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18th

# SINGAPORE INTERNATIONAL BUNKERING Conference and Exhibition

14-17 October 2014  
Resorts World Sentosa, Singapore



4 days



1,600 participants



50 countries

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BP Singapore

KEYNOTE ADDRESS



**Jeremy Nixon**  
CEO,  
Global Liner Division  
NYK Line

INDUSTRY ADDRESS



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- ▶ Singapore's update on standardisation and control
- ▶ Price outlook for different fuel grades
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- ▶ Scrubber economics and technology developments
- ▶ Implementation of Mass Flow Meters
- ▶ LNG fuel uptake
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**publisher**



**Maritime and  
Port Authority of  
Singapore**

460 Alexandra Road  
#19-00 PSA Building  
Singapore 119963  
Tel: +65 6375 1600  
Fax: +65 6275 9247  
www.mpa.gov.sg

**executive editor**

Shirley Tan  
**advisory committee**  
Andrew Tan  
Tan Beng Tee  
M Segar Abdullah  
Khong Shen Ping  
Toh Ah Cheong  
Leanna Lim  
Parry Oei  
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Tan Suan Jow  
Bernice Yeoh  
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**managing editor**

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**publishing agent**

**SPHmagazines**

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**group editor**

**editorial & creative**  
Dora Tay  
**senior editor**  
Lediati Tan  
**associate editor**  
Annabelle Bok  
**sub-editor**  
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**associate creative director**  
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**art director**

