabrication.

With a strong commitment to Health, Safety and Environment and an established reputation of reliability, flexibility and quality for complex projects with quick turnaround, the Division continues to deliver high value to its customers.



➤ For more details on Marine, go to: page 30

Marine Specialised Shipbuilding

Designer and builder of a wide spectrum of highly specialised ships for a global clientele.

The Specialised Shipbuilding arm in the Marine Division is led by Keppel Singmarine, which has a track record of some 400 newbuild vessels of diverse functions and sophistication.

Its portfolio of customised vessels spans Anchor Handling Tug/Supply vessels, multi-purpose Offshore Support Vessels and tugboats to highly advanced solutions such as ice-capable and subsea construction vessels.

Harnessing its suite of design and engineering solutions, strong logistics and infrastructure support in Singapore, Keppel Singmarine provides customers with one-stop value-added services.



➤ For more details on Marine, go to: pages 30–32

Board of Directors



Loh Chin Hua age 55
**Chairman and
 Executive Director**

Date of first appointment as a director:
 14 October 2010

Board Committee(s) served on:
 Board Safety Committee (Member)

Academic & Professional Qualification(s):
 Bachelor in Property Administration,
 Auckland University
 Presidential Key Executive MBA,
 Pepperdine University
 CFA® charterholder

Present Directorships (as at 1 January 2017):
 Chairman, Keppel Offshore & Marine Ltd
 Chairman, Keppel FELS Limited
 Chairman, Keppel Shipyard Limited
 Chairman, Keppel Offshore & Marine Technology
 Centre Pte Ltd
 Chairman, Keppel Land Limited
 Chairman, Keppel Capital Holdings Pte Ltd
 Chairman, Keppel Infrastructure Holdings Pte Ltd
 Chairman, Keppel Telecommunications &
 Transportation Ltd
 Chairman, Alpha Investment Partners Limited

Major Appointments (other than directorships):
 CEO, Keppel Corporation Limited
 Member of National University of Singapore –
 Board of Trustees
 Council Member of Singapore Business
 Federation
 Board Member of Singapore Economic
 Development Board

**Past directorships held over the preceding
 5 years (from 1 January 2012 to
 31 December 2016):**
 Director, Alpha REITS Manager Ltd
 Director, Fels SES International Pte Ltd
 Director, KrisEnergy Limited
 Director, Keppel REIT Management Ltd
 Director, Keppel Land China Limited

Others:
 Nil



Chow Yew Yuen age 62
Director and CEO
 (Retired w.e.f. 31 March 2017)

Date of first appointment as a director:
 22 August 2011

Board Committee(s) served on:
 Board Safety Committee (Member)

Academic & Professional Qualification(s):
 Bachelor of Science in Mechanical Engineering
 (First Class Honours), University of Newcastle
 Upon Tyne
 Attended Advanced Management Programme at
 Harvard Business School

Present Directorships (as at 1 January 2017):
 Chairman, Keppel FELS Brasil S.A.
 Chairman, Keppel Singmarine Pte Ltd
 Chairman, Keppel Philippines Holdings Inc
 Chairman, Keppel Sea Scan Pte Ltd
 Chairman, Deepwater Technology Group Pte Ltd
 Chairman, Marine Technology Development
 Pte Ltd
 Chairman, Offshore Technology Development
 Pte Ltd

Major Appointments (other than directorships):
 Nil

**Past directorships held over the preceding
 5 years (from 1 January 2012 to
 31 December 2016):**
 Nil

Others:
 Former President of Association of Singapore
 Marine Industries (ASMI)
 Former Chairman of National Work At Heights
 Safety Taskforce
 Former Member of Workplace Safety &
 Health Council
 Member of Singapore Accreditation Council
 Member and Director of Singapore Maritime
 Foundation
 Member of ABS Offshore Technical Committee
 and ABS Southeast Asia Regional Committee
 Member of DNV GL South East Asia & Pacific
 Committee



Stephen Pan Yue Kuo age 72
Non-Executive and Independent Director

Date of first appointment as a director:
 19 June 2002

Board Committee(s) served on:
 Audit & Risk Committee (Member)

Academic & Professional Qualification(s):
 Bachelor of Engineering, Youngstown University
 Master of Science (Engineering), Carnegie-Mellon University
 Master of Business Administration, University of Washington

Present Directorships (as at 1 January 2017):
 World-Wide Shipping Agency Limited, Hong Kong (Chairman)
 Eastern Asia Navigation Company Limited

Major Appointments (other than directorships):
 Member of the Supervisory Board of SUSPA GmbH

Past directorships held over the preceding 5 years (from 1 January 2012 to 31 December 2016):
 Chairman and Director of Gard P & I (Bermuda) Ltd

Others:
 Nil



Prof Minoo Homi Patel age 67
Non-Executive and Independent Director

Date of first appointment as a director:
 19 June 2002

Board Committee(s) served on:
 Nil

Academic & Professional Qualification(s):
 Fellow of the Royal Academy of Engineering, the Institution of Mechanical Engineers and the Royal Institution of Naval Architects
 BSc (Eng) First Class Honours and PhD, University of London
 Chartered Engineer
 Honorary Member of the Royal Corps of Naval Constructors

Present Directorships (as at 1 January 2017):
 BPP Technical Services Ltd
 BPP Cables Ltd
 BMT Group Ltd
 BPP Technical Services (Asia) Private Ltd
 Specialist Piggings Services Ltd
 Specialist Gas Separation Ltd

Major Appointments (other than directorships):
 Professor Emeritus, Cranfield University

Past directorships held over the preceding 5 years (from 1 January 2012 to 31 December 2016):
 Professor Mechanical Engineering and Director of Development in School of Engineering, Cranfield University
 Non-Executive Director of Cranfield Aerospace Ltd

Others:
 Nil



Dr Malcolm Sharples age 71
Non-Executive and Independent Director

Date of first appointment as a director:
 19 June 2002

Board Committee(s) served on:
 Board Safety Committee (Member)

Academic & Professional Qualification(s):
 BEng (Engineering Science), University of Western Ontario
 PhD at University of Cambridge
 Fellow of the Society of Naval Architects and Marine Engineers
 Athlone Fellow
 Registered as a Professional Engineer
 Blakely Smith Medal Society of Naval Architects

Present Directorships (as at 1 January 2017):
 Director of Keppel AmFELS, LLC
 Director of Offshore Inspection Services, Inc

Major Appointments (other than directorships):
 President of Offshore Risk & Technology Consulting Inc, USA
 Member of Technology Advisory Panel at Keppel Corporation Limited

Past directorships held over the preceding 5 years (from 1 January 2012 to 31 December 2016):
 Director of Offshore Energy Center

Others:
 Former Vice President of American Bureau of Shipping
 Former President of Noble Denton

Board of Directors



Tan Ek Kia age 68
Non-Executive and Independent Director

Date of first appointment as a director:
 20 May 2009

Board Committee(s) served on:
 Audit & Risk Committee (Member)
 Board Safety Committee (Member)

Academic & Professional Qualification(s):
 BSc Mechanical Engineering (First Class Hons), Nottingham University, United Kingdom
 Management Development Programme, International Institute for Management Development, Lausanne, Switzerland
 Fellow of the Institute of Engineers, Malaysia
 Chartered Engineer of Engineering Council, United Kingdom
 Member of Institute of Mechanical Engineer, United Kingdom

Present Directorships (as at 1 January 2017):
 Star Energy Group Holdings Pte Ltd (Chairman)
 Keppel Corporation Limited
 KrisEnergy Ltd (Chairman)
 PT Chandra Asri Petrochemical Tbk
 Transocean Ltd
 SMRT Corporation Ltd
 SMRT Trains Ltd
 Singapore LNG Corporation Ltd
 Dialog Systems (Asia) Pte Ltd

Major Appointments (other than directorships):
 Nil

Past directorships held over the preceding 5 years (from 1 January 2012 to 31 December 2016):
 City Spring Infrastructure Management Pte Ltd
 City Gas Pte Ltd

Others:
 Former Vice President of APME Ventures and Development, Shell Chemicals
 Former Chairman of North East Asia, Beijing, Shell Companies
 Former Managing Director of Shell Malaysia Exploration and Production



Po'ad Bin Shaik Abu Bakar Mattar age 69
Non-Executive and Independent Director

Date of first appointment as a director:
 20 May 2009

Board Committee(s) served on:
 Audit & Risk Committee (Chairman)

Academic & Professional Qualification(s):
 Bachelor of Accountancy, University of Singapore
 Master in Management, Asian Institute of Management (Makati, Philippines)
 Member of the Institute of Singapore Chartered Accountants

Present Directorships (as at 1 January 2017):
 Hong Leong Finance Limited
 NIE International Pte Ltd
 Rahmatan Lil Alamin Foundation Ltd (Chairman of the Board of Trustees)

Major Appointments (other than directorships):
 Member of the Public Service Commission
 Member of the Council of Presidential Advisors
 Pro-Chancellor of NUS

Past directorships held over the preceding 5 years (from 1 January 2012 to 31 December 2016):
 Director of Tiger Airways Holdings Limited

Others:
 Former Senior Partner of Deloitte & Touche
 Former Member of the Global Board of Directors of Deloitte Touche Tohmatsu



Lim Chin Leong age 62
Non-Executive and Independent Director

Date of first appointment as a director:
 13 September 2010

Board Committee(s) served on:
 Board Safety Committee (Chairman)

Academic & Professional Qualification(s):
 Bachelor's Degree in Electrical Engineering, University of Singapore

Present Directorships (as at 1 January 2017):
 Keppel Telecommunications & Transportation Ltd
 Executive Director at iRock Technologies Co. Ltd

Major Appointments (other than directorships):
 Nil

Past directorships held over the preceding 5 years (from 1 January 2012 to 31 December 2016):
 Independent Non-Executive Director of Imagi International Holdings Ltd

Others:
 Former Chairman of Asia Schlumberger
 Former Business Advisor to Imerys



Robert D. Somerville age 73
Non-Executive and Independent Director

Date of first appointment as a director:
 1 May 2013

Board Committee(s) served on:
 Board Safety Committee (Member)

Academic & Professional Qualification(s):
 Honorary Doctorate of Science, The City University, London
 Honorary Doctorate of Commercial Science, Webb Institute, New York
 Honorary Doctorate of Science, Maine Maritime Academy
 Program for Management Development, Harvard Business School
 Bachelor of Science, Marine Engineering, Maine Maritime Academy

Present Directorships (as at 1 January 2017):
 Nil

Major Appointments (other than directorships):
 Maine Maritime Academy Board of Trustees (Chairman)

Past directorships held over the preceding 5 years (from 1 January 2012 to 31 December 2016):
 GasLog Ltd
 Knightsbridge Shipping Limited
 Golden Ocean Group Limited

Others:
 Former Chairman and CEO of American Bureau of Shipping Inc
 Former Chairman of the International Association of Classification Societies (2005-2006)



Chan Hon Chew age 51
Non-Executive and Non-Independent Director

Date of first appointment as a director:
 3 March 2014

Board Committee(s) served on:
 Audit & Risk Committee (Member)

Academic & Professional Qualification(s):
 Bachelor of Accountancy (Honours)
 Chartered Accountant, Institute of Chartered Accountants, Australia
 Chartered Financial Analyst, CFA Institute
 Chartered Accountant, Institute of Singapore Chartered Accountants

Present Directorships (as at 1 January 2017):
 Chairman, Keppel DC REIT Management Pte Ltd
 Director, Keppel Land Limited
 Director, Keppel Telecommunications & Transportation Ltd
 Director, Keppel Infrastructure Holdings Pte Ltd
 Director, KrisEnergy Ltd
 Director, Keppel Capital Holdings Pte Ltd

Major Appointments (other than directorships):
 CFO, Keppel Corporation Limited
 Member, Accounting Standards Council ("ASC")
 Council Member, Institute of Singapore Chartered Accountants ("ISCA")

Past directorships held over the preceding 5 years (from 1 January 2012 to 31 December 2016):
 Former SVP, Singapore Airlines Limited
 Tiger Airways Holdings Limited
 Singapore Aviation & General Insurance Company (Pte) Ltd
 RCMS Properties Private Limited

Others:
 Former Member of Singapore Accountancy Commission Board
 Former Assistant General Manager (Finance and Corporate Services) of Wing Tai Holdings Limited



Kevin Kwok Khien age 61
Non-Executive and Independent Director

Date of first appointment as a director:
 1 May 2016

Board Committee(s) served on:
 Audit & Risk Committee (Member)

Academic & Professional Qualification(s):
 Bachelor of Arts degree, University of Sheffield (UK)
 Fellow of the Institute of Singapore Chartered Accountants
 Member of the Institute of Chartered Accountants in England & Wales
 Chartered Accountant of the Malaysian Institute of Accountants
 Fellow of the Chartered Malaysian Institute of Taxation
 Fellow of the Singapore Institute of Directors

Present Directorships (as at 1 January 2017):
 Singapore Exchange Ltd
 Mapletree Greater China Commercial Trust Management Ltd
 Wheelock Properties (Singapore) Ltd

Major Appointments (other than directorships):
 Chairman, Accounting Standards Council of Singapore

Past directorships held over the preceding 5 years (from 1 January 2012 to 31 December 2016):
 Singapore Institute of Directors
 NTUC Income Insurance Co-operative Ltd
 Senior Partner Ernst & Young LLP
 Ernst & Young Corporate Finance Pte Ltd
 NTUC Eldercare Co-operative Ltd

Others:
 Advisor – Centre for Seniors

Key Personnel



Keppel Offshore & Marine

- 1. Wong Ngiam Jih**
Chief Financial Officer
(Retired w.e.f. 31 March 2017)
- 2. Chris Ong Leng Yeow**
Acting Chief Executive Officer
(w.e.f. 1 April 2017)
Managing Director
Keppel FELS
- 3. Chow Yew Yuen**
Chief Executive Officer
(Retired w.e.f. 31 March 2017)
- 4. Loh Chin Hua**
Chairman
- 5. Michael Chia Hock Chye**
Managing Director
Marine and Technology
KOMtech
- 6. Chor How Jat**
Managing Director
Keppel Shipyard
- 7. Abu Bakar Bin Mohd Nor**
Managing Director
Keppel Singmarine
- 8. Paul Tan**
Chief Financial Officer
(w.e.f. 1 April 2017)
(Not in photo)



- | | |
|--|--|
| <p>1. Tan Geok Seng
 General Manager
 Special Projects</p> | <p>6. Jeffery Shiu Chow
 Director
 Legal</p> |
| <p>2. Kenneth Chong Yun Kien
 General Manager
 Legal, Company Secretary</p> | <p>7. Edmund Mah Soot Khiang
 General Manager
 Finance</p> |
| <p>3. Dr Lee Chay Hoon
 Director
 Organisation Development and Human Resources</p> | <p>8. Tommy Sam Yuen Sing
 Chief Financial Officer
 Americas</p> |
| <p>4. Lai Ching Chuan
 Director
 Corporate Development</p> | <p>9. Phillip Mah Mun Kuen
 General Manager
 Security</p> |
| <p>5. Yong Chee Min
 Director
 HSE and Special Projects</p> | <p>10. Ang Ting Yang
 General Manager
 Corporate Development</p> |

Key Personnel



Keppel FELS

- 1. Jay Singham**
General Manager
Commercial
- 2. Keith Teo Tiong Gee**
General Manager
Marketing
- 3. Wong Fook Seng**
Executive Director
Quality System and Process Excellence
- 4. Mohamed Sahlan Bin Salleh**
Executive Director
Operations
- 5. Chris Ong Leng Yeow**
Managing Director
- 6. Jerald Lee Quan Ti**
Financial Controller
- 7. Tan Leong Peng**
General Manager
Engineering
- 8. Max Goh Han Bin**
General Manager
Operations



Keppel Shipyard

1. **Ivan Lim Shaw Chuan**
General Manager
Operations
2. **S. Jayakumar**
General Manager
Projects
3. **Louis Chow Wai Laye**
Executive Director
Commercial
4. **Jim Lim Jit Pok**
Financial Controller
5. **Chin Sze Kiun**
General Manager
Commercial – Repair
6. **Michael Chia Hock Chye**
Managing Director
Marine (Keppel O&M)
7. **Chor How Jat**
Managing Director
8. **Albert Kee Heok Seng**
Executive Director
Operations
9. **Burt Loh Kok Mun**
General Manager
Operations
10. **Boo Chin Tuan**
General Manager
Operations Excellence
11. **Chandru Sirumal Rajwani**
General Manager
Special Projects
12. **Leong Kok Weng**
General Manager
Engineering

Key Personnel



Keppel Singmarine

- 1. Tan Ser How**
Assistant General Manager
Commercial
- 2. Mohd Norhelmy Bin Ja'afar**
Assistant General Manager
Human Resources and Organisation Development
- 3. Poon Tai Lum**
General Manager
Commercial and Marketing
- 4. Lee Yoong Hoong**
Assistant General Manager
Operations
- 5. Edmund Lek Hwee Chong**
Executive Director
Operations
- 6. Abu Bakar Bin Mohd Nor**
Managing Director
- 7. Tan Choon Sze**
Financial Controller
- 8. Loh Kee Huat**
Assistant General Manager
Projects
- 9. Au Yeong Kin Ho**
General Manager
Engineering
- 10. Cong Yu Jie**
Assistant General Manager
Engineering
- 11. Li Gang**
Assistant General Manager
Marketing



Research & Development

1. **Dr Matthew Quah Chin Kau**
General Manager, Design
 Offshore Technology Development
Senior Programme Manager
 Offshore Structures and Analysis, KOMtech
2. **Lim Ah Cheng**
General Manager
 Offshore Technology Development
3. **Dr Foo Kok Seng**
Executive Director
 Offshore Technology Development
 Shallow Water Technology, KOMtech
4. **Michael Chia Hock Chye**
Managing Director
 Technology (Keppel O&M)
 KOMtech
5. **Aziz Amirali Hasham Merchant**
Executive Director
 KOMtech
 Deepwater Technology Group
 Marine Technology Development
6. **Charles Sim Paik Huat**
General Manager
 Gas Technology Development
Technical and Projects Director
 Gas Technology and Offshore
 Production, KOMtech
7. **Anis Altaf Hussain**
General Manager
 Marine Technology Development
Programme Director
 Deepwater Technology, KOMtech

Key Personnel

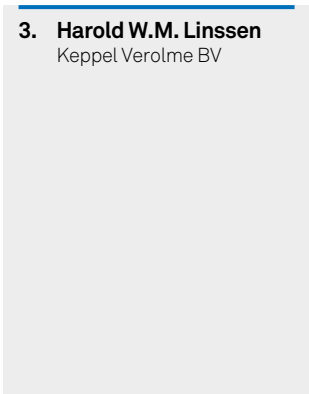
Overseas Heads



1. Kwok Kai Choong
Keppel FELS Brasil S.A.



2. Marlin Khiew Huey Kang
Estaleiro BrasFELS Ltda



3. Harold W.M. Linssen
Keppel Verolme BV



4. David Loh Tah Huay
Nakilat-Keppel Offshore & Marine Ltd



5. Ezra Chiam Soon Lin
Keppel Subic Shipyard, Inc



6. Wong Jen Ming
Keppel Batangas Shipyard, Inc

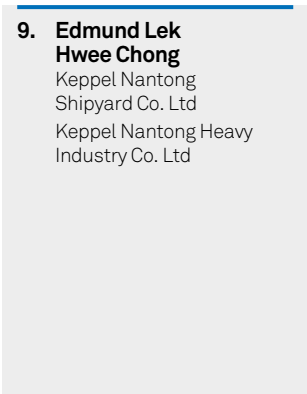




7. Lau Kuat Pin
Caspian Shipyard
Company, LLC



8. Simon Lee Kim Foong
Keppel AmFELS, LLC



**9. Edmund Lek
Hwee Chong**
Keppel Nantong
Shipyards Co. Ltd
Keppel Nantong Heavy
Industry Co. Ltd



10. Michael Holcomb
Keppel Marine Agencies
International, LLC



11. Leong Siew Loon
Arab Heavy Industries
PR.J.S.C



12. Lam Khee Chong
Baku Shipyards, LLC

Key Personnel

Overseas Operational Centres

Arab Heavy Industries PR.J.S.C

Leong Siew Loon
Managing Director

PT Bintan Offshore

Max Goh Han Bin
General Manager

Keppel Philippines Marine, Inc

Chor How Jat
Chairman

Leong Kok Weng
President

Stefan Tong Wai Mun
Executive Vice President

Keppel Batangas Shipyard, Inc

Wong Jen Ming
President

Keppel Subic Shipyard, Inc

Ezra Chiam Soon Lin
President

Spencer Leong Chee Wah
General Manager

Keppel Offshore & Marine USA, Inc

Lai Ching Chuan
President

Tommy Sam Yui Sing
Vice President

Cheung Tak On
Vice President
Technology

Keppel AmFELS, LLC

Simon Lee Kim Foong
President

Eric Phua Hwan Khoon
Vice President
Commercial

Dennis Tan Boon Wei
Vice President
Finance

Keppel FELS Brasil S.A.

Kwok Kai Choong
President and
Chief Executive Officer

Tommy Sam Yui Sing
Vice President

Samuel Wong Chung Han
Chief Financial Officer

Gilberto Israel
Commercial Director

Karina Stoff Fonseca Mendonca
Legal and HR Director

Alceu Mariano De Melo Souza
Institutional Relations Director

Estaleiro BrasFELS Ltda

Martin Khiew Huey Kang
President

Luiz Carlos Caetano Dos Santos
Operations Director

Keppel Verolme BV

Harold W.M. Linssen
Managing Director

Gurbanov Elshan
Chief Financial Officer

Caspian Shipyard Company, LLC

Lau Kuat Pin
Chief Executive Officer

Keppel Nantong Shipyard Co. Ltd Keppel Nantong Heavy Industry Co. Ltd

Edmund Lek Hwee Chong
President

Wong Phuay Cheng
Vice President
Operations

David Lim Kok Hwee
Vice President
Finance

Li Gang
Vice President
Commercial

Nakilat-Keppel Offshore & Marine Ltd

David Loh Tah Huay
Chief Executive Officer

Felix Allen Jerome
General Manager
Operations

Regency Steel Japan Ltd

Wong Chun Yu
President

Naoya Hachigoh
Chief Operating Officer

Keppel Singmarine Brasil Ltda

Loh Kee Huat
General Manager

Baku Shipyard, LLC

Lam Khee Chong
General Manager

Keppel LeTourneau

Dr Foo Kok Seng
Chief Executive Officer/President

Keppel LeTourneau USA, Inc
Dr Lee Chay Hoon
Senior Vice President

Keppel LeTourneau Middle East FZE
Mohsen Mohamed Mahmoud Abdelalim
General Manager

Engineering/ Technology Centres

Keppel Offshore & Marine Technology Centre Pte Ltd

Michael Chia Hock Chye
Managing Director

Aziz Amirali Hasham Merchant
Executive Director

Dr Foo Kok Seng
Executive Director
Shallow Water Technology

Charles Sim Paik Huat
Technical and Projects Director
Gas Technology and Offshore Production

Anis Altaf Hussain
Programme Director
Deepwater Technology

Dr Matthew Quah Chin Kau
Senior Programme Manager
Offshore Structures and Analysis

Offshore Technology Development Pte Ltd

Dr Foo Kok Seng
Executive Director

Lim Ah Cheng
General Manager

Dr Matthew Quah Chin Kau
General Manager
Design

Deepwater Technology Group Pte Ltd

Aziz Amirali Hasham Merchant
Executive Director

Gas Technology Development Pte Ltd

Charles Sim Paik Huat
General Manager

Marine Technology Development Pte Ltd

Aziz Amirali Hasham Merchant
Executive Director

Anis Altaf Hussain
General Manager

Blue Ocean Solutions Pte Ltd

Dr Jerry Ng Kok Loon
Chief Executive Officer

Bennett Offshore, LLC

Marc Wong
President

Keppel FloaTEC, LLC

Tapan K.Das
President

Keppel FELS Baltech Ltd

Lyudmil Stoev
General Manager

Keppel FELS Engineering Shenzhen Co. Ltd

Tan Leong Peng
Director

Keppel FELS Engineering Wuhan Co. Ltd

Tan Leong Peng
Director

Keppel Offshore & Marine Engineering Services Mumbai Pte Ltd

Tan Leong Peng
Director

Representative Offices

Keppel Marine Agencies International, LLC

Michael Holcomb
President/Director

Keppel Prince Engineering Pty Ltd

Charles Chiam Toon Thong
Director

Marine Services

Asian Lift Pte Ltd

John Chua Bee Hin
General Manager

Keppel Smit Towage Pte Ltd

Pieter Van Stein
Managing Director

Jerry Wong Yoke Min
General Manager

Keppel Sea Scan Pte Ltd

Gui Eng Hwee
General Manager

Employee Unions

Keppel Employees Union

Razali Bin Maulod
President

Atan Enjah
General Secretary

Keppel FELS Employees Union

Vincent Ho Mun Choong
President

Atyyah Binte Hassan
General Secretary

David Lim Kin Wai
Executive Secretary

Shipbuilding & Marine Engineering Employees' Union

Tommy Goh Hock Wah
President

Eileen Yeo Chor Gek
General Secretary
NTUC Central Committee Member

Mah Cheong Fatt
Executive Secretary

Operations Review & Outlook

Significant Milestones

Delivered four KFELS B Class jackup rigs, one to Qatar and three to Mexico.

JV with Shell Eastern Petroleum won the license to supply LNG bunker to vessels in the Port of Singapore.

Delivered first liftboat built to Keppel's proprietary Orca design.

Secured four FPSO projects.

Completed the acquisition of the LETOURNEAU™ jackup rig design, rig kit business, as well as aftersales and aftermarket services.

Entered into a shareholders' agreement with Rosneft Oil Company and MHWirth to set up a Singapore incorporated JV to focus on the design and engineering of mobile offshore drilling units for shallow waters.

Delivered a high-specification deepwater derrick lay vessel.

Delivered one of the world's largest Harsh Environment Enhanced Mobility land rigs.

Secured contracts to build three Trailing Suction Hopper Dredgers.

Delivered fifth anchor handling tug to Seaways.

Delivered fifth accommodation semisubmersible to Floatel International.

Delivered Malta's first LNG FSU

Secured contracts to build first two dual-fuel diesel LNG tugs.

Signed an MOU with Shell Eastern Petroleum to jointly explore opportunities to cater to the demand of LNG as a fuel in coastal areas, inland waterways and the international marine sectors.

Delivered six FPSO projects, including one for the North Sea, one for Brazil, and one of the world's largest for operations in offshore Angola.

Amidst a challenging external environment, Keppel Offshore & Marine continues to streamline its operations, strengthen capabilities while tapping into new markets.

Resilient Operations

Despite weak demand in its industry globally, Keppel Offshore & Marine (Keppel O&M) performed creditably in 2016. It leveraged its extensive experience and wide spectrum of solutions to secure new contracts worth about \$500 million in non-drilling solutions. Notably, Keppel Singmarine secured its first dredger order from Jan De Nul, while BrasFELS won its fifth Floating Production Storage and Offloading vessel (FPSO) module fabrication and integration project from MODEC Offshore Production Systems (Singapore) Pte. Ltd (MODEC).

Keppel O&M also remains steadfast in the execution of its orderbook, delivering 21 major projects safely, on time and on budget. During the year, the Group completed four jackup rigs; an accommodation semisubmersible (semi); a semi upgrade; one of the world's largest Harsh Environment Enhanced Mobility land rigs; the conversion/integration/fabrication of six FPSO projects; the conversion of a Floating Storage Unit (FSU) vessel; a derrick lay vessel; a liftboat; an anchor handling tug; a transformer platform; the repair/upgrade of a field development vessel; a launch barge upgrade and a pipelay vessel.

To further strengthen resilience amidst headwinds, Keppel O&M took careful steps to rightsize its workforce and optimise resources while preserving core competencies. In 2016, Keppel O&M reduced its direct global staff strength by 35% while its subcontract workforce in Singapore came down by 13%. The sum of Keppel O&M's rightsizing efforts in 2016 resulted in a year-on-year reduction of \$150 million in overheads.

In tandem, we are cutting our yard capacity and have mothballed two overseas supporting yards. In Singapore, we are in the process of closing three supporting yards.

Notwithstanding the focus on rightsizing, the Group remains committed to investing prudently in new capabilities and exploring new markets and opportunities.

Seizing Opportunities

The liquefied natural gas (LNG) market is one of the bright spots in the market, given the global push towards adopting cleaner fuel technology. Expanding its gas-related business, Keppel O&M established a 50-50 joint venture (JV) with Shell Eastern Petroleum to supply LNG bunkering services in the Singapore port.



Keppel O&M secured four FPSO projects in 2016, including the topsides installation and integration on the BW Catcher.

The JV company, FuelNG, secured its first two contracts from Shell to provide bunkering services for Keppel Smit Towage and Maju Maritime's dual-fuel tugs, which are currently under construction in Keppel Singmarine.

Through the peaks and troughs in the industry, Keppel O&M has remained steadfast in cultivating customer relationships and continued to look out for new opportunities in niche markets. In 2016, it entered into a shareholders' agreement with Rosneft Oil Company and MHWirth to set up a Singapore incorporated company that focuses on the design and engineering of mobile offshore drilling units for shallow waters.

In addition, it completed the acquisition of the LETOURNEAU™ jackup rig designs, rig kit business, aftersales and aftermarket services during the year.

Drawing from the wide range of capabilities within the Keppel Group, Keppel O&M is also looking into adapting current technologies and know-how for new applications. The asset management arm of the Keppel Group, Keppel Capital, provides an avenue for the sourcing of co-investors to seize opportunities in large-scale projects.

Singapore Keppel FELS

2016 saw Keppel FELS delivering three jackups based on its proprietary designs to repeat customers, Gulf Drilling International and Grupo R.

The yard also delivered its fifth high-specification accommodation semi, Floatel Triumph, to Floatel International. The semi, which is built to Keppel's proprietary SSAU™ 5000NG design, has been chartered by Chevron Corporation for work in the Wheatstone field in Western Australia.

In addition to its strong capabilities in executing newbuild projects, Keppel FELS' experience in the repair of mobile offshore drilling rigs and semis continues to make the yard the preferred choice for customers worldwide. In 2016, Keppel FELS completed 18 repair and upgrading projects, with total contracts amounting to more than \$100 million.

Long-standing customer, Diamond Offshore, entrusted Keppel FELS with the refurbishment of semis Ocean Apex and Ocean Great White during the year. Other major repair work undertaken by the yard includes an Underwater Inspection In Lieu of Drydocking Survey (UWILD) on Transocean's semi rig, Jack Bates, as well as spud can upgrading works on PetroVietnam's first jackup rig, PVD-1.

Keppel O&M remains steadfast in the execution of its orderbook, delivering 21 quality projects in 2016 safely, on time and on budget.

Major Orders Secured

Business Unit	Contract	Customer
1Q		
Keppel FELS Brasil	FPSO modules fabrication and integration	MODEC
2Q		
Keppel Shipyard	FPSO topsides installation and integration	BW Offshore
Keppel Shipyard	FPSO turret fabrication	SOFEC
Keppel Shipyard	FPSO modification and upgrade	Woodside Energy
Keppel Shipyard	Pipelay vessel upgrade	Saipem Offshore
3Q		
Keppel Singmarine	Trailing Suction Hopper Dredger	Jan De Nul
Keppel Singmarine	Trailing Suction Hopper Dredger	Jan De Nul
Keppel Singmarine	Trailing Suction Hopper Dredger	Jan De Nul
Keppel Singmarine	Dual-fuel tug	Keppel Smit Towage
Keppel Singmarine	Dual-fuel tug	Maju Maritime

Built to Keppel's proprietary SSAU™ 5000NG design, Floatel Triumph, which was delivered in 2016, has been chartered by INPEX Operations Australia for work in Ichthys Field, off Western Australia.



Operations Review & Outlook

In response to the current business climate, Keppel FELS also selectively undertakes rig stacking to meet the needs of its customers. The yard not only ensures that customers' rigs are preserved in line with industry standards but are also ready for subsequent reactivation within the shortest time possible.

Over the year, Keppel continued to expand its capabilities and solutions with the acquisition of the LETOURNEAU™ suite of jackup rig designs, rig kit business, as well as its aftersales and aftermarket services. The acquisition adds to Keppel's comprehensive suite of jackup rig designs and also opens up aftersales and aftermarket services for more than 150 LETOURNEAU™ rigs in the market.

Keppel FELS is also actively pursuing opportunities in new markets, including non-drilling solutions, such as the design and construction of production units, floating gas solutions, power-generation vessels, as well as offshore wind-related projects.

In 2016, Keppel FELS worked with Keppel Infrastructure to develop a floating desalination plant as an alternative to the conventional onshore desalination plant. Offshore desalination and power plants meet the global need for power and water, especially in developing countries and land scarce areas. They are quick-to-implement, environmentally-friendly and mobile solutions.

Keppel FELS also tapped on its sister company, FloaTEC, for its expertise

in designing deepwater floating production systems to pursue production unit projects.

The strength of Keppel O&M's rig designs was recognised when the Institute of Engineers Singapore (IES) featured the semi DSS™ Series rigs and KFELS N Class rigs amongst Singapore's top 50 engineering feats.

Besides investing in R&D and building new capabilities to serve new markets, Keppel FELS remains committed to strengthening its safety culture. At the 2016 Workplace Safety and Health (WSH) Awards, Keppel FELS clinched 13 awards for its strong WSH management system.

Keppel Shipyard

An industry leader in vessel modification, upgrading and conversion, Keppel Shipyard secured two FPSO/FSRU (Floating Storage and Regasification Unit) projects from BW Catcher and Woodside Energy, as well as an FSO internal turret fabrication job from SOFEC in 2016. Keppel Shipyard was also awarded a pipelay vessel upgrade project from Saipem.

During the year, Keppel Shipyard also completed the conversion/integration of six FPSO/FSU projects, a pipelay vessel upgrading project, as well as the conversion of a Mobile Offshore Production Unit to Water Injection Facility. In particular, the yard delivered one of the world's largest FPSO vessels,

Armada Olombendo, to Bumi Armada for operations in offshore Angola. Bumi Armada also received its first LNG FSU, Armada LNG Mediterrana, as well as its first North Sea FPSO, Armada Kraken, from Keppel Shipyard.

Shiprepair continues to account for a significant proportion of Keppel Shipyard's work, with over 400 vessels serviced during the year, including 30 LNG carriers. A trusted partner in shiprepair, Keppel Shipyard secured jobs from repeat customers as well as new ones.

Through its subsidiary, Gas Technology Development, Keppel O&M entered into a Memorandum of Understanding (MOU) with Shell Eastern Petroleum during the year to jointly explore opportunities to cater to the demand of LNG as a fuel in coastal areas, inland waterways and the international marine sectors.

As a testament to Keppel Shipyard's commitment to execution and safety excellence, Keppel Shipyard garnered the Shipbuilding & Repair Yard award conferred by Seatrade Maritime as well as 15 WSH Awards in 2016.

Keppel Singmarine

2016 was a fruitful year for Keppel Singmarine with a number of contract wins and deliveries. Seizing opportunities to provide solutions for non-oil related marine operations, Keppel Singmarine clinched a contract from long-standing

Keppel Singmarine delivered McDermott's flagship derrick lay vessel, DLV 2000, which is built to Keppel's proprietary design and has been deployed to operate in the INPEX Ichthys Liquefied Natural Gas project in offshore Western Australia.



customer, Jan De Nul, to build three Trailing Suction Hopper Dredgers.

Keppel Singmarine also secured contracts to build its first pair of dual-fuel diesel LNG tugs for Maju Maritime (Maju) and Keppel SMIT Towage. The tugs are being built to Keppel's proprietary design, which won the Outstanding Maritime Research & Development and Technology Award at the Singapore International Maritime Awards in 2015. Keppel Singmarine has commenced work on the two units. Strengthening its presence in the LNG market, Keppel's joint venture, FueLNG, also secured its first two contracts from Shell to provide bunkering services for Keppel Smit and Maju's dual-fuel tugs.

The yard also continued to build on its shipbuilding track record with the delivery of a high-specification deepwater derrick lay vessel, DLV 2000, to Hydro Marine Services, a subsidiary of McDermott International. Built to Keppel's proprietary design, the vessel was immediately deployed for the INPEX Ichthys LNG project in offshore Western Australia after delivery.

The DLV 2000 received international acclaim when its innovative, state-of-the-art features were recognised with the coveted Best Ships Award for 2016 from Marine Log. It adds to Keppel Singmarine's strong record of designing and building more than 400 ships of various specifications and functions.

2016 also saw Keppel Singmarine deliver its fifth anchor handling tug, Seaways 24, to Seaways International, on time and with a perfect safety record.

During the year, Keppel Singmarine made notable progress on several major projects. Everest, an ice-class multipurpose vessel for New Orient Marine, a subsidiary of Maritime Construction Services, was launched successfully. Everest is Keppel Singmarine's 11th ice-class specialised newbuild and is on track for completion in mid-2017.

In recognition of Keppel Singmarine's achievement in the engineering and delivery of Asia's first icebreakers in 2008, the project was selected as one of Singapore's top 50 engineering feats by IES.

On the safety front, Keppel Singmarine bagged the WSH Performance (Silver) Award and the WSH Innovation Award for its innovative solutions to improve safety and health standards in the workplace.

Comprehensive Rig Designs and Services with Acquisition of LeTourneau

In May 2016, Keppel O&M completed the acquisition of Cameron's offshore product division, which comprises the LETOURNEAU™ jackup rig designs, rig kit business, as well as its aftersales and aftermarket services. The acquired company operates as Keppel LeTourneau with offices in the United States, United Arab Emirates and Singapore.

The acquisition not only broadens Keppel O&M's suite of jackup rig designs but also expands its business in the provision of aftersales and aftermarket services. Adding the LETOURNEAU™ designs to its own offerings, Keppel will have more than 26 designs for jackup rigs covering almost every requirement and condition in the market.

Keppel will have the flexibility to customise and build the LETOURNEAU™ jackup rigs from Keppel yards worldwide or license the design to any client or shipyard through the sale of rig kits. The rig kits include jackup leg components, elevating units/jacking systems and cantilever/skidding systems.

Another important aspect of the business is the provision of aftersales and aftermarket services. This includes the sale of spare parts, field service (troubleshooting, inspection, installation and commissioning), operator training, repair and refurbishment of equipment and bespoke engineering services.

Some 260 or 40% of the jackup rigs currently in the market belong to either LETOURNEAU™ or Keppel designs. Of these, more than 100 rigs are over 15 years old and require regular servicing. Besides repairs, upgrades and modifications, jackup rigs are required to undergo five-year class recertification special periodic surveys.

With 20 yards and offices around the world which are near market and near customer, Keppel O&M will be able to service LETOURNEAU™ rigs for their owners wherever they are, more quickly and efficiently, expediting the rigs' return to work.

As a jackup rig is made up of thousands of components, Keppel O&M's comprehensive supply chain management system will ensure that it is able to provide the spare parts required in aftersales and aftermarket services in a timely and cost-effective manner to its customers.



Having built 16 LETOURNEAU™ rigs previously, including the Papaloapan (pictured) of the LETOURNEAU™ Super 116E design, Keppel O&M has the expertise to build and service such rigs for its customers around the world.

Operations Review & Outlook

Asia

Keppel Nantong Shipyard/ Keppel Nantong Heavy Industry

Keppel's two yards in Nantong, China, continue to provide strong support for Keppel O&M's projects. In 2016, Keppel Nantong Heavy Industry supported Keppel FELS in the construction of pontoons, columns, as well as the upper hull of a semi. Its sister yard, Keppel Nantong Shipyard, constructed two units of 65-tonnes bollard pull Azimuth Stern Drive tugs slated for delivery to an Indonesia-based owner.

To enhance the Group's competitiveness, both Keppel Nantong Shipyard and Keppel Nantong Heavy Industry regularly review current practices and strategies. During the year, a cost-control taskforce was set up to boost the productivity and competitiveness of both facilities.

Keppel Batangas Shipyard

In the Philippines, Keppel Batangas Shipyard repaired over 50 vessels in 2016, including 12 foreign vessels. A number of the projects are from repeat customers, including Magsaysay Ship management and Translift Ship Management.

During the year, the yard also constructed two 50-tonnes Bollard Pull Azimuth Stern Drive tugboats in anticipation of demand. The tugboats are designed for berthing and unberthing of vessels in the harbour as well as towage in coastal waters.

Keppel Subic Shipyard

Meanwhile, Keppel Subic Shipyard repaired over 20 foreign and local vessels. The yard also provided daily maintenance to two stacked jackups belonging to Atwood Oceanics and is also poised for re-activation work on the rigs once the drilling market recovers.

With its 1,500 tonnes gantry crane and robust drydock facilities, Keppel Subic Shipyard is also equipped to fabricate offshore structures and topside modules, thereby complementing Keppel Shipyard in executing FPSO conversion works.

The Americas

Keppel FELS Brasil

Notwithstanding the current political and market challenges, Brazil is expected to remain as an important oil and gas market in the long-term given its significant offshore oil and gas reserves. Brazil's national oil company, Petrobras, has earmarked significant funds for Exploration & Production (E&P) investments. In September 2016, Petrobras announced its 2017-2021 Business and Management Plan, which calls for investments amounting to US\$74.1 billion, 82% of which are earmarked for E&P. Foreign oil companies such as Shell, Total and Statoil have also expressed interest to increase their investments in Brazil.

In 2016, Keppel FELS Brasil's yard in Angra dos Reis (Rio de Janeiro), BrasFELS, continued to deliver milestone projects for

Brazil. It completed the integration and completion works on FPSO Cidade de Caraguatatuba MV27 for MODEC. The FPSO has been deployed to support Petrobras' operations in the Lapa oilfield of the Santos Basin, Brazil. The successful delivery to MODEC was a result of the strong synergy between BrasFELS and Keppel Shipyard, which undertook the first phase of integration works. The vessel is BrasFELS' fourth FPSO project for MODEC since 2012, with all four projects delivered safely and ahead of schedule.

Building on the longstanding partnership, MODEC awarded another FPSO module fabrication and integration project to BrasFELS during the year. BrasFELS' work scope for this project comprises the fabrication and integration of nine topside production modules for the FPSO Cidade de Campos dos Goytacazes MV29. The vessel arrived at the shipyard in 1Q 2017 for integration.

As one of the most established offshore and marine facilities in the Latin American region, BrasFELS continued to diversify its repair client-base, securing repair jobs for the first time from Ocean Rig UDW, a Greece-based offshore drilling contractor, and Helix Energy Solutions.

Since the end of 2015, BrasFELS has stopped work on the semis for Sete Brasil due to non-payment by the latter. Sete Brasil is working with a financial advisor on its restructuring plan and has filed for judicial recovery.

Keppel AmFELS delivered one of the world's largest land rigs 41 days ahead of schedule and with a strong safety record.



Keppel AmFELS

In the United States (US), Keppel AmFELS successfully delivered one of the world's largest Harsh Environment Enhanced Mobility land rigs 41 days ahead of schedule and with a strong safety record. The delivery marks the first land rig of its type to be built by Keppel, reflecting Keppel's continuous drive to look for new opportunities to service its customers.

2016 also saw Keppel AmFELS delivering Uxpanapa, a KFELS B Class jackup rig, to Mexico's Central Panuco, a subsidiary of Perforadora Central. Uxpanapa is the fifth jackup rig built by Keppel AmFELS for Perforadora Central and it will be chartered by PEMEX, the Mexican national oil company, for work in offshore Mexico.

While the offshore market for newbuild jackups remains challenging, there continue to be opportunities in rig repairs, conversions and reactivation, as well as prospects to build vessels under the Jones Act for the US market.

Caspian Sea Caspian Shipyard Company

Despite the challenging conditions in the oil and gas market, Caspian Shipyard Company (CSC) made steady progress on several projects in 2016.

The yard delivered a purpose-built jacket transportation and launch barge, the STB-1, to BP Exploration (Shah Deniz) on schedule, safely and within budget. Work on the vessel included strengthening

the steel structure of the hull and Class Renewal. Harnessing the synergy of Keppel O&M's yards worldwide, Keppel FELS lent its expertise to the prefabrication of steel structures and installation, Special Periodic Survey re-certification, as well as inclination trials.

Another project delivered during the year is the upgrade of the semi drilling rig, Istiglal, for Caspian Drilling Company (CDC), a subsidiary of the State Oil Company of Azerbaijan Republic (SOCAR). The rig underwent upgrading and refurbishment at the yard and departed for final commissioning works in June 2016. Istiglal has been chartered to work for BP in the Shah Deniz field.

A third major project undertaken at CSC is the newbuild construction of Azerbaijan's first modern semi for CDC. The rig is being built to Keppel's proprietary DSS™ 38M design, which has been customised for the Caspian Sea's harsh environment conditions. Work on the project is in the advanced stages, with the final stages of testing and commissioning in progress. The project is yet another testimony of the strong synergies between Keppel O&M's global network of yards, with CSC undertaking the fabrication, integration, testing and commissioning of the rig while its joint venture yard with SOCAR, Baku Shipyard, fabricating the pontoons and columns. Over in Singapore, Keppel FELS provided engineering, procurement and technical support.

Keppel O&M is actively pursuing opportunities in new markets, including non-drilling solutions, such as the design and construction of production units, floating gas solutions, power-generation vessels, as well as offshore wind-related projects.



Harnessing the synergies of Keppel O&M's yards, Caspian Shipyard Company is partnering Keppel FELS on the newbuild construction of Azerbaijan's first modern semi.

Operations Review & Outlook

Despite the challenging conditions in the oil and gas market, Keppel's yard in Azerbaijan continues to be busy with several projects, including the newbuild construction of Azerbaijan's first modern semisubmersible for CDC.

Baku Shipyard

2016 was also a busy year for Baku Shipyard. It completed 22 repair and upgrade projects and delivered three 80-passenger crewboats, Ufuq, Zafar and Turan, to Azerbaijan Caspian Shipping Company (ACSC). The crewboats have been chartered to oil field operators in Azerbaijan.

The shipyard is currently constructing a Subsea Construction Vessel (SCV) for deployment to the Stage 2 development of the Shah Deniz field in the Azerbaijan sector of the Caspian Sea. Designed by Marine Technology Development, the ship design and development arm of Keppel O&M, the vessel is expected to be completed in 3Q 2017. Keppel Singmarine designed and carried out fabrication and outfitting works while the bow block construction, integration and commissioning work were done by Baku Shipyard. Integration of the strips and forward blocks has been completed while start-up and load-test have also been successful.

Deepening its presence in Azerbaijan, Baku Shipyard won contracts to build two Ro-Pax ferries and two crude oil tankers for Azerbaijan Caspian Shipping Company. Baku Shipyard continues to explore opportunities to service customers in the Caspian Sea region, including Turkmenistan,

Kazakhstan and Iran. Within Azerbaijan, it is also looking to undertake onshore oil and gas projects as well as naval ship projects for the Navy of Azerbaijan.

There could be also an increase in demand for logistics support vessels, which Baku Shipyard is well-equipped to build.

North Sea Keppel Verolme

Over in Rotterdam, the Netherlands, Keppel Verolme delivered several key repair jobs during the year, including four passenger ships to P&O Ferries for periodic maintenance; a container vessel, Hyundai Drive, for steel repairs; Boskalis' cable lay vessel Ndurance which underwent modification work for offshore wind farm projects; as well as the repair of Jan De Nul's dredger, Bartolomeu Dias. Keppel Verolme also secured a contract for the repair and renewal of Heerema Marine Contractors' semi heavy lift vessel, Hermod.

The ratification of the water ballast treatment treaty by the International Maritime Organisation (IMO) has resulted in more enquiries for ballast water management system installation. Offshore wind development in the North Sea has also been encouraging and the need for special vessels ranging from cable lay vessels to rock dumping vessels could increase.



Keppel Verolme continued to receive repair and modification projects in 2016 on a variety of vessels such as a RO-RO cargo vessel (pictured) and an oil product/chemical tanker.

Middle East Yards

Nakilat-Keppel Offshore & Marine

Nakilat-Keppel Offshore & Marine (N-KOM), the joint venture shipyard between Qatar Gas Transport Company (Nakilat) and Keppel O&M, delivered its first liftboat, Al Safliya, to Qatari rig operator Gulf Drilling International (GDI), in a safe and timely manner without any lost-time incidents. Built to the ORCA 2500 design developed by Keppel O&M's design arm, Bennett Offshore, Al Safliya is the first liftboat to be wholly constructed in Qatar. The self-propelled elevating unit has been customised for operations in the Middle East and North Africa region in water depths of up to 65m.

Situated at the crossroads of the Arabian Gulf, N-KOM is strategically located to service the vessels plying in the Middle East region as well as gas carriers that call at the nearby Ras Laffan terminal in Qatar. With over 100 vessels repaired in 2016, N-KOM continued to maintain its regional ship repair market share. The vessels repaired included tankers, LNG carriers, Liquefied Petroleum Gas (LPG) carriers, containers and bulk carriers.

One of the new additions to the shipyard's growing clientele in 2016 is Zen Shipping, which sent its 14,000 dwt chemical tanker Bon Atlantico to N-KOM for routine drydocking and hydraulic pipe repairs during the year. Apart from tanker repairs, N-KOM also took on repairs for a number of bulk carriers such as Charterwell Maritime's Diane and Milaha's Qatar Spirit. During the year, N-KOM also entered into fleet agreements with the Angelicoussis Shipping Group of companies and Samos Steamship Company.

Separately, an MOU was signed between N-KOM and Mcdermott International Inc. for an exclusive cooperation agreement to pursue offshore engineering, procurement, construction and installation (EPCI) projects within Qatari waters.

To enhance its service offerings and increase flexibility to repair vessels that are in voyage, N-KOM established the Electrical Flying Squad, Mechanical Flying Squad and LNG Flying Squad to complement its drydocking service in the yard.

Arab Heavy Industries

Amidst strong competition for shiprepair work, Arab Heavy Industries (AHI) repaired a creditable 131 vessels in 2016. AHI added 13 new clients to its clientele, including Shin Yang, Link Energy, Theqat Al Khaleej Diesel Trading, Levant Marine Group, Macon Charterer & Marmar Shipping & Trading.

Providing End-to-End LNG Solutions

To bolster its efforts in the LNG-related business, Keppel O&M, through its subsidiary Gas Technology Development, signed an MOU with Shell Eastern Petroleum, to jointly explore potential opportunities to cater to the demand of LNG as a fuel in coastal areas, inland waterways and the international marine sectors.

The partnership leverages Keppel's strengths in shipbuilding and design, and Shell's experience as a global leading energy supplier to work with potential customers to develop technical and commercial solutions for their LNG fuel needs.

For a start, Keppel and Shell will be focusing on engine retrofit for ocean-going vessels and freshwater tugs, and development of coastal LNG storage infrastructure for industrial and marine customers.

This adds to the 50/50 joint venture company between Keppel O&M and Shell Eastern Petroleum, FueLNG, to supply LNG bunkering services in the Singapore port. FueLNG has already secured its first two contracts from Shell to provide bunkering services for Keppel Smit Towage and Maju Maritime's dual-fuel tugs which are currently under construction in Keppel Singmarine.

Mr Michael Chia, Managing Director (Marine & Technology) of Keppel O&M, said, "Apart from relying on our in-house R&D, we are collaborating with leading players in the energy sector that have capabilities complementary to Keppel's to develop comprehensive and innovative solutions in LNG. Through this cooperation framework, Keppel and Shell can combine our resources and expertise as a leading global shipbuilder and energy supplier, and work together in collaboration with stakeholders such as shipping companies, terminal operators, local governments and regulators to meet their needs which may include engine retrofit or setting up coastal LNG storage infrastructure."

Keppel's shipbuilding/design capabilities and LNG bunkering services provide end-to-end solutions for vessel owners turning to LNG as a marine fuel in Singapore.



Keppel Singmarine is building two dual-fuel tugs to Keppel's proprietary design which won the Outstanding Maritime R&D and Technology Award at the 2015 Singapore International Maritime Awards.

Operations Review & Outlook

Keppel O&M is equipped to capture a wide range of opportunities in the gas value chain with its solutions for both onshore and offshore liquefaction as well as LNG transportation solutions.

Construction of the newbuild self-installation platform MTCC Bubiyan Fanar for Toa Corporation has also progressed to an advanced stage, and is expected to be delivered by the middle of 2017.

Support Services

Asian Lift

The addition of the high-capacity 5,000-tonne sheerleg crane, Asian Hercules III, broadens Asian Lift's market coverage, enabling it to perform offshore installations and decommissioning work. Asian Hercules III is the world's most powerful and flexible heavy-lift sheerleg crane of its kind and has been put to good use on a number of projects, lifting over 27,000 tonnes of work in total.

Some significant projects undertaken by Asian Hercules III include the lifting of the world's largest external turret for integration with the FPSO Prof. John Evans Atta, the lifting of a BTM Buoy for Shell's FPSO Turritella onto a transport vessel as well as the lifting of modules for Bumi Armada's FPSOs, Kraken and Armada Olombendo.

Other cranes in Asian Lift's fleet include the 400-tonne Asian Helping Hand III, the 1,600-tonne Asian Hercules and the 3,200-tonne Asian Hercules II. Forged from a strategic partnership between Keppel FELS and Smit (Singapore) in 1985, Asian Lift today enjoys a strong presence in the Asia Pacific region.

Efforts have been made to extend its reach in the region. Together with Smit Singapore, Asian Lift secured the Thien Ung project in Vietnam and the NASR project in UAE. The Thien Ung project was contracted in May 2016 and the project was successfully completed in September 2016. The NASR project is scheduled for execution in 2Q 2017. In Singapore, the Tuas megaport development will offer long-term opportunities for Asian Lift's services.

With a focus on safety, Asian Lift achieved an impressive zero lost time incident rate in 2016.

Keppel SMIT Towage/Maju Maritime

The volume of towage work in Singapore decreased slightly in 2016 as compared to 2015. Amidst the headwinds, Keppel Smit Towage continued to rationalise its fleet size in order to adapt to the difficult business environment.

Market conditions in Malaysia were challenging, with rising competition and depressed time charter rates. In Indonesia, time charter rates also faced downward pressure as a result of declining oil prices and cost cutting measures by oil companies.

Keppel SMIT Towage's business in China has been impacted by its slowing economy, while the volume of its Taiwan towage business remains stable.

The management of Keppel O&M and Bumi Armada celebrating the sailaway ceremony of Armada LNG Mediterranean, a LNG Floating Storage Unit, together with Dr Joseph Muscat (sixth from left), Prime Minister of the Republic of Malta.



Looking ahead, Keppel Smit Towage will continue its efforts in streamlining its organisational structure and fleet size, while optimising its financing strategy, personnel deployment and resources to focus on selected growth markets.

Industry Review & Outlook

The oil price increase in late 2016 partly reflects a tighter supply and demand situation as well as improved sentiments which resulted from the landmark decision by OPEC to cut production by 1.2 million bpd, along with a production reduction of 600,000 bpd by key non-OPEC countries such as Russia. Focus will be on the response of US tight oil production which could in turn limit oil price increases in 2017. Capex of oil and gas companies remains subdued, as the companies wait for oil prices to stabilise and settle at a sustainable level.

As the industry hunkers down to survive, the Singapore Ministry of Trade and Industry (MTI) has announced support measures for marine and offshore engineering companies to access working capital and financing.

In the long term, the hold-back in oil and gas exploration and drilling in recent years would eventually lead to an undersupply and higher oil price. It is therefore unsurprising that interest in Mexico's deepwater licensing round in December 2016 had been encouraging, with sixteen international companies grouped in ten bidders competing for the 10 blocks on offer. Eight of the 10 blocks were awarded, seeding potentially higher demand for offshore drilling and production services in the years to come. BP approved the US\$9 billion Mad Dog 2 project, while Total, China National Petroleum Corp

Major Projects Delivered in 2016

	Quarter	Type	Customer	Shipyard
Offshore				
Newbuilds and Integration				
Halul	1Q	KFELS B Class jackup	Gulf Drilling International	Keppel FELS
Cantarell I	1Q	KFELS B Class jackup	Grupo R	Keppel FELS
Cantarell II	1Q	KFELS B Class jackup	Grupo R	Keppel FELS
Global Tech 1	1Q	Jackup transformer platform	Global Tech 1 Offshore Wind GmbH	Keppel Verolme
Al Safliya	1Q	Orca 2500 liftboat	Gulf Drilling International	N-KOM/Keppel Singmarine
Undisclosed	2Q	Land rig	Undisclosed	Keppel AmFELS
Uxpanapa	3Q	KFELS B Class jackup	Perforadora Central	Keppel AmFELS
Floatel Triumph	3Q	Accommodation semisubmersible	Floatel	Keppel FELS
Upgrading and Repairs				
Istiglal	2Q	Semisubmersible upgrade	Caspian Drilling Company	Caspian Shipyard Company
Marine				
Conversions, Repair and Upgrade				
Siapem FDS	1Q	Field development vessel repair/upgrade	Saipem	Keppel Shipyard
STB-1	2Q	Launch barge upgrade	BP Exploration	Caspian Shipyard Company
Cidade de Caraguatatuba MV27	2Q	FPSO integration	MODEC/Toyo	Keppel FELS Brasil/ Keppel Shipyard
Armada Olombendo	3Q	FPSO conversion	Bumi Armada	Keppel Shipyard
Armada Olombendo	3Q	FPSO topside fabrication	Bumi Armada	Keppel Shipyard
Armada Olombendo	3Q	FPSO turret fabrication	Bumi Armada	Keppel Shipyard
Armada Kraken	3Q	FPSO conversion	Bumi Armada	Keppel Shipyard
Armada LNG Mediterrana	3Q	FSU conversion	Bumi Armada	Keppel Shipyard
Castorone	3Q	Pipelay vessel upgrade	Saipem	Keppel Shipyard
Karapan Armada Sterling III	4Q	FPSO conversion	Bumi Armada	Keppel Shipyard
Newbuild Vessels				
DLV 2000	2Q	Derrick lay vessel	McDermott	Keppel Singmarine
Seaways 24	3Q	Anchor handling tug	Seaways	Keppel Singmarine

Operations Review & Outlook

and National Iranian Oil Co. have signed a heads of agreement to develop Iran's South Pars gas field with an investment estimated at US\$6 billion.

Meanwhile in the Middle East and India, offshore exploration and production activities remain robust, as national oil companies cash in on lower dayrates in the region.

Offshore Rigs

Despite the gradual recovery in oil price, demand in the offshore rigbuilding market is expected to remain tepid. Oversupply of rigs remains a key concern, worsened by the overhang of rigs still under construction.

While E&P companies continue to be prudent in their capex, there are pockets of opportunities for niche products. For example, Statoil plans to drill around 30 exploration wells in 2017, an increase of about 30% compared to 2016. More than half of the wells will be drilled on the Norwegian Continental Shelf.

The demand for rig aftersales and aftermarket services could provide another source of recurring income for Keppel O&M. With the combined capabilities, network and installed base of Keppel FELS and Keppel LeTourneau rigs, Keppel O&M is poised to provide better value-added solutions to drilling operators.

Ship Repair

The outlook of merchant shipping remains challenging even as global trade growth is forecasted to increase across all shipping sectors. Similar to the offshore rig market,

persistent overcapacity continues to plague the shipping industry, with the tanker and containership sectors being the most affected. Tanker rates are likely to remain volatile with OPEC countries agreeing to cut oil production. For containerships, more consolidation activities can be expected as the sector is still fragmented with many container lines having a market share of less than 3%. For the LNG carrier and dry bulk sectors, low rates are likely to continue in the near future albeit with optimism for recovery as trade growth may eventually outpace the production of new tonnage.

With a relatively young global merchant ship fleet, the scope for repairs is generally small. Moreover, ship owners with tighter capital expenditure budgets are only carrying out essential ship repairs. Price competition between yards has also impacted revenues and margins.

Keppel O&M will continue to strengthen the engagement of its existing clientele while reaching out to new clients to expand its market base. Besides looking to increase the number of repair projects, Keppel O&M will also continue to improve turnaround-time and streamline operations to improve margins.

Floating Production Systems

According to the Energy Maritime Associates' (EMA) 2017-2021 Floating Production Systems Outlook Report, costs and oil prices are starting to rebalance with three FPSOs ordered in 4Q 2016. Between 83 and 168 floating production

systems are expected to be ordered over the next five years, with a mid-case forecast of US\$86 billion to be spent on 119 units.

To maximise operational efficiency in response to the challenging industry conditions, contractors and shipyards are moving towards greater standardisation to reduce cost and shorten delivery times. Keppel O&M will continue to monitor the pipeline of projects in the market and proactively engage customers to seek win-win partnerships.

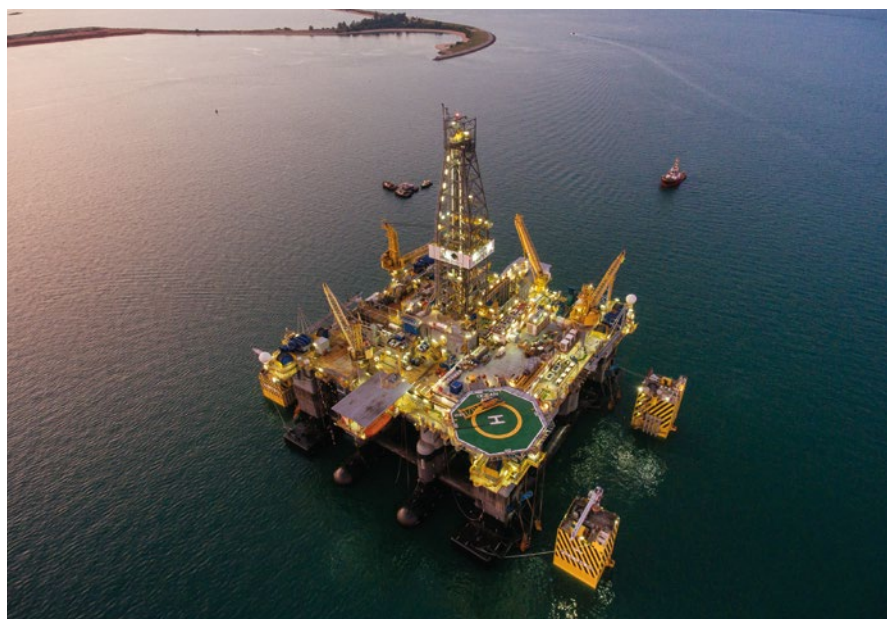
Gas Solutions

The use of LNG as an alternative marine fuel is on the rise as a result of emissions reduction goals set by the IMO and the United Nations Climate Change Conference.

With lower charter rates for LNG Carriers, owners are more open to redeploying existing assets, potentially as FSRUs. In terms of demand, lower gas prices also incentivise power plant operators to use gas, leading to more enquiries for FSRUs. Building on its track record for complex offshore conversion projects and experience in delivering FSRU conversions, Keppel O&M is poised to meet demand for FSRUs.

Meanwhile, Keppel Shipyard's execution of the world's first-of-its-type FLNG vessel conversion for Golar LNG is progressing on track. The deployment of Golar Hilli FLNG vessel in mid-2017 will put Keppel ahead of the curve for floating LNG solutions.

Keppel O&M is also equipped to capture a wide range of opportunities in the gas value chain with its solutions for both onshore



Keppel FELS completed 18 repair and upgrading projects in 2016, including the upgrading job on semisubmersible, Ocean Apex (pictured), for repeat customer Diamond Offshore.

and offshore liquefaction as well as LNG transportation solutions including LNG carriers, tugs designed with dual-fuel diesel LNG engines, as well as capabilities in retrofitting vessel engines to run on LNG.

Specialised Shipbuilding

While the offshore supply vessel market remains lacklustre in the near term, Keppel Singmarine continues to pursue opportunities in niche markets, including subsea construction vessels and ice-class vessels.

There remain opportunities in non-oil related shipbuilding such as the dredger market, with many dredging companies such as Jan De Nul Group and National Marine Dredging Company (NMDC) defying the global slowdown by posting strong performances. Having made inroads in the dredger newbuild market through the contract win to build three dredgers for Jan De Nul, Keppel Singmarine will continue to engage other customers and promote its dredger offerings.

The renewal of the Jones Act vessel fleet for the US market presents another sizeable opportunity for Keppel O&M. The US-built fleet is considerably older than the global, non-US built fleet as a consequence of the Jones Act, which requires vessels travelling between US ports to be US built, owned and flagged. The current US-built fleet is about 33-years old on average, compared to 13-years old for the global fleet. Through Keppel AmFELS in Brownsville, Texas, Keppel O&M is well-placed to capture opportunities in the replacement cycle for the aging Jones Act fleet.

Expanding Expertise in Specialised Vessels with Dredger Contract

Keppel Singmarine secured a contract to build its first three Trailing Suction Hopper Dredgers (TSHDs) for the Jan De Nul Group. The TSHDs are worth about \$100 million in total.

To be built to Jan De Nul's design, the vessels will be able to dredge to a maximum depth of 27.6m and will have a hopper capacity of 3,500m³. The two dredgers will be built to the requirements of classification society, Bureau Veritas, in Keppel Nantong Shipyard, a subsidiary of Keppel O&M.

Mr Abu Bakar, Managing Director of Keppel Singmarine, said, "We are pleased to receive these new contracts from long-standing customer Jan De Nul. Across the group, we have undertaken a number of newbuild dredger projects as well as repairs for customers such as Jan De Nul. We are always on the lookout to add value to our customers and markets and this project is a natural extension of Keppel Singmarine's strong track record and expertise in specialised vessels. This is also in line with our efforts to deepen our presence in non-oil and gas markets where we can leverage our capabilities."

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

Mr Robby De Backer, Director of Newbuilding Department of Jan De Nul Group, said, "We are pleased to build our next dredgers with Keppel Singmarine to meet the needs of the market. We need such compact dredgers for maintenance work, for coastal restoration and for a variety of land reclamation work around the world. We are confident that Keppel Singmarine with its expertise and experience will provide us with robust, reliable and advanced dredgers in a safe and timely manner."



The new contracts for the Trailing Suction Hopper Dredgers are a natural extension of Keppel Singmarine's expertise in constructing specialised vessels.

Technology & Innovation

Overview

Keppel Offshore & Marine leverages innovation and technology to hone its capabilities and be at the forefront of providing leading-edge solutions to the market.



Research & Development Units

5

in-house design arms doing R&D on jackups, deepwater rigs, specialised vessels and LNG solutions.

Proprietary Designs

>70

designs spanning a variety of products from rigs to ships to processing systems across Keppel O&M.

Through the development of innovative technologies, we provide customised solutions to our clients in a variety of markets.

Keppel Offshore & Marine (Keppel O&M) is making prudent investments in research and development (R&D) to enhance our core competencies while developing innovative and improved technological offerings for existing and new markets.

Together with our in-house design and engineering arms, our business units work closely with industry partners, clients and academic institutions to offer robust solutions to meet the industry's needs.

Keppel O&M is also leveraging its expertise and extensive industrial know-how to explore opportunities in adjacent industries as well as non-oil and gas market segments.

Areas of Competencies

When pursuing new concepts and solutions, Keppel O&M considers their commercial viability, customers' needs, as well as how they can expand the company's knowledge pool and achieve process improvements.

We are also diversifying our efforts into non-oil and gas related projects where we leverage our existing experience, competencies and expertise to repurpose technologies for offshore energy and desalination projects.

Our technological innovation efforts are spearheaded by five divisions:

- Keppel O&M Technology Centre (KOMtech) focuses on developing offshore and marine competencies and conducting R&D to develop new technologies and processes.
- Offshore Technology Development (OTD) employs the foremost technology in the design of new generation jackup rigs and critical rig components, including jacking, fixation, self-positioning and skidding systems, which are all used on Keppel FELS jackup rigs.
- Deepwater Technology Group (DTG) focuses on deepwater rig designs, spanning semisubmersibles (semi) and various floating structures, such as drilling tenders, accommodation semis, drilling semis and drillships.

KOMtech's Areas of Competencies

Deepwater Technology/Subsea



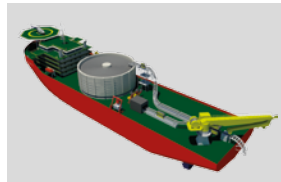
Shallow Water/Arctic/Wind



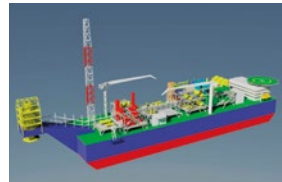
Drilling & Critical Equipment



Marine Technology



LNG/FPSO



Environmental



Shipyard Technology



- Marine Technology Group (MTD) specialises in the design and development of offshore support and maintenance vessels, dual-fuel tugs and specialised ships.
- Gas Technology Development (GTD) specialises in the development of a suite of gas solutions that can effectively bring Gas to Liquefied Natural Gas (LNG), LNG to Power and also utilise LNG as fuel.

Technological Expertise for the Future

Technology foresight drives Keppel O&M to be sustainable and market relevant. It enables KOMtech to identify potential technological developments in the foreseeable future that we can help shape.

KOMtech works closely with key business leaders on leading academic research programmes to develop innovative solutions that are commercially viable and adaptable to the needs of the industry. In addition to conceptualising next-generation solutions, KOMtech also embarks on R&D to create prototypes and collaborate with early adopters before the designs are submitted to Keppel O&M business units for commercialisation.

KOMtech's extensive research covers both deepwater technology and shallow water technology. The deepwater technology arm looks into areas such as seabed nodule harvesting, subsea, deepwater and ultra-deepwater drillships, ultra-harsh environment drilling semis, tension leg platforms, innovative dry tree semis (E-Semi) and innovative ship designs. The shallow water technology arm focuses on arctic jackup designs, offshore wind solutions, LNG applications and drilling solutions, including rig data analytics among others.

Innovative Designs

Revolutionary Low Motion Semi

The Low Motion Semi (LMS) is innovatively designed to offer versatility in its operations as it can be adopted for drilling, production, or accommodation in harsh, deep water and even arctic environments. Leveraging our experience in the newbuild and conversion of semis, the LMS is optimised for ease of construction, as well as safe and efficient operations.

It is able to achieve low motion characteristics and optimal station keeping capabilities using state-of-the-art technologies. These include deeper pontoon submergence to reduce wave excitation forces; multi-column spacing and size to tune heave cancellation effects; a multi-sided polygon hull that helps to reduce and equalise environmental loads; and a passive air chamber to provide additional stiffness. The platform is also configured with dynamic positioning and/or a mooring system capable of operating in harsh environments and deep waters.

The reduced motion characteristics allow the vessel to use a surface Blow Out Preventer (BOP) application which reduces drilling maintenance and operation costs. In harsh environments, the vessel's operability uptime increases from the current 60% to over 90% which equates to 100 days higher uptime in a year. The reduced motion characteristic of the LMS allows for surface BOP application in moderate sea conditions and also significantly improves operational uptime for subsea BOP application in harsh environments. The flexibility and scalability of the design translates to sizeable cost savings for our customers.

Dual-T Cantilever

Existing Keppel skidding systems operate primarily in the longitudinal direction. The new Dual-T cantilever skidding system allows the cantilever to operate in both the longitudinal and transverse directions with additional drillfloor transverse skidding. This added functionality improves the flexibility of drilling operations, and opens up additional possibilities, such as using the jackup rig in drilling and production modes. In addition to drilling operations, the new skidding system is designed to be more installation and maintenance-friendly.

Versatile Self-Installing Platform

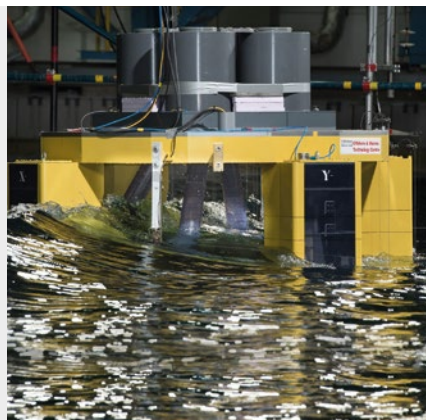
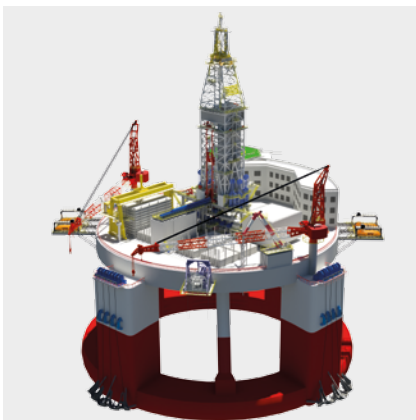
The Keppel Self-Installing Platform (SIP) is a suite of multi-functional fixed platform designs.

Leveraging Keppel's well-established proprietary jackup design and construction, the Keppel SIPs are robust, cost-effective and provide real estate that is adaptable for multi-functional uses.

Designed to self-elevate for both installation and removal and with easily removable leg-hull connection, the platforms can be quickly relocated to different sites and are suited for a wide range of water depths, soil and metocean conditions. Several platforms can be combined to form a large capacity unit and there is the option of reusing the jacking components across several units to further reduce costs.

Enhanced Energy Efficient Platform Supply Vessel

One of KOMtech's innovative collaborations with industry experts resulted in the design of the Enhanced Energy Efficient Platform Supply Vessel (EEE PSV). The EEE PSV



The Low Motion Semi (LMS; left image: artist impression) is innovatively designed for drilling, production, or accommodation in harsh and deep water environments. KOMtech recently completed its model test of the LMS (right image).

Technology & Innovation

incorporates the latest technologies using a direct current (DC) grid power distribution system, a battery, LNG as fuel and an improved hull form for fuel-efficient operations.

KOMtech worked with ASEA Brown Boveri (ABB) to develop DC grid solutions which enable the vessel to save up to 27% of fuel, resulting in 30% of weight savings of the electrical system. EEE PSV was also designed in collaboration with Det Norske Veritas (Norway) and Germanischer Lloyd (Germany) (DNV GL) where the DC Grid system integrated with battery storage has obtained approval in principal from DNV GL.

Unlike the alternating current (AC) system, this DC grid system design offers savings in weight and space due to the absence of the phase shift transformers and the main switchboards, allowing add-on features such as renewable energy in the form of solar power.

Adaptability of energy storage devices, such as batteries, to the power network is an added advantage of using a DC grid. This storage battery can supply the ship's power at low load (standby) operating conditions. The lower noise features at battery operation mode also heightens the crew's comfort compared to other powering options.

Subsea Construction Vessel, Khankendi

The Khankendi Subsea Construction Vessel (SCV) is planned to perform subsea construction activities for BP in the Shah Deniz field between 2017

and 2027. The unique vessel is designed by MTD and built to DNV GL's classification supervision.

The SCV measures 155m in length, 32m in width and has a 13m main deck. It is equipped with dynamic positioning to allow for work in 2.5m significant wave height (Hs), a 900-metric tonne (MT) main crane for 600m subsea operation and an 18-man two-bell diving system. Other features include two work-class remotely operated vehicles (ROVs); one moonpool for subsea operations; two separate moonpools for diving operations and two engine rooms with a carrying capacity in excess of 5,000MT at 6.5m draft.

The innovative project construction leveraged the synergy between Keppel Singmarine and Baku Shipyard, Keppel O&M's joint venture yard in Azerbaijan. The former built the vessel's hull as two longitudinal strips to allow safe passage through the narrow Volga-Don Canal, en route to Baku Shipyard, where it is being completed.

Derrick Lay Vessel, DLV 2000

Built to Keppel's proprietary design, the DLV 2000 is able to achieve efficient pipelay rates for long trunklines and can operate in severe weather conditions while maintaining significant thrust output and power distribution.

With a holding capacity of up to 400 personnel to facilitate large hook-up and commissioning projects, the vessel also has a transit speed of 14 knots and a 43,000 square-foot open

deck to transport and assemble large subsea structures, enabling it to undertake efficient standalone operations in remote areas safely. It is also designed to allow a deepwater 500-tonne flexlay system to be incorporated at a future date in addition to its existing S-lay functions, making the vessel a highly versatile asset which can be further customised to meet customers' evolving needs. The DLV 2000's flexibility and innovative state-of-the-art features resulted in the vessel winning Marine Log's Best Ships of 2016 award.

Delivered in June 2016, it is now serving McDermott as the flagship vessel in their fleet of global offshore pipelay and construction vessels.

Ice-Class Multipurpose Vessel, Everest

Everest, an ice-class multipurpose vessel being built to the proprietary design of MTD, was launched on 15 October 2016 and is scheduled for delivery in 2017. The vessel's capabilities include subsea construction, remotely operated vehicle operations as well as offshore fire-fighting and emergency oil spill responses. It can operate in ambient temperatures of as low as minus 30 degree celsius and will have an Ice-Class Arc 5 notation capable of operations in 1m thick open floating ice. It is also equipped with class 3 dynamic positioning and diving support functions.

Non-Oil and Gas Solutions Dredgers

Expanding its track record in specialised vessels, Keppel Singmarine is building three Trailing Suction Hopper Dredgers

Keppel developed a floating desalination plant design that has high maneuverability, is versatile and has efficient desalination capabilities.



LNG Solutions Along the Gas Value Chain

With the International Maritime Organisation's global 0.5% cap on sulphur content of marine fuel coming into force in 2020, demand for LNG as a marine fuel is expected to increase. This is also in line with the Maritime Port Authority of Singapore's objective of establishing Singapore as an LNG bunkering port by 2020. In anticipation of the increase in demand for LNG related products, Keppel O&M has designed a suite of products to support the gas value chain.

Gas to LNG Liquefaction Solutions

Economical, safe and quick to market, Keppel's innovative offshore and onshore liquefaction solutions address the growing needs of the LNG industry. They leverage Keppel's proprietary liquefaction technology, PreNEX, and over 35 years of experience and expertise in conversion and modularisation.

Developed by GTD, our offshore deployment concept of a Floating Liquefied Natural Gas (FLNG) vessel combined with a Floating Storage Unit (FSU), provides cost-effective solutions for gas export terminals and are faster to market compared to land-based terminals. They are suitable for deployment in a wide range of water depths of up to 3,000m with liquefaction capacity from 0.5 million tonnes/year (MTPA) to 3MTPA.

Our micro liquefaction plant is an onshore solution in a "kit-form" that can be scaled to suit customers' needs. Modularised, it is scalable from 20 tonnes per day (TPD) and is suitable for use in LNG fueling stations for road, rail and marine uses.



LNG to Gas Regasification and Storage Solutions

A flexible, safe and cost-effective solution to receive and regasify LNG, our Floating Storage and Regasification Units (FSRU) enable our customers to bring their gas to market quickly without relying on land-based terminals. They can be equipped with our proprietary Modular Regasification Units which are safe, efficient and versatile.

Our 15,000m³ LNG FSRU, equipped with two IMO Type-C LNG cargo tanks, is more economical and faster to market compared with conventional floating solutions.



LNG to Users Small Scale Transportation

With our experience as a specialised shipbuilder, Keppel has designed a range of robust carriers that can deliver LNG along shallow water rivers, coastal areas and inter-islands. Our carrier/bunker vessels have a range of up to 30,000m³ capacity and are of non-propelled or self-propelled designs to meet a wide range of LNG transportation needs.



Gas to Power Power Conversion

With increasing demand for reliable power that is mobile and can reach remote areas, Keppel has developed designs for LNG-fuelled floating power vessels and barges with enhanced efficiency that can be installed quickly and economically.

Able to provide economic power generation highly suited for base load application, Keppel's floating power plant has high maneuverability and is designed for continuous power generation with redundancy. It can also be configured with high efficiency and low emission gas turbines or reciprocating engines, allowing for a larger generation capacity in a compact footprint.

Another offering is our Floating Storage and Regasification Power Plant (FSRP), which integrates the storage and regasification units to provide efficient LNG power generation in a single economical package.



LNG as Fuel Dual-Fuel Vessels

Keppel is well-placed to provide retrofit solutions and newbuild designs for dual-fuel (diesel/LNG) propulsion systems.

MTD, together with KOMtech, has developed a 65-tonne Azimuth Stern Drive (ASD) dual-fuel diesel LNG tug design which allows tugs to carry out greener, safer and more cost-efficient operations. The innovative design received the Outstanding Maritime R&D and Technology Award at the 2015 Singapore International Maritime Awards.



1 Platform Supply Vessel

3 Specialised Vessels

5 Submersible

7 Semisubmersible Support and Maintenance Unit

9 Semisubmersible Drilling Tender (SSDT)

11 Drillship

13 Floating Production Storage and Offloading Facility (FPSO)

15 Floating Storage and Re-gasification Unit (FSRU)

17 Floating Liquefied Natural Gas Facilities (FLNG)

19 Icebreaker

2 Anchor Handling Tug/Supply Vessel (AHTS)

4 Semisubmersible Accommodation Unit (SSAU)

6 Multi-Purpose Self-Elevating Platform (MPSEP)

8 Jackup Rig

10 Semisubmersible Drilling Rig

12 Extended Tension Leg Platform (ETLP)

14 SPAR

16 Semisubmersible Floating Production Unit (FPU)

18 Ice-class Floating Storage Offloading vessel (FSO)

20 Ice-worthy Mobile Offshore Drilling Unit

1 Platform Supply Vessel
(All waters)
• Specially designed to supply offshore oil platforms
– 4500 Dwt PSV

3 Specialised Vessels
(All waters)
• Pipe Laying Vessel
• Diving Support Vessel

5 Submersible
(Shallow water <30 ft)
• Mobile unit which sits entirely on the seabed during operation

7 Semisubmersible Support and Maintenance Unit
(Deep water)
• A floating platform to support maintenance and upgrading works for FPSOs with high operation uptime
– SMART Semi

8 Jackup Rig
(Shallow water – 500 ft)
• Self-elevating mobile drilling unit that stands on its legs on the seabed during operation
– KFELS MOD VI
– KFELS A Class
– KFELS B Class
– KFELS Super A Class
– KFELS Super B Class
– KFELS C Class
– KFELS G Class
– KFELS N Class
– KFELS N Plus
– KFELS J Class
– KFELS E Class

9 Semisubmersible Drilling Tender (SSDT)
(Deep water – 6,000 ft)
• A floater that operates alongside SPARs and Tension Leg Platforms
– SSDT™ 5000NG
– SSDT™ 3600E

10 Semisubmersible Drilling Rig
(Deep water – 10,000 ft)
• A floating unit which can perform deepwater drilling operations
– DSS™ 20
– DSS™ 38
– DSS™ 38M
– DSS™ 61
– DSS™ 38E
– DSS™ 51HE
– DSS™ 60HE
– SSDU 5000

11 Drillship
(Ultra-deep water – 12,000 ft)
• Able to undertake ultra-deepwater drilling
– CAN-DO Drillship

12 Extended Tension Leg Platform (ETLP)
(Deep water – 8,000 ft)
• A vertically moored floating structure used for the production of oil or gas

13 Floating Production Storage and Offloading Facility (FPSO)
(Deep water)
• Ship-shaped facility used for the processing of oil or gas, storage and offloading of oil or condensate

14 SPAR
(Deep water – 8,000 ft)
• A large cylindrical unit which supports a rig platform, and anchors it to the seafloor using cables and chains

15 Floating Storage and Re-gasification Unit (FSRU)
(All waters)
• Able to receive LNG from a carrier, re-gasify to natural gas and send out through risers and pipelines

16 Semisubmersible Floating Production Unit (FPU)
(Deep water)
• A floating platform used to produce oil and gas in deepsea
– DeepDraft Semisubmersible

17 Floating Liquefied Natural Gas Facilities (FLNG)
(All waters)
• Able to treat and liquefy Natural Gas as well as store and transfer LNG at sea

18 Ice-class Floating Storage Offloading vessel (FSO)
(All waters)
• Ice-resistant vessel that receives crude oil from a fixed platform and offloads it to shuttle tankers

19 Icebreaker
(All waters)
• A support vessel that forges passages through icy waters

20 Ice-worthy Mobile Offshore Drilling Unit
(Shallow water – 180 ft)
• Able to operate in the harsh Arctic region
– Gemini

Technology & Innovation

(TSHDs) for the Jan De Nul Group. Incorporating Jan De Nul’s design, the TSHDs will be built to the requirements of classification society, Bureau Veritas. They will be able to dredge to a maximum depth of 27.6m and have a hopper capacity of 3,500m³.

Such compact TSHDs are used for maintenance work, coastal restoration and for a variety of land reclamation work around the world.

Floating Desalination Plant

The global desalination market is increasing as the world’s growing population requires more clean water. Floating desalination plants can be quicker and cheaper to implement compared to land-based plants. Capacity can also be incrementally added if necessary and floating plants can be easily deployed elsewhere after completing their expected roles.

To meet this need for quick access to water, Keppel has developed a floating desalination plant design that has high maneuverability, is versatile and has efficient desalination capabilities. We are able to leverage Keppel Seghers’ advanced water solutions and their track record of completing more than 350 water and wastewater treatment projects.

Fostering Future Forward Innovation

Taking into account anticipated needs and changing demands and trends of the market, we have expanded our technological expertise and identified key research areas to pursue.

Transforming Technology Mindsets

To diversify its suite of offerings in a depressed oil and gas market, KOMtech is leveraging its rich technology and

innovation research resources to develop solutions beyond the oil and gas industry.

Extensive knowledge in designing rigs and elevated platforms has opened the possibility of creating livable cities along the shore which will dramatically transform any marine and city skyline. In repurposing technology, we explore the use of jackup or floating solutions as an economical, stable and safe form of real estate instead of land reclamation. It can be used by ports to improve their facilities and help tackle sea traffic as well as offer offshore anchorage hub facilities.

Our in-depth knowledge of arctic environments and ship designs has enabled us to design luxury cruise vessels for the arctic environment which offer novel experiences for the evolving tourism market.

We are also looking at how we can contribute to the non-conventional energy market, including designing better offshore wind support facilities to help harness wind energy at sea.

In our operations, we are exploring the use of additive manufacturing, especially in 3D printing, to improve the way we build, repair or even service rigs and vessels at sea. KOMtech, alongside with Lloyd’s Register, signed a research collaboration agreement with Nanyang Technological University in May 2016 to advance research in the use of additive manufacturing technology for the offshore and marine industry.

Expanding Into Services Market

Anticipating the needs of the shallow water market, OTD works with Keppel O&M’s business units to develop new solutions.

One of the products being developed is the Supervisory Control and Data Acquisition (SCADA) & Automation System.

The new service includes Computational Fluid Dynamics which deals with cooling and heating, improving instruments and connectivity onboard rigs, and analysing rig data and aftermarket services for jackups. Being able to provide improvements to and enhancements of rig energy and drilling systems efficiency will enable Keppel O&M to become the preferred holistic one-stop solutions provider for clients.

OTD is collaborating with Sky-Futures, a leading provider of Unmanned Aerial System (also known as UAS or drone) inspection services for the oil and gas industry to offer these services to Keppel O&M’s global customer base. This partnership will change the way inspections – such as Dropped Object Surveys – can be performed on hard-to-reach areas of offshore drilling and support vessels. Clients are assured of a swift analysis and resolution after inspection.

Shaping the Future

Keppel and the National University of Singapore (NUS) formed the Keppel-NUS Corporate Laboratory in 2013 which focuses on three major research thrusts to address future challenges in the offshore spheres of Future Systems, Future Yards and Future Resources.

Future Systems

In our future forward focus, a multi-disciplinary team of experts, academics and researchers are working to address the scientific and technical challenges of floating systems operating in deep water and arctic environments.

The research collaboration agreement on Additive Manufacturing between NTU and KOMtech was signed on 17 May 2016 by Mr Aziz Merchant (extreme right), ED of KOMtech and Prof Lam Khin Yong (second from left), NTU Chief of Staff and Vice President of Research, and was witnessed by Mr S Iswaran (third from left), Minister for Trade and Industry.



For the deepwater technology partnership, research focuses on semi hull optimisation to enhance the design and construction of next-generation deepwater platforms. The results have been introduced in Keppel O&M's semi designs.

In line with Keppel's objective of becoming a leading designer and builder of arctic offshore structures, a team of researchers has been examining ice-structure interaction, which is a critical factor in the design of arctic offshore structures.

Focusing primarily on bottom-founded, gravity-based, and jackup structures, this work supports and complements the arctic efforts of KOMtech. The output of the R&D done in both deep water and arctic environments will enhance Keppel's products and increase its expertise.

Future Yards

This research thrust focuses on productivity enhancements for yard operations to improve automation and efficiency in the yards as well as the study of high-value steel work fabrication in the offshore industry. Aiding this research was the opening of the Keppel-NUS Corporate Laboratory Robotics and Automation workshop in January 2016 which houses a welding robot and other accompanying equipment.

On 3 June 2016, a gantry mounted welding robot was installed at a Keppel FELS yard. A study was done on the robot's impact on multi-pass welding, such as the reduction in man-hours, improvement in accuracy and reliability and reduction in rework.

Future Resources

Future Resources focuses on Deepsea Nodule harvesting to develop core competencies in deep-water exploration

survey techniques for the establishment of an environmental baseline.

In 2015, Ocean Mineral Singapore Pte Ltd, a JV between Keppel and Lockheed Martin's subsidiary – UK Seabed Resources Ltd (UKSRL), was granted concession for the exploration for Polymetallic nodules by the International Seabed Authority (ISA) at a site of 58,000 sq-km within the Clarion-Clipperton Zone (CCZ) of the East Pacific Ocean.

KOMtech, together with UKSRL and a team of 22 scientists and seven geoscientists from various institutions across three continents including experts from NUS, undertook a joint scientific expedition to study the geophysical and environmental conditions of the site in the CCZ. The data and samples gathered through this maiden expedition formed a baseline for the environmental impact studies and for the development of environmentally benign technologies for deep-sea mining.

Deepening Competencies Through Strategic Partnerships

Keppel O&M forms strategic alliances focused on innovation with leading industry players, government agencies and academic institutions to develop and customise market-relevant solutions.

Notable collaborations include KOMtech teaming up with Lloyd's Register Global Technology Centre in Singapore to improve the safety and performance of semi designs. Co-funded by the Maritime Port Authority of Singapore, the joint research and development project aims to develop advanced numerical simulation capabilities using high-performance computing.

KOMtech also partners classification societies such as ABS in many projects, including research on Computational Fluid Dynamics and the effects of moonpool on the drillship's resistance and motions. The results have then been implemented in Keppel O&M's drillship designs. KOMtech also collaborated with NUS for its students to undertake a design study to convert Keppel near-shore and offshore structures into different civilian applications.

OTD is partnering Forum Energy Technologies to offer the oil and gas industry the latest in hydraulic catwalk technology for offshore rigs. It offers operators a premium jackup rig, fitted with a catwalk with best-in-class cycle times for moving drill pipes and tubulars from the pipe storage area up to the drill floor.

To extend Keppel's network and support in LNG solutions, Keppel's GTD joined SEA\LNG, a non-profit collaborative industry foundation, which works to accelerate the widespread adoption of LNG as a marine fuel.

As a leader in the design and construction of ice-class vessels and services, Keppel presented a breakout session for the first time at the Arctic Circle Assembly, which took place from 7 to 9 October 2016 in Reykjavik, Iceland. The breakout session included discussions on Arctic Tourism Hub, as well as Near Shore Search and Rescue Hub concepts as part of a sustainable arctic development.

Keppel O&M also teamed up with classification society, ABS, to explore the feasibility of several major joint development projects (JDPs). The JDPs will explore solutions to support the offshore industry in the near and medium term and will include topics such as special purpose rigs, data analytics and subsea technology.



The hydraulic catwalk (pictured) installed on a KFELS B Class jackup rig offers best-in-class cycle times for moving drill pipes and tubulars from the pipe storage area up to the drill floor.

Sustainability Report

At Keppel Offshore & Marine, we are committed to conducting our operations in a sustainable and socially responsible manner which positively impacts the community, the environment, our employees and all other stakeholders.

Sustainability Framework



Sustaining Growth

The success of our business is underpinned by an unwavering focus on Health, Safety and Environment, meticulous project management as well as prudent risk management.

Through an ongoing process of optimising resources and increasing productivity, we continue to deliver innovative projects with strong value offerings and hallmark quality to create value for customers worldwide.

➔ For more information, go to: pages 48–61



Empowering Lives

People are the heart of our business. As an employer of choice, we are committed to growing and nurturing our talent pool through continuous training and development to help our people reach their full potential.

We seek to develop a formidable and results-driven workforce with strong leaders imbued with our core values to take the company into the future.

➔ For more information, go to: pages 62–67



Nurturing Communities

As a global citizen, we aim to give back to communities wherever we operate in a variety of areas spanning knowledge building and education, social development and environmental protection.

We encourage employees to contribute actively as change agents to effect improvement in their surroundings and in the lives of those around them.

➔ For more information, go to: page 68–71

Managing Sustainability

As an industry leader, we have developed guidelines to be a responsible corporate citizen in health and safety, risk management, productivity, people and community development.

Management Structure

Keppel Offshore & Marine's (Keppel O&M) sustainability issues are rigorously managed and communicated across all levels of our business units. We are guided by the Sustainability Steering Committee of our parent company, Keppel Corporation. The Steering Committee comprises senior management from across the Keppel Group and sets our sustainability strategy. Supporting the Steering Committee is the

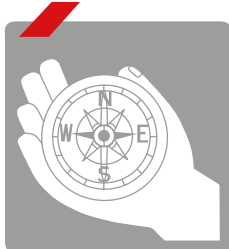
Working Committee that executes our sustainability strategy and reports on our performance.

Core Values

Our employees are guided by our core values and the Employee Code of Conduct, which address standards of acceptable and unacceptable behaviour, personal decorum and ethical business behaviour.



Can Do
Passion and Vigour



Integrity
Act with Ethics and Honesty



Customer Focus
Forge Value-Added Partnerships



People-Centredness
Value and Nurture People



Safety
Zero Accident,
Zero Loss



Agility & Innovation
Adapt to Change and Innovate for Growth



Collective Strength
Global Mindset and Teamwork



Accountability
Responsible to all Stakeholders

Safety Excellence

HSE Awards

35

awards received at the WSH Awards 2016.

Investment of

\$31m

on HSE infrastructure and training globally.

By staying resolute in our efforts to foster a safe and healthy workplace, we better protect our people, property and environment.

Sustained Efforts

Regardless of the business climate and level of activity at Keppel Offshore & Marine (Keppel O&M), the safety and well-being of our employees and subcontractors remain our top priorities. While we have been streamlining and rightsizing our operations in the face of industry headwinds, we continue to ensure that safety is not compromised.

We believe that a strong safety culture is a prerequisite for a productive workforce and sustainable business operations. Our various safety initiatives form the foundation of our Health, Safety and Environment (HSE) Management System, which drives us towards our vision of staying Incident-Free – Zero Accident, Zero Loss, No harm to People and No damage to the Environment.

In 2016, we invested approximately \$31 million in infrastructure upgrades and training our people. Our sustained investments in safety measures enable us to increase the safety competency of our workforce, improve our robust HSE system and foster a positive HSE culture across our global operations.

The cumulative efforts over the years resulted in Keppel O&M achieving a record low Accident Frequency Rate (AFR) of 0.07

per million man-hours worked in 2016, a reduction from our AFR of 0.10 in the previous year. Despite our best efforts, our Accident Severity Rate (ASR) in 2016 rose to 201 man-days lost per million man-hours worked compared to 111 in 2015.

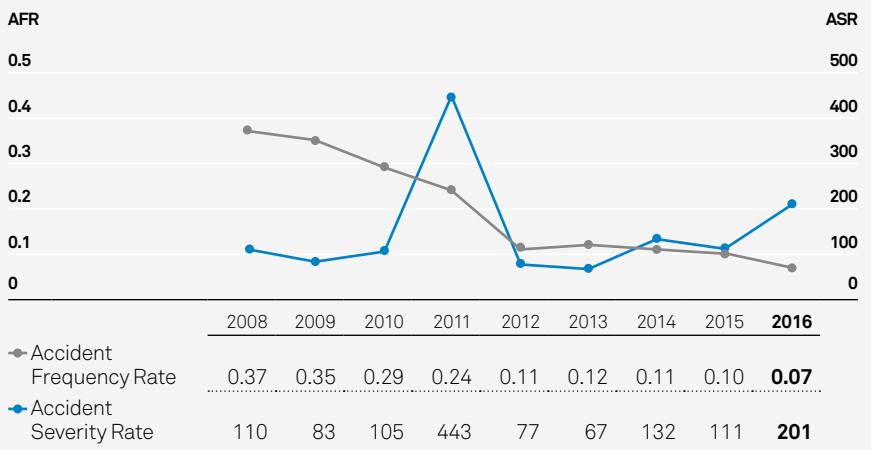
While we achieved an improvement in our AFR, we suffered four fatalities – one in Singapore and three overseas – which involved working at height, performing high pressure testing and diving works. Each incident was thoroughly investigated to determine the root cause. Specific preventive measures were developed and the lessons were shared across the Group as part of our collective efforts to continually improve safety processes. We have also taken active steps to focus on high risk activities and step up our oversight of overseas yards.

A Positive Safety Culture

By taking the lead, management directly influences the workforce and sets a positive example in the company’s drive to strengthen its safety culture. This is propagated across Keppel O&M’s global operations.

The Keppel O&M Board Safety Committee (BSC) formed in 2012 is an example of management’s commitment to strengthen safety culture across the Group. It sets

Keppel O&M Safety Statistics



strategic safety directives and focuses on tackling serious injuries and fatal incidents at the fundamental level. Relevant individual cases are reviewed at quarterly BSC meetings and key lessons are shared with all our yards.

To engage the frontline workforce and reinforce the importance of workplace safety, BSC members and senior management of Keppel Corporation and Keppel O&M conducted a joint visit to Keppel Nantong shipyard in China in May 2016 and Nakilat-Keppel Offshore & Marine (N-KOM) shipyard in Qatar in September 2016.

The Annual HSE Improvement Plan is another example of management's efforts to reinforce a positive safety culture. Top management of each yard meet to detail the different initiatives to be undertaken in order to improve HSE performance. This ensures alignment of safety standards across the yards and that various aspects of HSE receive sufficient attention.

Encouraging Safety Best Practices

Across our yards, annual safety promotion campaigns are organised to encourage best safety practices.

In 2016, the Keppel O&M Life Saving Rules were introduced to guide employees on safe work behaviours. This is an addition to the seven key High Impact Risk Activities (HIRA), which remains a focus in daily activities.

The month-long Keppel FELS HSE Excellence Promotion Campaign launched in July 2016 was themed

"Intervene! Don't look away!" and encouraged workers to stop unsafe work practices that they may come across in the yards. The "Prevention of Slip & Fall" campaign conducted by Keppel Shipyard reinforced the importance of safety vigilance in manual work. The yard also held its Heavy Vehicle Engagement Campaign in December 2016 and enhanced its Hearing Conservation Programme throughout the year. Keppel Singmarine organised a HSE Day themed "Protect Your Hands and Fingers at Work", in line with Keppel O&M's efforts to improve safety fundamentals of our workers.

In our overseas yards, Keppel Subic Shipyard in the Philippines held a week-long "Hand and Finger Injury Prevention" campaign in August 2016. In Brazil, BrasFELS' safety campaign was themed "Safety Starts with Me", while Caspian Shipyard Company in Azerbaijan focused on the prevention of falling objects. Keppel AmFELS in the United States (US) also launched the "End Safe 2016 and Start Safe 2017" campaign in December 2016 to encourage continued safety vigilance during the festive period.

Staying abreast of a constantly evolving safety environment, Keppel FELS received certification for the Singapore Standard on Occupational Safety and Health management system (SS506). This is similar to Keppel Shipyard and Keppel Singmarine's compliance to the standards. Similarly, our yards in Azerbaijan, Brazil, China, Qatar, the Netherlands, United Arab Emirates and US have also been certified to meet both OSHAS 18001 and ISO 14001 standards.

With newly built facilities such as the Keppel Wellness Gallery, we improve the health and well-being of our employees, and in turn, the overall safety at the workplace.



Regular training sessions are held for all our stakeholders, from frontline workers to subcontractors, to ensure that safety best practices are applied across our yards globally.

Safety Excellence

We are always seeking to improve safety best practices and innovation plays a crucial role in this pursuit. At the annual Keppel Group Safety Convention, Keppel O&M business units picked up two Platinum, three Gold, six Silver and seven Bronze awards out of 53 projects submitted groupwide. These innovative solutions have been developed into actual products that make work processes safer for our workers.

Proactive Engagement

The Keppel O&M Cross Business Unit Audit introduced in 2012 serves as a platform to review the efficiency and effectiveness of our core work processes and ensure that daily work processes are conducted in accordance to documented procedures. The second round of cross audits was completed over 2015 and 2016.

The Keppel O&M HSE department continuously engages global yards to ensure that safety messages, programmes and best practices are shared in a timely manner.

HSE personnel in Singapore are also regularly assigned to overseas yards such as Baku Shipyard and Keppel Subic Shipyard to guide, support and align safety standards. Mr Yong Chee Min, Director (HSE & Special Projects) was invited to conduct annual safety workshops for Keppel Nantong's management and subcontractors. Similar deployments

are also in place for our subsidiaries, Alpine Engineering and Blastech Abrasives.

In September 2016, N-KOM shipyard in Qatar opened its Safety Training Centre, which aims to improve safety by providing a better understanding of on-site challenges and initiatives. Similarly, Keppel Verolme in the Netherlands set up a Safety Training Centre to highlight the importance of the five Cs – Commitment, Competence, Cooperation, Control and Communication – in holistic safety training.

Locally, regular HSE sharing sessions are organised at our foreign workers' dormitories, and safety initiatives are regularly communicated through online HSE Alerts.

Health and Environment

Keppel O&M recognises the importance and interdependence between the work environment and the overall safety, health and well-being of our employees.

In 2016, Keppel Shipyard started operating the Wellness Support Centre, which provides holistic health and medical services, as well as counselling for workers. The Keppel Wellness Gallery, which aims to educate workers on proper nutrition, an active lifestyle and good mental wellness, was officially opened on 10 February 2017.

Keppel Shipyard also built three 4-storey rest areas to create a conducive environment for the workers to rest and have their meals, with each rest area accommodating up to 2,000 workers. The fourth rest area is currently in its planning phase.

On top of this, health and wellness initiatives, including exercise programmes, distribution of fruits and nutritious food and healthy lifestyle campaigns are made available to employees across Keppel O&M. Hearing conservation and respiratory protection initiatives are also in place to protect our people from occupational diseases.

Strong Partnership

Keppel O&M shares a close working relationship with all our stakeholders, including our employees, customers, subcontractors and suppliers, industry partners and regulatory bodies.

The Subcontractors Executive Council Safety Committee for Keppel FELS, which comprises representatives from different trade sections, meets regularly to discuss safety initiatives and share best practices. Keppel Shipyard works closely with the Workers Union through its Workforce Safety Councils, as well as with subcontractors through its Contractors' HSE Watch Groups.

The Life Saving Rules were introduced in 2016 to guide our employees on safe work behaviours.



Life Saving Rules

				
Staying Alert & Keeping Safe I stay alert and am aware of hazards around me	Risk Assessment I only start work after I know the specific job hazards and how to stay safe	Line of Fire I position myself in a safe zone, away from any Line of Fire situations	Working at Height I have full Fall Protection whenever I work at height	Hot Work When doing hot-work, I ensure the workplace is gas free and no flammable materials are around
				
Permit-to-Work For jobs that require Permit-to-Work, I ensure all controls are in place before starting work	Lifting Operations I never put myself under a suspended load	Confined Space Work I always work with a Buddy when doing Confined Space works and ensure the Confined Space is gas checked before entering	Energy Isolation Before starting work, I ensure all energy sources are fully isolated and it is safe for me and people around me	Management of Change I will stop the job and consult my Supervisor if there is any change in work plan or worksite environment

As bizSAFE Partners, Keppel FELS, Keppel Shipyard and Keppel Singmarine also actively encourage our contractors to utilise the bizSAFE framework to build their safety capabilities and competencies.

As part of efforts to improve the industry's overall safety standard, Keppel O&M partners and supports national and trade organisations such as the Ministry of Manpower (MOM), Workplace Safety and Health (WSH) Council, and Association of Singapore Marine Industries (ASMI). As a Group, Keppel regularly contributes and sponsors annual national safety events, including the WSH Conference, National WSH Campaign and bizSAFE Convention.

The management of Keppel O&M has also contributed to the industry's pursuit of safety excellence by taking on various roles in the WSH Council and ASMI. Mr Chow Yew Yuen, then-CEO of Keppel O&M, was a member of the WSH Council from 2014 to 2017. He was also the Deputy Chairman for the WSH (Marine Industries) Committee and chaired the WSH Council National Work at Heights Safety Taskforce. Mr Yong Chee Min, Director (HSE & Special Projects), is the Chairman of the ASMI WSH Committee, as well as a member of the WSH Council National Work at Heights Safety Taskforce and the WSH Council (Marine Industries) Committee. Mr Chris Ong, Acting CEO, Keppel O&M and Managing Director, Keppel FELS,

Mr Chor How Jat, Managing Director, Keppel Shipyard, and Mr Abu Bakar, Managing Director, Keppel Singmarine, are all members of the WSH Council (Marine Industries) Committee.

In addition, Keppel O&M participates regularly in seminars and forums to share safety best practices with the industry. Mr Chow Yew Yuen, then-CEO of Keppel O&M and then-President of ASMI, shared on the safety journey of Singapore's offshore and marine industry at the Singapore WSH 2016 Conference, while Mr Yong Chee Min, Director (HSE & Special Projects) hosted a delegation from Singapore Examinations and Assessment Board who wanted to learn from Keppel O&M's approach to safety innovation.

Hallmark of HSE Excellence

For upholding high safety standards, Keppel O&M clinched 35 WSH Awards at the annual event ceremony held in July 2016 – the largest number of awards won by a single organisation in Singapore. 27 of these awards were secured in the Safety and Health Award Recognition for Projects (SHARP) category.

Keppel Singmarine also bagged the WSH Innovation Award for their Mighty Hammer Arrestor initiative, an innovation which prevents the dislodging of steel hammer heads from handles during use. For their

robust WSH management systems and strong WSH performance, Keppel Singmarine clinched the WSH Performance (Silver) award for the tenth consecutive year. Kenny Foong Kum Seng, Outfitting Supervisor, Keppel FELS, was also awarded an individual WSH Award for Supervisors for improving the safety and health performance of his team.

As a testament to Keppel Nantong Shipyard's efforts in ensuring a safe working environment, the shipyard was conferred the 2015 Safety Model Construction Enterprise Award by the Jiangsu Provincial Government in 2016. The award recognises the shipyard's efforts in the development and effective implementation of an occupational health and safety management system, as well as its continuous strengthening of workplace safety training. Keppel Nantong is the first shipyard in the Gangzha district of Nantong to set up a safety-focused training centre.



Keppel FELS' 20th HSE Excellence Promotion Campaign focused on empowering everyone to intervene actively in any unsafe situation.

Productivity and Quality

Innovations

>200

ideas generated by Keppel FELS' Synergy Programme.

Global Participation

10

business units participated in the KOM Innovations Awards.

Cost Savings

>\$245,000

saved by Keppel Shipyard from its IQC initiatives.

Through continuous improvements and innovations, we increase efficiency in our operations and the quality of our products.

Keppel Offshore & Marine's (Keppel O&M) excellence in the execution of our projects and the quality of our products are the result of our continuous efforts to innovate, improve processes and raise productivity.

Business units from across the Group actively organise and participate in various productivity, quality and innovation initiatives. The Group also leverages technology to enhance infrastructure and processes in order to stay ahead of the competition.

Spurring Innovations

To foster an innovative culture in Keppel O&M, a variety of platforms are used to recognise and showcase ideas that are impactful for the Group.

Keppel O&M holds an annual innovation competition known as the KOM Innovation Awards. The 2016 edition saw 41 submissions from 10 business units, of which four received Gold awards.

One of the winning projects from Keppel FELS is entitled "Piping Automation Chronicle: Smart Construction Drawing". The project tracks target performance indicators, enabling an efficient measurement of job performances so that further improvements can be made.

The Keppel-NUS Corporate Laboratory, which was set up in collaboration with the National Research Foundation (NRF), opened a robotics and automation workshop to look into productivity enhancement of yard operations.

Quality, productivity and innovation competitions are also held at the business unit level. Keppel Shipyard received 20 submissions for its Innovation Quality Circle (IQC) event. Of these submissions, seven were shortlisted and presented before judges from the Singapore Productivity Association at the IQC Convention. Four of the submissions received Gold



Mr Chris Ong (third from left), MD of Keppel FELS, presenting an award to one of the winning teams at the annual IQC ceremony.

Awards, while three received Silver Awards. Through its IQC projects, Keppel Shipyard saved more than \$245,000.

Meanwhile, Keppel FELS' IQC 2016 campaign themed "Get SMART through innovation" focused on leveraging technology to achieve higher performance and a more conducive work environment. 27 innovative ideas were submitted. Another six projects were presented before judges from the Singapore Productivity Association, with one submission receiving the Star Award, while the other projects bagged the Gold Award.

A team from Keppel FELS' commissioning department developed a method to optimise fuel efficiency on diesel generators in operation, whereby an automated system is used for power request and usage. Another 'Smart' project by the piping department is the modification on welding electrode quivers to improve energy consumption, thereby generating significant cost savings.

Another initiative by Keppel FELS is the Synergy programme, which is a platform that encourages employees from different functions and levels to

come together to identify day-to-day work challenges and formulate ideas to improve processes. This programme has generated more than 200 ideas and saved close to 250,000 man-hours since it was introduced.

At Keppel Singmarine, innovation ideas are recognised and shared at an annual platform called Continuous Improvement Team (CIT).

In Brazil, BrasFELS employees are encouraged to participate in the annual INOVE competition. The competition encourages innovative, ground-up ideas that increase productivity, enhance safety or reduce costs. In 2016, the top prize went to a team from the Scaffolding Department for their device which secures scaffold planks. In April 2016, BrasFELS initiated its Synergy Programme using a starter kit from Keppel FELS Singapore.

As part of its efforts to reinforce a culture of innovation, Keppel Shipyard held an Innovation Week Roadshow from 28 November to 2 December 2016. At this roadshow, the business unit showcased projects from its Safety Innovation Team (SIT) and IQC events, as well as ideas and technologies from other Keppel business units and

The 2016 KOM Innovation Awards saw 41 submissions from 10 business units, of which four received Gold awards.



Keppel FELS installed a gantry-mounted robotic welding system on the panel production line, which has improved accuracy of welding and reduced man-hours.

Productivity and Quality

external institutions such as Ngee Ann Polytechnic.

Keppel Shipyard also launched a quarterly publication on the innovation efforts of its employees involving its facilities and operations.

Optimising Operations

In 2016, Keppel O&M continued to enhance its infrastructure, equipment, processes and systems to sustain high-performance work environments. In Brazil, BrasFELS extended its gantry crane tracks from about 160 metres to 230 metres, giving the facility greater operational flexibility. The extension works are slated for completion in the second quarter of 2017.

In 2016, Keppel Singmarine was able to achieve considerable cost and time savings by fully optimising the use of its lifting facilities. This was achieved through a combination of advanced project planning and tighter coordination of equipment delivering schedules.

Meanwhile, the Computer Aided Design and Computer Aided

Manufacturing teams from Keppel Singmarine's Engineering Department continued to work on increasing productivity for hanger and support tasks by using the SM3D software to model supports for piping, tray and HVAC ducts. With this, the Production teams can mount the supports more efficiently.

Keppel Shipyard modified the design of ventilation blowers and saved some 14,400kWh of energy per year. This resulted in estimated cost savings of \$2,592 per unit each year. Space is also better utilised due to the new blowers' stackable design. There are about 300 blowers of different sizes deployed in confined spaces across the yard.

Over at Keppel FELS, several programmes and systems were implemented to optimise operations. Besides developing a cable supply management system and a tracking programme for engineering projects, the yard also improved hull ventilation air-conditioning (HVAC) design capabilities.



Keppel Shipyard modified the design of ventilation blowers and saved some 14,400kWh of energy per year.

In 2016, Keppel FELS also installed a robotic system to improve work productivity on steel plates, which has resulted in improved accuracy and reduced man-hours.

Another process innovation by Keppel FELS is bringing forward pre-cut penetrations to an earlier phase of construction to improve on-site work efficiency. Penetrations are the openings in a plate, wall, or floor that mechanical, electrical or structural items pass through. The implemented solution reduced the total number of man-hours spent on this cutting process.

Ensuring Quality Standards

Keppel O&M's business units seek to ensure high quality standards in all aspects of their operations by undergoing assessments which certify its efficiency and quality.

Keppel FELS and Keppel Shipyard have undergone business excellence assessments by SPRING Singapore. Both organisations have successfully renewed their certifications with

Singapore Quality Class STAR, which recognises organisations that have made further improvements in their business excellence journey.

The two companies also received the People Developer certification for their holistic approach in attracting, managing and engaging employees. Both companies also received the Singapore Innovation Class, a niche standard awarded to organisations with outstanding innovation and value-creation capabilities.

Keppel FELS was also certified to European Standards EN 1090-1 and EN 1090-2, which regulate the construction of steel and aluminium structures.

In addition, a number of Keppel O&M's shipyards have attained the ISO 9001: 2015 certification for their quality management systems. This further validates their ability to consistently provide products and services that meet customer, statutory and regulator requirements.

Keppel O&M continued to enhance its infrastructure, equipment, processes and systems to sustain high-performance work environments.



Innovation programmes are conducted across Keppel O&M's global yards. Team Inovação Andaime (pictured) from BrasFELS won the INOVE Programme Star Award.

Environmental Performance

Carbon Footprint Reduction

710 tonnes

of CO₂ reduced by Keppel FELS.

Cost Savings

\$216,000

saved in annual electricity consumption by Keppel Shipyard with its new carbon initiatives.

Electricity Savings

>2,000 kWh

of electricity is saved annually from new welding processes and auto cut-off for idling devices in Keppel Singmarine.

Being eco-conscious not only protects the environment but also supports sustainable operations. Through energy-efficient practices, we manage our ecological impact and ensure cost savings.

Keppel Offshore & Marine (Keppel O&M) ensures that environmentally responsible practices are an integral part of our business. They help to reduce our carbon footprint and provide cost savings. The Group is committed to full compliance with all environmental rules, regulations and standards applicable to its operations.

Energy Efficiency

Keppel O&M places a strong emphasis on energy efficiency and is constantly working on ways to improve its performance in this area.

Through new energy-saving projects, Keppel FELS managed to further reduce its carbon footprint by about 710 tonnes of CO₂ in 2016. Measures taken include switching from the use of diesel generators to power supply cables to provide electricity, switching from Liquefied Petroleum Gas (LPG) to Compressed Natural Gas (CNG) as a fuel source and replacing diesel generators with static frequency converters for vessel power requirements.

During the year, Keppel Shipyard achieved approximately \$216,000 in annual electricity cost savings through its new energy reduction initiatives. Energy-efficient ventilation blowers were installed to replace outdated models and variable speed drives were installed on ballast pumps, generating significant energy savings. An estimated 464,400 kWh is saved annually from these two projects.

In recognition of its efforts in conserving energy, Keppel Shipyard received the Energy Efficiency National Partnership award for Best Practices (Honourable Mention) from the National Environment Agency of Singapore on 4 October 2016.

Through innovations in processes, Keppel Singmarine is able to better manage its energy consumption. For example, the reduced usage of a fleet of forklifts led to a drop of approximately 115 tonnes of CO₂ annually. The yard also reaped energy savings in its welding processes and introduced the use of auto cut-off for idling devices. More than



Employees from Keppel Subic Shipyard planted a total of 100 seedlings in support of an Earth Day campaign.

2,000 kWh of electricity is expected to be saved annually from these initiatives.

The Keppel O&M Energy Programme Office aims to synergise energy-saving initiatives across all its shipyards and is constantly seeking opportunities for carbon emission reductions. New initiatives have been planned for subsequent years, including installing solar panels across more offices to harness renewable energy.

Water Savings

In line with Singapore's water usage programme, Keppel O&M seeks to use NEWater (treated wastewater from sewage) where possible, to reduce the usage of potable water. Other water saving initiatives include installing water-efficient equipment and devices, encouraging good water usage habits as well as improving leakage inspection and response times.

At Keppel FELS, scrap materials from the yard are reused to build drains and pipes that channel rainwater from rooftop gutters and drains to a tank for gas hose testing.

Recycling

Shipyards across Keppel O&M embrace recycling for environmental and cost benefits.

At Keppel Shipyard, waste generated are properly segregated. Bins catering to different waste types are conveniently located around the shipyard, from office buildings to workshops. Certain recyclable

materials like scrap metal, worn out safety goggles and face shields as well as used paper are collected and sent to recycling companies. Other recyclable materials with resale value, such as cables, non-ferrous scraps and waste electrode butts, are collected and sold.

Managing Emissions

In line with the Keppel Group, Keppel O&M is committed to improving the Group's carbon footprint and achieve a 16% improvement in its greenhouse gas (GHG) intensity from 2020 business-as-usual (BAU) levels.

Stakeholder Engagement

The Group seeks to build an energy-conscious culture across all levels of the workforce. Employees are encouraged to take active steps to conserve energy in their daily routine. Energy or water-saving tips are regularly shared with employees. In addition, campaigns are held regularly to inculcate good practices.

The Group also encourages employees to lend their support to global environmental movements and rally the public to do the same. On 22 April 2016, 100 employees from Keppel Subic Shipyard marked Earth Day by planting seedlings in the shipyard's vicinity. The initiative is part of a global campaign spearheaded by Earth Day Network, a non-profit organisation which aims to plant 7.8 billion trees by 2020.

In Brazil, BrasFELS organised an environment workshop for students from

the Cornelis Verolme Municipal School on 20 October 2016 in celebration of the country's National Tree Day. The workshop also gave students the opportunity to sow seeds, fostering a green mindset.

In addition, Keppel O&M participates regularly in coastal cleanup events. 14 BrasFELS volunteers participated in a public beach cleanup event held at Amendoeiras beach, Gipoia Island on 17 September 2016. The event was held in conjunction with the World Annual Coastal Cleanup Day.

In Singapore, 30 volunteers from Keppel FELS participated in a beach cleanup at Pasir Ris Beach on 1 December 2016, during which they removed trash from the coastline.

As part of Keppel's efforts to build an energy-conscious culture, all employees are encouraged to take active steps to conserve energy in their daily routines.



Mr Boo Chin Tuan (right), GM, Operations Excellence, Keppel Shipyard, receiving the Energy Efficiency National Partnership award for Best Practices (Honourable Mention) from Mr Masagos Zulkifli (left), Minister for the Environment and Water Resources, Singapore.

Risk Management

Our proactive risk management system enables us to conduct our business in a sustainable manner and navigate through challenging market conditions.

Proactive Risk Management System

Keppel Offshore & Marine's (Keppel O&M) holistic and systematic Enterprise Risk Management (ERM) framework ensures proactive identification, analysis and management of risks. The system is an integral part of Keppel O&M's strategic, operational and financial decision-making processes and facilitates a risk-based response that effectively tackles market challenges in the offshore and marine industry.

The Board of Directors, assisted by the Audit and Risk Committee (ARC), has oversight of the ERM implementation at Keppel O&M. The Management team discusses Keppel O&M's key risks, significant project issues and mitigating actions with the ARC every quarter. Underpinning the Keppel O&M ERM framework are three risk tolerance guiding principles, adopted from Keppel Corporation:

- Risk taken should be carefully evaluated, commensurate with rewards and in line with the company's core strengths and strategic objectives
- No risk arising from a single area of operation, investment or undertaking should be so huge as to endanger the company
- The Group does not condone safety breaches or lapses, non-compliance with laws and regulations, as well as illegal acts such as fraud, bribery and corruption.

Keppel O&M adopts a five-step process from risk identification, assessment, mitigation, implementation and communication, to risk monitoring and review in our day-to-day operations and discussions.

Robust Review Process in Developing Business Solutions

Against the backdrop of subdued oil prices and weak macroeconomic conditions, Keppel O&M monitors the key risks of rising competition, soft market demand and counterparty risks. A regular review of risks across the company is incorporated in strategy discussions to ensure that key risks and mitigating actions are considered while evaluating potential business solutions.

With a well-established system in place, Keppel O&M is able to seize opportunities in a quick yet considered manner. All investment proposals include an assessment of key risk factors such as alignment with strategic objectives, operational controls, financial viability, potential contingent liabilities, specific country laws and regulations, technical competency and available resources.

Requests by customers to extend rig deliveries are carefully considered so that such requests are addressed in a disciplined and optimal manner.

Active Management of Project Risks

A standard risk assessment and monitoring process has been implemented to support the management and reporting of key project risks throughout a project's life cycle. Projects are only accepted after careful evaluation of potential risks in contractual commitment, schedule, cost, engineering responsibilities, compliance and where appropriate, implementation of mitigating actions to address the potential risks.

Project teams use risk and performance indicators as early warning signs for project execution risks. They are established to ensure that projects are delivered on time, within budget, safely and in accordance with the quality standards and specifications defined in the contracts with our customers.

For our overseas projects, we constantly review changes in the operating environment, political and regulatory developments, and where required, implement precautionary measures to mitigate our exposure in different scenarios. The Keppel O&M Risk and Compliance team reviews emerging risks with project teams and highlights potential issues to Management and the ARC. Lessons learnt in challenging projects are shared and discussed across the different Keppel O&M business units.

Keppel Offshore & Marine's Five-Step Risk Management Process



Fostering a Strong Culture

Keppel O&M's management is committed to fostering a strong risk-centric culture. Key messages to encourage prudent risk-taking in decision-making and business processes are reiterated in major meetings, speeches and publications. Risk management practices are embedded in daily business operations and activities to enable early risk detection and formulate prompt mitigating actions. There is a high level of emphasis on continuous education and communication to heighten risk awareness and build risk competencies for all levels across the organisation. In addition, risk management is incorporated in the annual performance evaluation process for key managers and staff.

Enhancing Operational Readiness

Business Continuity Management (BCM) is part of Keppel O&M's ERM initiatives in addressing and managing potential threats, including minimising the impact of a crisis on stakeholders, business operations and assets. Each business unit has specific task forces to manage disruptive events such as epidemic outbreaks, natural calamities, security threats and damage to critical facilities, including loss of critical

support infrastructure and key personnel. On a half-yearly basis, the BCM Steering Committee reviews the potential threats and status of implementation of the BCM programme in its key business units in Singapore and overseas.

In 2016, Keppel O&M's Singapore and overseas yards conducted various drills and tabletop exercises to test their respective business continuity plans including preparation, response and recovery procedures under hypothetical scenarios such as the emergence of pandemic flu, typhoon, fire and failure of critical IT applications and operating systems.

In addition, Singapore yards also participated in the annual International Ship and Port Security tabletop exercise with the relevant authorities, including the Singapore Civil Defence Force and Singapore Police Force, to enhance their preparedness in managing security incidents involving unauthorised entry and sabotage of yard facilities. Security checks at access control points and patrols at shorelines and perimeter fencing were also tightened across all yards in Singapore and overseas.

With a well-established risk management system in place, Keppel O&M is able to seize opportunities in a quick yet considered manner.



Keppel's emergency response readiness was put to the test during a BCM exercise in collaboration with the Singapore Police Force and Singapore Civil Defence Force.

Regulatory Compliance

Keppel has a strict code of conduct in complying with applicable laws and regulations wherever we operate.

Compliance as a Core Business Principle

With a geographic footprint spanning many countries, Keppel Offshore & Marine (Keppel O&M) closely monitors relevant legal and regulatory developments around the world. All employees are required to observe applicable laws and regulations as well as act in accordance with the Keppel Group's core values and principles wherever we operate.

The foundation of Keppel O&M's reputation and success is its commitment to do business the right way. The company has built the trust of all our stakeholders by establishing a reputation for conducting business fairly, impartially and with integrity. Keppel O&M places significant emphasis on ensuring ethical and proper actions and has a zero-tolerance stance towards any form of illegal activity, including bribery and corruption involving its employees or associates.

Regulatory Framework

Keppel O&M has a defined regulatory

compliance framework and continues to work towards strengthening our policies and processes to foster an effective compliance culture. The framework deals with the structure, people, policies and activities required for management to identify, assess, mitigate and monitor key compliance risks.

Governance Structure

The Keppel O&M Audit and Risk Committee ("ARC") supports the Board in its oversight of compliance controls. The Risk and Compliance team supports the ARC by identifying, monitoring and reporting key compliance risks as well as the required mitigating actions to ARC.

The Regulatory Compliance Governance Structure comprises the Regulatory Compliance Management Committee (RCMC) and the Regulatory Compliance Working Team (RCWT). The former is chaired by the CEO of Keppel O&M. Its members include the senior management of all key business divisions. The RCMC directs and

supports the development of overarching compliance policies, guidelines and procedures for the Group. It is supported by the RCWT which is chaired by the CFO of Keppel O&M and comprises key representatives from the Legal, Risk and Compliance, Human Resources, Corporate Development and Finance teams of all key business divisions.

The RCWT is responsible for driving the implementation of the Keppel Group's code of conduct and regulatory compliance programmes. In addition, it helps to ensure that appropriate assessments for regulatory compliance risks are conducted and suitable control measures are implemented to manage all risks.

The Risk and Compliance and Legal Departments are tasked to administer the compliance function and agenda as well as implement the compliance programme approved by the RCMC. These include core activities such as providing guidance and advice on compliance matters, as well as



Besides attending Group-wide compliance training programmes, employees are also expected to complete mandatory e-learning.

implementing risk assessment, control and reporting processes.

Tone at the Top

The CEO of Keppel Corporation and Chairman of Keppel O&M has consistently emphasised the need for regulatory compliance. Across the Keppel Group, compliance messages have been cascaded to all employees through various initiatives.

Keppel Group also sponsors and supports various compliance-related initiatives. At forums and meeting platforms held at the Group level, we actively raise awareness and build competency in regulatory compliance.

Policies and Procedures

The Keppel Group has a strict code of conduct which all employees are required to acknowledge and comply with. The code sets out principles to guide employees in carrying out their duties and responsibilities to the highest standards of personal and corporate integrity when dealing with colleagues, customers and suppliers. It covers issues relating to employee conduct and business conduct, including anti-corruption and conflict of interest. Policies are reviewed regularly and updated to reflect changes where required.

Keppel requires its business partners and associates, including individuals or entities that provide services or engage in business activities on behalf of the business unit, to apply comparable regulatory compliance standards. We require our suppliers to observe our Supplier Code of Conduct, which includes compliance with all applicable laws, human rights, safety and health, environmental management and, in particular, the prohibition of corrupt activities.

Training

Training is a key component within our regulatory compliance framework and we continue to refine our training programme and curriculum for both new and existing employees. Training programmes are tailored to the audience and we leverage the Keppel Group's forums to reiterate key compliance messages. Employees are also required to complete mandatory annual online training as well as assessments and declarations relating to the understanding of the Group's policies on code of conduct, personal data protection, competition, insider trading, whistle blowing and conflict of interest.

Training is a key component within our regulatory compliance framework and we continue to refine our training programmes and curriculum for both new and existing employees.



As part of Keppel O&M's continuous efforts to foster a compliance-centric culture, regulatory compliance training sessions are carried out across the Group, in Singapore and overseas.

People Development

Training and Development

\$12.4m

invested in the learning and development of our global workforce.

Personal Growth

21hrs

of training undergone by each employee on average in a year.

Commitment to Excellence

287 courses

conducted by Keppel O&M Group Training Centre in 2016.

An employer of choice, we are committed to nurturing our workforce to their fullest potential through holistic development programmes.

At Keppel Offshore & Marine (Keppel O&M), people are the most important asset. We believe in creating a nurturing environment to help our people develop critical skills through comprehensive and structured programmes so that they remain productive in today's challenging climate.

Continued investment in our people remains a key priority for us despite the industry slowdown. In 2016, Keppel O&M invested approximately \$12.4 million in the learning and development of our global workforce of about 20,000, with each employee averaging 21 learning hours.

Training Framework

Talent development and succession planning are crucial in achieving sustainable operations globally. Keppel O&M adopts a structured and systematic approach in our human capital development to train and groom Keppelites worldwide so that they are ready to take on more responsibilities.

The Structured Development Plan (SDP) implemented in 2015 across all business units and departments provides a learning roadmap for employees of all levels within a competency matrix that is designed to chart their career paths. This is reviewed annually to ensure that the strategic

Talent Development Framework



direction and business objectives are incorporated in the learning plan. Keppel O&M Group Training Centre is recognised as an Accredited Training Provider, Approved Training Organisation and Approved Training Centre by Singapore's Ministry of Manpower, Workforce Singapore and the Institute of Technical Education (ITE) respectively. 150 internal Subject Matter Experts (SMEs) developed and delivered an extensive list of in-house courses customised to suit our business needs. A total of 287 courses were conducted, 15 of which were newly developed in 2016. Additionally, collaborations with institutions and industry partners to develop training curriculum help provide external insights which further enriches our workforce.

In 2016, Keppel O&M initiated a multi-skilling programme to enhance the technical skillset capabilities of our workforce. This programme, which stretches across several months, serves to cross-train our people and equip them with multiple skills so that they can be deployed across the different production trades. Since its inception, 113 employees have benefitted from the programme.

Our learning pedagogy is constantly refreshed to cater to the multi-generational workforce. Most of the

courses incorporate elements which extend beyond the conventional classroom, including on-the-job training, experiential learning and e-learning.

To cultivate a global mindset and nurture well-rounded Keppelites, opportunities are offered through local and overseas job rotations. As of December 2016, we have about 150 employees from Singapore on secondment to various overseas operations.

Collaborative Learning

With changing market demands, it is crucial not only to adapt our business strategies, but also leverage existing talent to improve current processes and increase the competencies of our global workforce. Through workshops, events and programmes, Keppelites collaborate and learn from each other.

The Synergy Programme introduced by Keppel FELS in 2014 is one such example of collaboration which drives innovation and productivity. In this initiative, employees from different departments in Keppel FELS participate in workshops and share day-to-day work challenges so that they can devise effective solutions together. To date, 111 Keppelites have participated in the Synergy workshops. Its success at Keppel FELS has since inspired BrasFELS to kickstart Synergy programmes of their own.

Our emphasis on collaborative learning allows us to tap our existing talent pool and transfer knowledge across our global yards in a structured and sustainable way.



Senior management with Keppelites who received gold awards at the fourth Keppel O&M Innovation Awards.

People Development

To ensure global training excellence, the Keppel O&M Group Training Centre actively collaborates with overseas yards such as Keppel Nantong and Baku Shipyard to conduct critical skills training courses. This equips our overseas operations with the capability and flexibility to train the local workforce in a timely manner. In turn, this supports the Group in the rapid reskilling of global employees to suit our business needs.

This collaborative learning spirit culminates in the annual Keppel O&M Innovation Awards, which recognises teams of Keppelites who have brainstormed new and impactful solutions to improve processes and efficiency. The fourth edition held in 2016 saw a total participation of 41 teams across 10 business units in Keppel O&M, a 25% increase over last year.

We adopt a meritocratic approach in developing our talent and this forms the core of our human capital strategy, which is to attract, engage, recognise and develop our people.

Attracting Talent

Despite the industry downturn, it is critical to maintain a strong pipeline of talent. To this end, we have sustained our engagement efforts by participating actively in numerous recruitment drives, career fairs, road shows and industry-wide educational programmes in 2016.

As part of our outreach efforts, we hosted yard visits to generate interest and provide insights into the offshore and marine industry. We also worked alongside universities, polytechnics, technical institutions and industry partners to offer scholarships to groom budding students with good academic records, proven leadership qualities and long-term career ambitions in the industry.

To enhance the skills and career development of students in the offshore and marine engineering sector, Keppel O&M signed a Memorandum of Understanding (MOU) with ITE, Ngee Ann Polytechnic and Singapore Polytechnic. With this MOU, students and fresh graduates keen on joining the industry can leverage more opportunities through initiatives, such as the SkillsFuture Earn and Learn Programme and the Enhanced Internship Programme.

Providing Meritocratic Opportunities

Keppel O&M adopts a meritocratic approach in developing our talent and believes in providing opportunities for employees across all levels to upgrade

themselves. This forms the core of our human capital strategy, which is to attract, engage, recognise and develop our people.

Numerous structured development schemes provide tailored training for new hires of varying educational backgrounds including ITE graduates, diploma holders and university graduates.

The established Management Traineeship scheme accredited by the Institute of Marine Engineering, Science and Technology is a two-year intensive development programme that provides comprehensive training for fresh graduates with either diploma or degree qualifications. It is designed for holistic exposure to the wide spectrum of our businesses and operations and comprises classroom-based learning, workshop skills training, cross department attachments, on-the-job training, mentorship programmes and networking sessions with senior management. Since its inception in 1986, more than 1,700 Management Trainees have benefitted from the scheme, sustaining a pipeline of young talent who will progress to management positions within Keppel.

The Assistant Technical Associate and Technical Associate schemes are catered for trainees with GCE 'N' Level, GCE 'O' Level and ITE qualifications. Offered in collaboration with ITE, the

Keppel O&M participated in the MaritimeONE career showcase exhibition to share with youths and the general public on the various maritime careers available in the industry.



extensive two-year work-and-study programme includes classroom learning, practical skills training, on-the-job training and soft skills training to equip trainees with both theoretical knowledge and relevant job skills. To date, Keppel O&M is the only organisation in Singapore to be accredited to conduct an in-house Higher National ITE Certificate (NITEC) in Marine & Offshore Technology programme.

Recognising the importance of lifelong learning, Keppel O&M introduced the Employee Development scheme which awards sponsorships to eligible Keppelites keen on furthering their studies. A congratulatory ceremony was held on 12 October 2016 for 44 Keppelites who completed their studies and earned qualifications ranging from NITEC to Master's degree under various schemes offered by the company.

Fostering Conductive Learning

A motivated and empowered workforce drives a company to sustainable growth, higher productivity and increased organisational performance. Recognising this, Keppel has implemented a comprehensive suite of programmes aimed at empowering Keppelites and developing their potential.

A partnership between Keppel O&M and Singapore University of Technology & Design (SUTD), the Keppel O&M Technology and Engineering Development (KTED) programme introduced in 2015 is designed to deepen participants' industry knowledge by providing learning opportunities with industry leaders, researchers and academics from renowned institutions such as Massachusetts Institute of Technology. During the course, participants collaborate within multi-disciplinary teams to transform their innovative ideas into value-added solutions for Keppel O&M. After nine months of intensive studying and learning, the pioneer batch of participants graduated at a ceremony held at SUTD on 13 August 2016.

We continue to run the Leadership Excellence Programme which was first launched in 2011 to equip our newly-promoted managers with the necessary leadership and management skills to excel in their roles. In 2016, a final project component was introduced to the programme to reinforce the takeaways relevant to their daily work. This includes collaborative skills, tackling complex problems, sharing diverse perspectives and pooling knowledge.

Nurturing Talent Globally

Keppel O&M actively engages employees from across global yards to encourage them to upskill and reach their full potential.

On 1 June 2016, 35 engineers graduated from the BrasFELS Trainee Engineering Programme and joined the business unit's pool of skilled workforce. The two-year programme prepared the graduates by training them to understand a comprehensive range of services and products.

45 Keppelites from the inaugural Keppel O&M Technology and Engineering Development (KTED) Programme, a partnership between Keppel O&M and SUTD, graduated on 13 August 2016 after nine months of intensive studying and learning.

On 22 September 2016, four engineers from Keppel AmFELS' inaugural Operational Leadership Training Programme received their graduation plaques. The two-year programme enabled selected graduate engineers from universities in Brownsville, Texas, to learn from experienced tradesmen and production personnel by participating in construction and repair work.

Keppel O&M also held a graduation ceremony on 12 October 2016 for 12 Keppelites who had completed their NITEC and Higher NITEC education under Keppel's Technical Associate and Assistant Technical Associate schemes.

In addition, 32 other employees attained their NITECs, Bachelor's Degrees and Master's Degrees under the company's Employee Development and Scholarship schemes, a further endorsement of Keppel O&M's commitment to lifelong learning and providing employees with opportunities to upgrade their skills.



Keppelites graduated from their courses, with some earning special awards for their outstanding academic performance and co-curricular activity involvement.

People Development

Leading a healthy lifestyle not only adds value to the overall productivity of the business, but more importantly it benefits the overall well-being of our employees.

Keppel O&M also organised 15 Learn & Lunch and KOMtech Knowledge Sharing sessions in 2016. Speakers from institutions, such as University of Manchester, Norwegian University of Science and Technology (NTNU), as well as organisations and government bodies, such as Rolls-Royce and Singapore's Corrupt Practices Investigation Bureau (CPIB), were invited to share their knowledge and experience with Keppelites.

Championing Workplace Wellness

Keppel O&M firmly believes that leading a healthy lifestyle not only adds value to the overall productivity of the business, but also benefits the overall well-being of our employees.

Our Workplace Health Programmes (WHP) committee organised various programmes and initiatives in 2016 to promote different aspects of healthy living.

In Singapore, our yards continued to organise health talks on topics such as stress management, eye and foot care. To promote healthy eating habits, fruit bentos were distributed to employees and fruit bazaars were organised.

The first Workers Challenge organised by Keppel FELS in 2016 saw more than 150 Keppelites participate in events such as 100m sprint, 3km run and Masala Bhangra exercise conducted by instructors from ActiveSG.

In China, Keppel Nantong Shipyard and Keppel Nantong Heavy Industry conducted monthly blood pressure tests for employees to help monitor and control their blood pressure. In Qatar, 1,500 employees from Nakilat-Keppel O&M (N-KOM) participated in their fifth Annual National Sports Day. In the Philippines, Keppel Batangas conducted regular health talks, health screenings, complimentary dental consultations, eye checks and on-site vaccinations for all employees.

Partnering Unions

Keppel O&M actively engages its unions to maintain productive partnerships and a motivated workforce. To maintain good relations with the unions, luncheons and dialogue sessions are organised regularly to discuss a broad range of topics concerning the welfare

of our employees, including living environment, quality of food served in the yards' canteens and transportation.

In January 2016, Keppel FELS Employees Union (KFEU) introduced their new advisor, Mr Ong Ye Kung, then-Acting Minister for Education and Senior Minister of State for the Ministry of Defence, during a welcome dinner.

Delegates from the National Trades Union Congress (NTUC) visited Keppel FELS in April 2016 for a dialogue session with Keppel FELS management and KFEU.

In June 2016, the management of Keppel O&M hosted an engagement session with employees from KFEU, providing employees a platform for constructive feedback.

To overcome the challenges in the industry, Keppel O&M has taken necessary steps to streamline its operations as well as pursue opportunities in adjacent markets. In September 2016, Mr Chan Chun Sing, Minister in the Prime Minister's Office and Secretary-General of NTUC, visited Keppel O&M to meet with Keppel management, KFEU, Keppel Employees Union (KEU) and

Keppel FELS' Workers Challenge held in July 2016 saw active participation from over 150 Keppelites.



Shipbuilding & Marine Engineering Employees' Union (SMEEU) to gain a deeper understanding of these measures and explore ways where the government can provide support.

For their contributions towards the Labour Movement, Keppel SMIT Towage was awarded the Plaque of Commendation at the annual May Day Awards dinner organised by the NTUC in April 2016.

Integrating a Multinational Workforce

Keppel O&M is committed to looking after the well-being of our foreign workers in Singapore. In addition to providing highly subsidised dormitories, we constantly look for ways to improve the amenities which currently include canteens, minimarts, barber shops and wet markets. The dormitories are also equipped with recreational facilities such as multi-purpose halls, gymnasiums, basketball courts and computer rooms.

Various activities are organised regularly at the dormitories to promote harmonious living and bonding among foreign workers. These include sports competitions, bazaars and road shows.

In staying vigilant against flu pandemics in the dormitories, the Keppel O&M Pandemic Flu Task Force began testing

response procedures in 2016, starting with Keppel Housing. Tight controls and active response systems are in place, in case of any outbreak of infectious diseases at any of our dormitories.

To help new foreign workers adapt to Singapore and to attend to their mental and emotional well-being, Keppel Housing provides counselling services which includes a 24-hour emergency helpline manned by trained counsellors.

Our management, union leaders and human resources representatives also regularly visit various dormitories to engage and gather feedback from the workers in order to improve their living conditions.

Sustainable Workforce

Faced with a challenging external environment, Keppel O&M has been taking the necessary steps to ensure that operations are sustainable by reducing our direct staff strength and subcontract workforce in Singapore and overseas in line with our operational requirements.

Where possible, we continue to explore redeploying manpower to other business units within Keppel where additional business support and resources are required.

Training Excellence

Keppel O&M Group Training Centre conducted a total of 287 courses in 2016, including 15 newly developed programmes, such as the Instructional Skills course, which covers areas such as effective facilitation and delivery of lessons, thereby enhancing the instructional effectiveness of trainers.

One of the newly introduced courses, the Business Continuity Management course, provides an overview of the framework adopted in Keppel O&M, and imparts the necessary knowledge and skills required to maintain an organisational-level business continuity plan.

Other new courses include the Autodesk AutoCAD Level 1 course for beginners, which imparts techniques needed to produce high-quality two-dimensional drawings using the AutoCAD software, and the Enterprise Risk Management (ERM) course, which introduces how the company addresses risks while pursuing business objectives.

Committed to training excellence, the Keppel O&M Group Training Centre is recognised as an Accredited Training Provider, Approved Training Organisation and Approved Training Centre by Singapore's Ministry of Manpower, Workforce Singapore and the Institute of Technical Education respectively.



Mr Chan Chun Sing (in orange), Minister in the Prime Minister's Office and Secretary-General of NTUC, was briefed on operations in the yard by the senior management of Keppel O&M.

Community Development

Volunteering Hours

>4200

hours contributed by Keppel O&M employees in 2016.

Internships Awarded

174

internships awarded to students from both Singapore and overseas educational institutions in 2016.

As a responsible corporate citizen, Keppel Offshore & Marine actively contributes to the communities we operate in to nurture a sustainable future together.

Guided by our key thrusts of Sustaining Growth, Empowering Lives and Nurturing Communities, Keppel Offshore & Marine (Keppel O&M) is committed to improving the economic and social well-being of its stakeholders worldwide. We believe in giving back to communities where we operate in because as they thrive, we thrive. In 2016, we actively supported and seeded causes spanning social development, environmental protection, knowledge building and education.

Contributing to the Community

To give back to society, Keppel O&M provides different platforms for employees to participate in various volunteering activities. Besides nurturing the community, employees also foster collaborative relationships with one another and strengthen bonds.

Keppel's spirit of volunteerism extends to its 20 yards and offices worldwide. In June 2016, Keppel FELS formed a Corporate Social Responsibility (CSR) committee dedicated to organising outreach events and volunteering activities to meet the needs of the disadvantaged in society. In 2016, Keppel FELS clocked over 1,900 volunteering hours.

During the Lunar New Year, a Keppel FELS CSR committee sold custom-made Ezlink cards and raised over \$4,800 for beneficiaries from Thye Hua Kwan (THK). On 15 September 2016, volunteers from Keppel FELS also organised a Mooncake Festival celebration for up to 50 beneficiaries from THK at Taman Jurong.

Over in Brazil, the inauguration of Keppel Volunteers Brazil took place on 28 July 2016 when BrasFELS hosted a group of students with special needs on a visit to the shipyard. They had the opportunity to witness the shipyard receiving the Olympic Torch bearer and representatives of the Olympic Committee who disembarked from a boat at BrasFELS during their journey through Angra dos Reis.

On Brazil's National Volunteer Day which took place on 28 August 2016, volunteers from BrasFELS visited the residents of Associação São Vicente de Paulo, an elderly home in Angra dos Reis, Rio de Janeiro, Brazil. Besides donating essential necessities, volunteers also engaged the residents of the home and put up singing performances to brighten up their day.



Armed with a guitar and melodious tunes, employees from BrasFELS brightened the lives of residents in an elderly home in Angra dos Reis in August 2016.

Through BrasFELS' Teach-It-Forward Programme, which began in 2015, volunteers also contributed to the education of school goers by providing tuition classes in Portuguese and Mathematics to students who face difficulties in these subjects. 2016 saw four runs of the programme, lasting five weeks each, being carried out.

Keppel O&M was once again the presenting sponsor of *PianoBotanica*, an annual outdoor concert that celebrates the friendship between Brazil and Singapore. Held on 11 September 2016, the concert saw Brazilian soprano Taiana Froes perform to thousands at the Singapore Botanic Gardens.

Promoting the arts, Keppel sponsored the 6th edition of the Keppel Latin American Film Festival which was held in November 2016 and was jointly organised by the embassies of Brazil, Colombia, Costa Rica, Chile, Mexico, Panama, Peru, Venezuela and Uruguay in Singapore.

Protecting our Environment

From green initiatives such as reducing electricity consumption to coastal cleanups, Keppel O&M is also actively involved in environmental conservation efforts.

To pledge our support for Earth Hour and climate change action, various Keppel O&M's yards around the world set aside an hour to switch off their lights on 19 March 2016.

In China, employees from Keppel Nantong organised a series of environmental protection activities in March 2016, including participating in Earth Hour, as well as signing a petition to pledge their support for environmental protection.

At Keppel FELS Engineering Wuhan, employees participated in the cleanup of Tong Son Lake and helped in separating the different types of garbage.

To encourage proper waste management in Batangas, Keppel Batangas Shipyard supported a waste disposal campaign initiated by Barangay Bolo, a local community located next to the yard. 14 garbage bins made from recycled oil pails were donated by the yard. The garbage bins are now being used at Barangay's covered courts. Over at Keppel Subic Shipyard, 100 employees celebrated the 46th Earth Day by planting seedlings in the surrounding areas of the yard.

Volunteers in BrasFELS also participated in a beach cleanup event at the Amendoeiras beach in September 2016 which was held in conjunction with the World Annual Coastal Cleanup Day.

Mark of Recognition

For its extensive efforts in nurturing the community, Keppel O&M bagged several Corporate Social Responsibility (CSR) awards in 2016.

On 14 April 2016, Keppel Subic Shipyard was conferred the Outstanding

In Keppel O&M's 20 yards around the world, our green efforts ensure energy efficiency in all our operations and reduce our carbon footprint.



Keppel Volunteers engaging the residents of THK in making snowskin mooncakes.

Community Development

From workshops to lectures, Keppel O&M actively facilitates the exchange of ideas and strategies in order to deepen industry knowledge.

Community Projects Award by the Philippines Economic Zone Authority (PEZA) in recognition of the yard's sterling CSR efforts.

Over in Batangas, the Philippines, a Certificate of Recognition was presented to Keppel Batangas Shipyard in October 2016 for the invaluable support to the Alay Lakad Association of Bauan in providing training for out-of-school youths.

In recognition of its efforts in energy conservation, Keppel Shipyard received the Energy Efficiency National Partnership Award for Best Practices (Honourable Mention) from the National Environment Agency of Singapore in October 2016.

A project team led by Keppel Shipyard explored how they could tweak the design

of existing ventilation blowers so that they can be more energy-efficient. Their innovation resulted in a more eco-friendly design, lowering the footprint of each blower by 6.22 tonnes of carbon dioxide equivalent and 14,400kWh of energy per year.

Industry Promotion

Through a wide range of knowledge building platforms and conventions, Keppel O&M facilitated the exchange of ideas and strategies to bolster the industry.

In April 2016, we supported the second edition of the Offshore Marine Forum held during the Singapore Maritime Week as a platinum sponsor. The forum featured a discussion on key issues in the offshore and marine industry by a panel of experts, including Mr Chow Yew Yuen, then-CEO of Keppel O&M.

In October 2016, Keppel O&M was one of eight key industry leaders that signed a Memorandum of Understanding with the new Technology Centre for Offshore and Marine Singapore (TCOMS), which seeks to enable the local offshore and marine engineering industry to undertake higher-value activities through global partnerships with the industry, research institutions and academia.

Keppel O&M also deepens public knowledge of the industry through the sponsorship of lectures, such as the Chua Chor Teck Memorial Lecture. Organised annually since 1986, the lecture has been a valued platform for industry leaders and experts to share their insights on a variety of offshore and marine-related topics. At the 30th lecture, Mr Choo Chiau Beng, former CEO of Keppel Corporation, provided insights into Keppel's strategy in surviving challenging periods and seizing opportunities to become a leader in the industry.

Another platform for the promotion of industry research is the Keppel O&M lecture. The 13th edition held in January 2016 saw an insightful sharing by Mr Lim Chuan Poh, Chairman of Singapore's Agency for Science, Technology and Research (A*STAR), on existing and possible collaborations between public researchers and the various industries in Singapore.

As part of ongoing efforts to foster deeper collaboration within the industry, Keppel O&M also hosted a delegation from the International Organisation for Standardisation (ISO) Technical Committee for Offshore Structures in January 2016. The delegates, consisting of

Volunteers and management of Keppel FELS participated in a beach cleanup at Pasir Ris Beach in Singapore in December 2016 to preserve the environment.



over 40 researchers from international and national oil companies such as ExxonMobil, Royal Dutch Shell and BP, exchanged ideas on how technological innovations can improve work processes in the offshore and marine industry.

Educational Outreach

On top of Keppel O&M's ongoing efforts to innovate and identify growth areas, Keppel also collaborates with leading educational and research institutes to develop structured programmes and internships so that students will benefit from a better understanding of the offshore and marine industry. Since 1987, Keppel O&M has offered 418 scholarships to outstanding candidates interested to pursue a career in the offshore and marine industry. In 2016, 174 internship places were offered to students from both Singapore and overseas educational institutions.

In October 2016, a full-day workshop was organised for lecturers from the Mechanical Engineering Division of Ngee Ann Polytechnic where industry practices, present market conditions, as well as the industry outlook were discussed.

Besides seminars and workshops, Keppel O&M also conducts yards tours

and participates regularly in recruitment fairs and career talks to reach out to students and raise awareness of the industry.

Keppel was also a co-sponsor of the Amazing Maritime Challenge, held in conjunction with the Singapore Maritime Week, and organised by the Maritime and Port Authority of Singapore. Through a series of games, over 800 participants of the challenge were able to learn more about Singapore's rich maritime heritage.

At Keppel Subic Shipyard in the Philippines, the College Scholarship Programme helps to nurture young talent with financial difficulties and the Apprenticeship and Technical Skills Training Programme provides vocational training for school leavers.

Engaging the Global Industry

As a leading company in the offshore and marine industry, Keppel O&M actively participates in major trade and industry conventions and exhibitions to exchange industry insights and network with clients and partners.

From 22 to 25 March 2016, Keppel O&M participated in the second Offshore Technology Conference Asia (OTC Asia) 2016 held in Kuala Lumpur, Malaysia.

The annual OTC in Houston, Texas, held from 2 to 5 May 2016, is another platform that Keppel O&M regularly participates in to showcase our award-winning products and to strengthen networks with customers and business associates.

In June 2016, Keppel O&M showcased its wide array of marine solutions at Posidonia 2016, a biennial international shipping exhibition held in Athens, Greece.

At the 2016 Pareto Securities Oil & Offshore Conference held in Oslo, Norway, Mr Chow Yew Yuen, then-CEO of Keppel O&M, shared on Keppel's multi-pronged approach in responding nimbly and flexibly to market needs.

Keppel O&M was also invited to present a breakout session for the first time at the Arctic Circle Assembly (ACA), which took place from 7 to 9 October 2016 in Reykjavik, Iceland. The Keppel team, which was the only Singaporean organisation to present at the ACA, shared on the academic and business partnerships between Singapore and the Arctic countries.



Representing Keppel O&M, then-CEO Mr Chow Yew Yuen (fifth from left) signed a Memorandum of Understanding with the Technology Centre for Offshore and Marine Singapore during its launch which was officiated by Mr S Iswaran (eight from left), Minister for Trade and Industry (Industry). (Photograph courtesy of the National University of Singapore)

Near Market, Near Customer



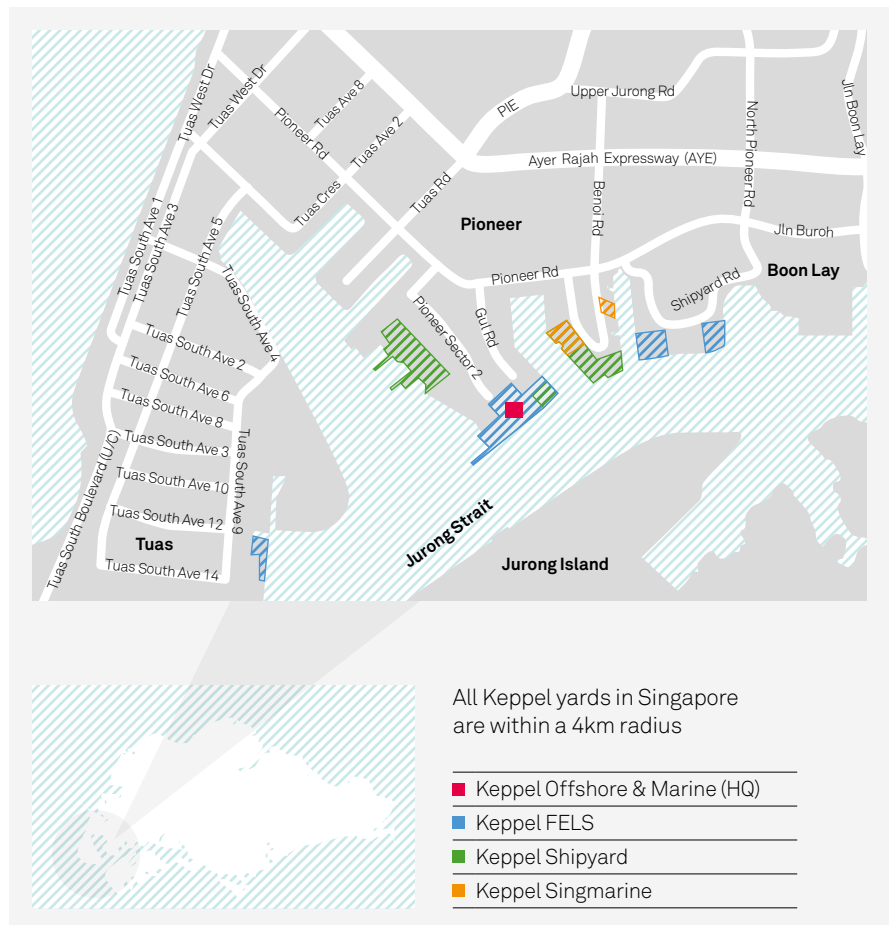
Four floating cranes support the lifting capabilities of the yards in Singapore:

- Asian Hercules III (5000MT)
- Asian Hercules II (3200MT)
- Asian Hercules (1600MT)
- Asian Helping Hand III (400MT)

Keppel Offshore & Marine’s network of yards worldwide are strategically located to meet the needs of our customers and bring our suite of proprietary solutions into more markets. By continuously strengthening our capabilities, we have the agility to take on a wider variety of projects as well as improve efficiency and safety.

From Singapore to China to Brazil, we have upgraded facilities or installed new equipment with greater capabilities to improve operations and enhance efficiency. The specifications of the individual

yards can be found on page 80 – 81 of this report. We will continue to go where our customers require us, and will focus on markets which have growth potential and are commercially viable for us.



Singapore

Singapore is the headquarters of Keppel Offshore & Marine which has seven yards in the country that are located within a 4km radius, enabling the yards to harness and share resources easily.

Keppel FELS

Keppel FELS leads the industry in the design and building of high-performance mobile offshore rigs. Our portfolio of proprietary designs and floating production solutions meets a broad spectrum of operating requirements including deep waters and harsh environments. Since 2000, it has delivered the most number of jackup rigs and semisubmersibles (semi) in the world.



Capabilities

- Design and construct jackup rigs, semi rigs, floating production systems and other advanced vessels such as drillships
- Repair, upgrade and conversion of offshore rigs
- Design and development of critical rig equipment
- Fabrication of offshore structures and rig components



Key Equipment & Facilities

- Two drydock goliath cranes: 700MT and 500MT
 - The two cranes cover the fabrication and painting areas all the way to the drydock. It enables the yard to construct the modules of rigs in larger blocks which can then be lifted from the fabrication area to the drydock for assembly
- CAN-DO floating dock 138m x 78m
- Automated panel line workshop
- Automated pipeshop

Keppel Shipyard

Backed by over a century of experience, Keppel Shipyard is the industry's leading partner for the repair, conversion and upgrading of a diverse range of vessels. It has delivered over 120 FPSO/FSO/FSRU conversions.



Capabilities

- Conversion of FPSO/FSO/FSRU/FLNGV
- Repair, upgrading and conversion of a diverse range and capacity of vessels such as LNG carriers, livestock carriers, drilling tenders, and derrick lay barges
- Topside engineering, fabrication and integration
- Fabrication, installation and integration of mooring solutions such as turrets and spread mooring systems



Key Equipment & Facilities

- Automated pipeshop
- 20,000 tonne load-out quay in Benoi
- Deep draft of 12m in Benoi quay
- 400m x 64m dry dock in Tuas
- In-house safety training and wellness centre

Keppel Singmarine

Keppel Singmarine has a strong track record for reliable and versatile newbuild solutions, having constructed more than 400 ships of diverse types and sophistication levels for operations around the world.



Capabilities

- Design and build a wide range of specialised vessels, including icebreakers and ice-class vessels, pipelay vessels, subsea construction, rock dumping and diving support vessels, platform supply vessels, anchor handling tugs and anchor handling tug/supply vessels, harbour and ocean-going tugs, as well as LNG solutions and dredgers



Key Equipment & Facilities

- Automated pipeshop with robotic profile cutter and 6-axis robotic welding
- Automated panel line workshop



Keppel Shipyard's Tuas Yard.

Near Market, Near Customer

Asia

Our yards in China and the Philippines have been configured to take on more complex projects and to support our Singapore yards.

China

Keppel Nantong Shipyard (KNS) and Keppel Nantong Heavy Industry (KNHI)

Keppel Nantong Shipyard (KNS) has been receiving the annual Industrial Excellence and Safety Excellence award by the Nantong Municipal People's Government since 2010. Next to KNS is Keppel Nantong Heavy Industry (KNHI), which was set up in 2011 and has increased total yard space of Keppel Nantong from 190,000sm to 430,000sm.



Capabilities

- KNS constructs a wide range of vessels and offshore structures
- KNS was the first shipyard in China to be awarded the highest grade of safety certification from the Chinese State Administration of Work Safety
- Located along the Yangtze River, about 150 km north-west of Shanghai with close proximity to supporting offshore and marine industries in the Municipality of Nantong
- KNHI supports Keppel O&M's construction work from China by producing up to 32,000MT of steel structures annually
- KNHI can undertake heavy offshore fabrication projects including jackup rigs and semisubmersibles



Key Equipment & Facilities

- KNS has extensive berths, advanced mechanical transfer and launching systems, and comprehensive workshops
- Shoreline of 1,000m and wharf length of 535m
- KNHI has panel line fabrication workshops, a 600MT gantry crane and a 140m (L) by 80m (W) slipway to launch structures of up to 24,000MT
- With KNHI's newly established facilities, a complete upper hull for a semisubmersible can now be built and delivered in one single megablock

The Philippines

Keppel Batangas Shipyard

Started in 1975, Keppel Batangas is the first overseas venture of the Keppel Group. Its shipyard at the Keppel Philippines Marine – Special Economic Zone is strategically located along the main trading routes of vessels in the region.



Capabilities

- Offshore rig fabrication
- Shiprepair and conversion
- Shipbuilding track record of more than 100 newbuilds



Key Equipment & Facilities

- Keppel Batangas operates a 200m x 38m, 50,000 dwt capacity handy max graving dock
- The yard is able to accommodate simultaneous repair projects using its shiplift system to bring vessels to any of its seven dry berths which are capable of docking vessels up to 20,000 dwt
- The newly-installed 300T gantry crane will facilitate the assembly of complete vessels at Berth 3 & 4
- Modern panel line workshop, hull shop and assembly slabs with 40T gantry cranes and sheds support efficient shipbuilding activities
- The yards' four assembly areas are equipped with mobile sheds and gantry cranes allowing for continuous production work on newbuild and fabrication projects

Keppel Subic Shipyard

Located in the Subic Shipyard – Special Economic Zone, Keppel Subic Shipyard is the leading shipyard in the region providing greater flexibility and turnaround times for ship owners.



Capabilities

- Offshore structure/platform fabrication
- Topside module fabrication
- Shiprepair, marine and FPSO conversion
- Successfully completed Depletion Compression Platform (DCP) for the Malampaya Phase 3 Project of Shell Philippines Exploration. It is the first such platform to be fully constructed in the Philippines



Key Equipment & Facilities

- Operates a 550m x 65m drydock, one of the largest in the Philippines capable of co-drydockings
- Carries out a wide range of repair and modification works on a variety of vessels with drafts over 8.5m alongside the yards' berthing quays with a total of 942m length
- Fabrication areas totalling to 94,000m² with a 1,500T capacity gantry crane, the biggest in the Philippines at the grand assembly area
- Services double-banked Panamax and Capesize vessels undergoing afloat repair using its 100m jib crane with lifting capacity of 35T



Keppel Nantong Shipyard in China.

Americas

The Americas contains some of the world's largest hydrocarbon reserves and is dominated by oil majors. Keppel O&M's yards in the United States (US) and Brazil are strategically located to serve one of the most robust oil and gas regions in the world.

US

Keppel AmFELS

Strategically located at the gateway of the Gulf of Mexico, Keppel AmFELS is the foremost offshore and marine shipyard in the Gulf of Mexico, backed by a confluence of strengths such as a sheltered waterfront area, a massive drydock and modern steel-processing plant.



Capabilities

- Yard space of 555,438sm
- Construction, refurbishment, conversion, life extension and repair of a complete range of mobile drilling rigs, vessels, production platforms, land rigs and modules.



Key Equipment & Facilities

- Floating dry dock with a lift capacity of 37,000 LT
- Manitowoc 21000 crane capable of lifting 1,000 short tonnes and with a maximum reach of 640ft
- Floating crane, Atlantic Giant, has a lifting capacity of 700 short tonnes

Brazil

Keppel FELS Brasil/BrasFELS

The most well-equipped yard in Latin America, BrasFELS plays a key role in helping to meet Brazil's energy aspirations.



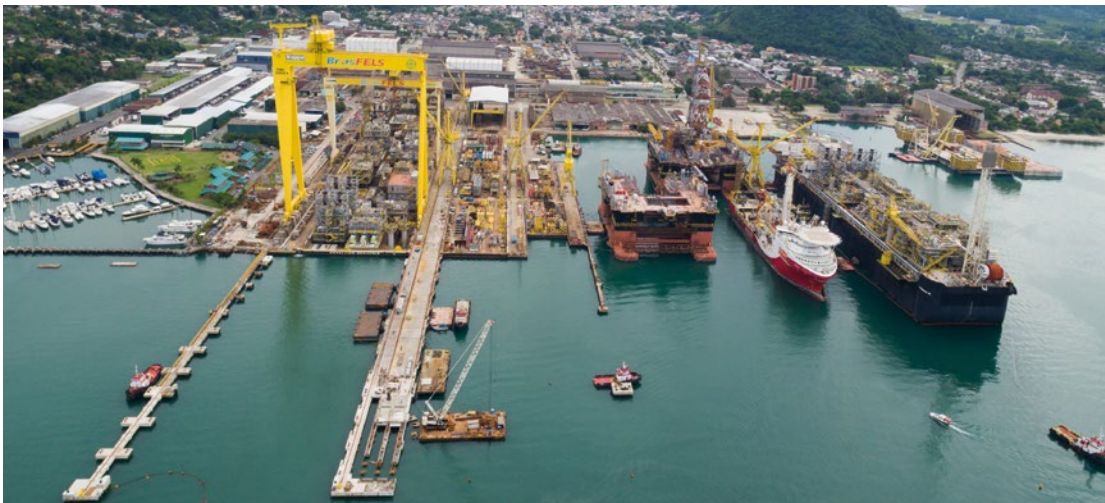
Capabilities

- Yard space of 540,000sm
- Construction, refurbishment, conversion, life extension and repair of a complete range of mobile drilling rigs and production platforms



Key Equipment & Facilities

- Gantry crane with 2,000MT lifting capacity
- FS-1 floating dock (130m x 71m)
- Gantry crane with 660MT lifting capacity
- Assembly area with movable sheds
- 720m of berthing space integrated with customs clearance facilities



BrasFELS yards in Angra dos Reis, Rio de Janeiro.

Near Market, Near Customer

Europe

Netherlands

Keppel Verolme

Keppel Verolme operates a comprehensive yard in Rotterdam, the Netherlands, which is in close proximity to the gas and oil fields of the Netherlands, UK, and Norway, and has direct access to the North Sea.



Capabilities

- Dry-docking, repair and maintenance, modification, conversion and construction of various vessel types and offshore units
- Serve the decommissioning market in dismantling and recycling any offshore structure
- Support European offshore wind energy sector with value-added services and solutions



Key Equipment & Facilities

- Three graving drydocks with the largest drydock measuring 405m x 90m, with water depth of 11.6m
- 2,000m of quay side with a water depth of up to 12m

Keppel Verolme in The Netherlands.

Caspian Sea

The Caspian Sea region is one of the oldest oil-producing areas in the world and is an increasingly important source of global energy production.

Azerbaijan

Caspian Shipyard Company

Caspian Shipyard Company (CSC) in Azerbaijan is the first international rig construction, repair and conversion yard in the Caspian Sea region servicing the offshore oil and gas industry. It has a track record of delivering the first semisubmersible, jackup rig and ice-class Floating Storage and Offloading (FSO) vessel built in-country.



Capabilities

- Offshore rig construction, repair and conversion
- Able to support the completion of rigs going to the Black Sea



Key Equipment & Facilities

- Quay berthing space: 250m
- Reinforced load-out quay area: 3,700m² (80t/m²)
- Workshop: structure, piping, electrical, mechanical
- Material handling equipment



Capabilities

- Construction of a wide range of specialised vessels and merchant ships including subsea vessels, anchor handling tug/supply vessels and multi-purpose offshore support vessels
- Shiprepair and conversion
- Able to undertake offshore structure construction and repairs
- When operating at full capacity, it is able to undertake up to 100 repairs and conversions per annum and is estimated to achieve an average annual steel output of 25,000MT



Key Equipment & Facilities

- Floating dry dock 168m x 50m
- 300m x 30m finger pier
- 450m of quay berthing space with 25MT level luffing crane
- 275m x 80m of new building berth
- 323m x 136m transfer slab for repair services
- Blasting and painting hall equipped with full abrasive recovery system, dehumidifier, silo and blast and paint machines
- Steel fabrication, pipe fabrication, mechanical and electrical workshop housing the most modern machines



Middle East

Holding some of the world's largest oil and gas reserves, the Gulf provides one of the best offshore environments in the world for oil and gas production, offering shallow and relatively calm waters.

Qatar

Nakilat-Keppel O&M

Nakilat-Keppel O&M (N-KOM) is a 508,000sm world-class shipyard facility located at the north-eastern tip of Qatar, next to the gas loading terminals in the Ras Laffan Port. In operation since 2011, the shipyard has delivered more than 500 marine and offshore projects. It is the leading provider of repairs and maintenance for gas carriers in the region, having completed more than 100 LNG carrier repairs.



Capabilities

- Shiprepair and conversion
- Construction and maintenance of offshore structures (jackup rigs, liftboats, jackets & piles, etc.)
- Provider of green shipping & gas-related marine solutions (e.g. BWTS installations, ME-GI conversion, etc.)
- Leading provider of repairs and maintenance for gas carriers



Key Equipment & Facilities

- Two VLCC-sized graving docks (400m x 80m and 360m x 66m),
- Q-max floating dock (405m x 66m)
- Eight quays and piers with a total berthage capacity of 3km and a 150m loading quay
- Electrical and instrumentation, steel, piping and mechanical and machinery workshops as well as a 9,600sm warehouse
- Cryogenic clean room
- Over 500,000sm of fabrication area
- Dedicated facility (200m floating jetty & dry berth) for small vessel repairs
- 300MT and 1,100MT mobile boat hoists
- Piston Crown Chromium plant facility

Emirate of Ajman

Arab Heavy Industries

Strategically located along the coast of the Emirate of Ajman, about 30 km from Dubai, Arab Heavy Industries (AHI) has built a reputation for being the preferred solutions partner for fleet owners and operators in the Arabian Gulf.



Capabilities

- Shiprepair and conversion, shipbuilding, as well as offshore structures repairs and modifications
- Newbuilding of tugboats, supply vessels, barges, landing craft, coastal freighters, jetties and pontoons



Key Equipment & Facilities

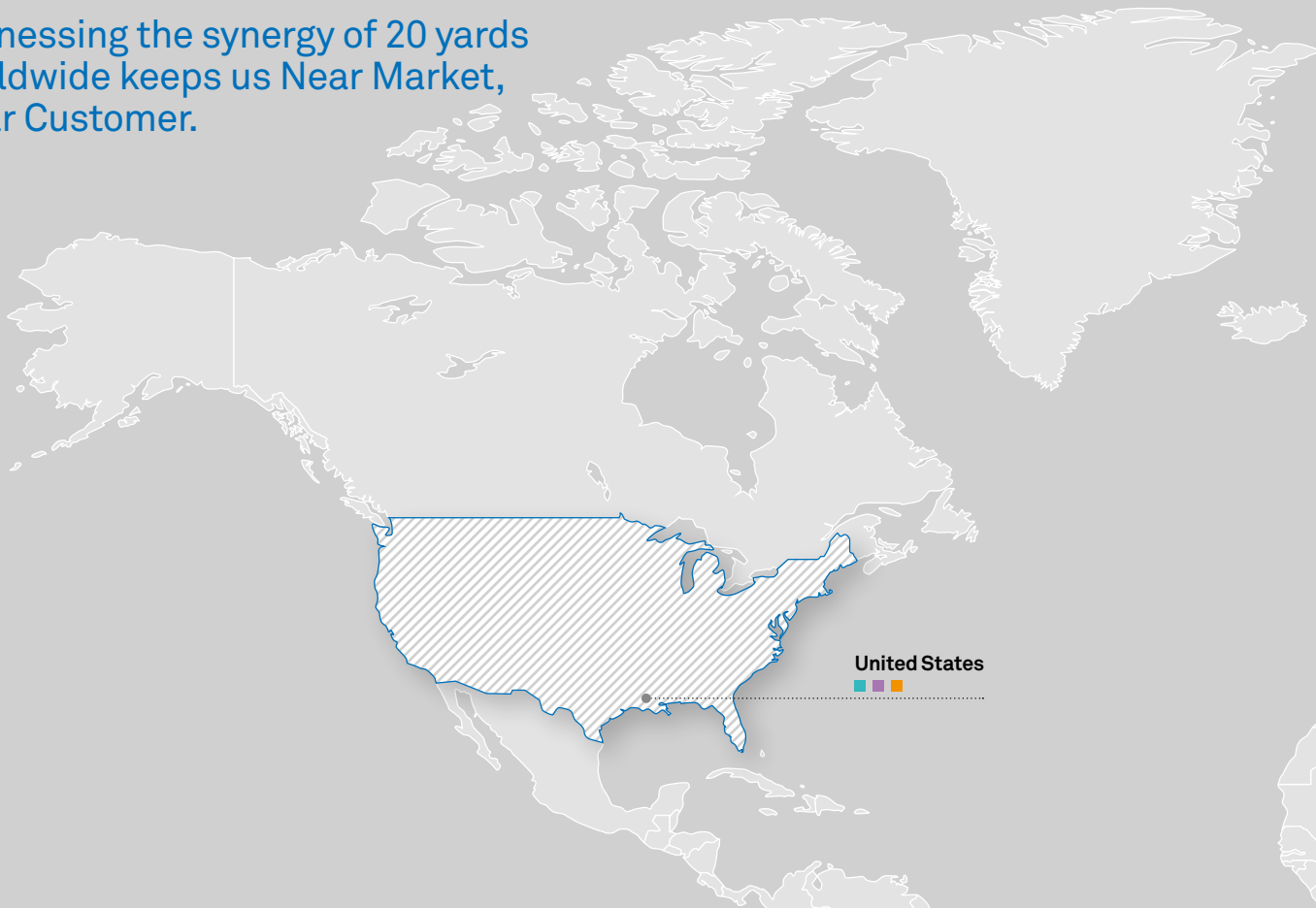
- Yard area of 270,000sm
- 9,000sm covered workshop
- 75,000sm open fabrication area



N-KOM yard in Qatar.

Yards & Offices

Harnessing the synergy of 20 yards worldwide keeps us Near Market, Near Customer.



Headquarters

Singapore

- Keppel Offshore & Marine Ltd (Headquarters)

Offshore & Marine

Azerbaijan

- Caspian Shipyard Company, LLC
- Baku Shipyard LLC

Brazil

- Keppel FELS Brasil S.A./BrasFELS
- Keppel Singmarine Brasil Ltda

China

- Keppel Nantong Shipyard Co. Ltd
- Keppel Nantong Heavy Industry Co. Ltd

Indonesia

- PT Bintan Offshore

Japan

- Regency Steel Japan Ltd

Qatar

- Nakilat-Keppel Offshore & Marine Ltd

Singapore

- Keppel FELS Ltd
- Keppel Shipyard Ltd
- Keppel Singmarine Pte Ltd

The Netherlands

- Keppel Verolme BV

The Philippines

- Keppel Philippines Marine, Inc
- Keppel Batangas Shipyard
- Keppel Subic Shipyard, Inc

United Arab Emirates

- Arab Heavy Industries PR.J.S.C.

US

- Keppel Offshore & Marine USA, Inc
- Keppel AmFELS, LLC

Engineering/R&D Centres

Bulgaria

- Keppel FELS Baltech Ltd

China

- Keppel FELS Engineering Shenzhen Co. Ltd
- Keppel FELS Engineering Wuhan Co. Ltd

India

- Keppel Offshore and Marine Engineering Services Mumbai Pte Ltd





Singapore

- Keppel Offshore & Marine Technology Centre Pte Ltd (KOMtech)
- Offshore Technology Development Pte Ltd
- Deepwater Technology Group Pte Ltd
- Marine Technology Development Pte Ltd
- Gas Technology Development Pte Ltd
- Keppel LeTourneau Singapore Ltd

UAE

- Keppel LeTourneau Middle East FZE

US

- Bennett Offshore, LLC
- Keppel LeTourneau USA, Inc.
- Keppel FloaTEC, LLC

Representative Offices

Australia

- Keppel Prince Engineering Pty Ltd

US

- Keppel Marine Agencies International, LLC

Vietnam

- Keppel FELS Ltd (Vietnam)

Marine Services

Singapore

- Asian Lift Pte Ltd
- Keppel Smit Towage Pte Ltd
- Keppel Sea Scan Pte Ltd

Business Units:

- Headquarters
- Offshore & Marine
- Engineering/ R&D Centres
- Representative Offices
- Marine Services

Yard Equipment & Facilities

	Total land area (square metres)	Type	Dock capacity Capacity (dead weight tonnes)	Berthage			Outfit quay		
				Size (metres)	Length (metres)	Draft (metres)	Building berth (capacity)	Length (metres)	Depth (metres)
Singapore									
Keppel FELS Ltd (Pioneer)									
Admiral Dock	284,292.3	Drydock	400,000	380 x 80	380	13			
FELS CAN-DO		Semisubmersible Barge	30,000 lifting	138 x 78					
		Berth space						1,400	8 – 11
Pioneer Zone II									
	139,073	Berth space						350	4.5 – 6
Shipyards Road									
	88,289	Berth space						500	4.5
Crescent Zone									
	98,919	Berth space						740	7
Tuas South Zone									
	131,289	Outfit Quay						300	4 – 5
Keppel Shipyards Ltd (Tuas)									
Tuas Dock	443,423	Drydock	360,000	350 x 66		2,507			
Raffles Dock		Drydock	400,000	400 x 64					
Temasek Dock		Drydock	150,000	301 x 52					
Temasek Pier East		Berth space			280				
Finger Pier West		Berth space			350				
Finger Pier East		Berth space			370				
Raffles Pier West		Berth space			430				
Raffles Pier East		Berth space			230				
West Quay		Berth space			450				
South Quay		Berth space			177				
Raffles Dock Entrance		Berth space			220				
Keppel Shipyards Ltd (Benoi)									
Drydock No. 1	350,000	Drydock	300,000	350 x 60					
Drydock No. 2		Drydock	170,000	300 x 60					
No.1 Quay		Berth space				217			
No.2 Quay		Berth space				220			
No.2 Quay/Extension		Berth space				340			
No.3 Quay		Berth space				280			
No.4 Quay		Berth space				224			
No.5 Quay		Berth space				156			
Dock 1 Entrance		Berth space				200			
Landing Quay		Berth space				100			
Building Berth		Slipway		230 x 70					
Keppel Shipyards Ltd (Gul)									
FD No. 1	140,000	Floating Dock	14,000 lifting	190 x 32					
FD No. 2		Floating Dock	5,000 lifting	114 x 27					
FD No. 3		Floating Dock	12,000 lifting	170 x 27					
North Quay 1		Berth space				177			6.5
North Quay 2		Berth space				193			6.6
North Quay 3		Berth space				160			6.6
Keppel Singmarine Pte Ltd									
Drydock in Benoi 5	149,924	Drydock	5,000	105 x 18.5					8.2
Building Berth in Benoi 15		Slipway		225 x 38.5(min) – 72.5(max)					
Building Berth in Benoi 5		Slipway		120 x 27.5					
Wharf in Benoi 5		Wharf				132			5
Quay 5 in Benoi 15		Berth space				156			7
Azerbaijan									
Baku Shipyards LLC									
28 May Floating Dock	720,000	Floating dock	25,000 lifting	168 x 50					7.5
Repair Slab on Shore		Berth space on Land	18,000 for transfer mode	250 x 140					7.5
East Quay		Berth space				250			7.5
West Quay		Berth space				130			7.5
Finger Pier		Berth space				300			7.5
Caspian Shipyards Company Ltd									
Yusif Ibrahimov (Hull 901)	60,000	Floating Dock	15,000	128 x 74.5					6.5
Floating Dock (Hull 953)		Floating Dock	5,000	128 x 21.7					6.5
Floating Dock (Hull 806)		Floating Dock	4,500	102 x 20					6.5
Jetty 3								280	6.5
Jetty 4								100	4.5
Brazil									
Keppel FELS Brasil S.A. (BrasFELS Yard)									
Drydock	522,230	Graving Dock		125 x 70					
FS1 Floating Dock		Floating Dock	22,000	120 x 57			10		
Slipway No. 1		Slipway	35,000	174 x 30					
Slipway No. 2		Slipway	150,000	310 x 45					
Slipway No. 3		Slipway		185 x 70					

	Total land area (square metres)	Type	Dock capacity Capacity (dead weight tonnes)	Berthage			Outfit quay		
				Size (metres)	Length (metres)	Draft (metres)	Building berth (capacity)	Length (metres)	Depth (metres)
Brazil (cont'd)									
Finger Pier East		Outfit Quay			360	4 – 13			
Finger Pier West		Outfit Quay			360	4 – 13			
Outfit Pier East		Outfit Quay			300	4 – 8,5			
Outfit Pier West		Berth space			120	7 – 8			
Slipway 2 Pier		Berth space			230	4 – 10			
Slipway 3 Pier		Outfit Quay			230	6 – 9			
China									
Keppel Nantong Shipyard Co. Ltd	190,000								
Slipway No. 1		Slipway	3,000	90 x 33					
Wharf No. 1		Wharf				80	7		
Keppel Nantong Heavy Industry Co. Ltd	235,900								
Slipway No. 2		Slipway	24,000	140 x 84					
Wharf No. 2		Wharf				80	7		
The Philippines									
Keppel Subic Shipyard, Inc	688,831								
Pacific Dock		Graving Dock	550,000	550 x 65					
C Quay						279	9.0		
E1 Quay						351	8.5		
E2 Quay						312	7.5		
Keppel Batangas Shipyard	354,576								
President Dock		Graving Dock	50,000	200 x 38					
Ship Lift System		Lift Platform	20,000	175 x 28					
		Dry Berth: 7	Dry Berth: 7						
Pier No. K1						68 x 2	6		
Pier No. K2						83 x 2	6		
Pier No. 1						183	8		
Pier No. 2						160	8		
Pier No. 3						70	8		
Pier No. 4						155	8		
The Netherlands									
Keppel Verolme BV	554,000	Berth Space				1,600	9 – 12	400	9 – 12
Dock No. 5		Graving Dock	65,000	230 x 35.5			8		
Dock No. 6		Graving Dock	130,000	275 x 41			10.30		
Dock No. 7		Graving Dock	500,000	405 x 90			11.60		
Qatar									
Nakilat-Keppel Offshore & Marine Ltd	508,000								
Dry Dock No. 1		Drydock	350,000	360 x 66	360	11			
Dry Dock No. 2		Drydock	450,000	400 x 80	400	12			
Laffan Floating Dock		Floating Dock	120,000t lifting capacity	405 x 66					
1 Quay					400				11
1 Quay					400				11
Loading Quay					150				11
1 Pier					400				11
1 Pier					400				11
1 Pier					400				11
1 Pier					400				11
1 Floating Pier					200				11
1 Quay					400				11
United Arab Emirates									
Arab Heavy Industries PR.J.S.C.	273,000								
Al Zora Drydock		Graving Dock	30,000	175 x 32			7		7
Slipway No. 1		Slipway	*1,500	120 x 16					
Slipway No. 2		Slipway	*1,500	120 x 16			5		
Slipway No. 3		Slipway	*2,500	120 x 16					
Slipway No. 4		Slipway	*3,000	120 x 16			5		
Al Zora Wharf		Wharf				250			7
East Wharf		Wharf				200			5
West Wharf		Wharf				83			5
USA									
Keppel AmFELS, LLC	555,438								
Floating Drydock		Floating Drydock	37,594	94 x 111			10		
Launching Way						380	9.14		
West Dock Quay						153	9.14	153	9.14
East Dock Quay						293	10.67	293	10.67

* Light Displacement Tonnage

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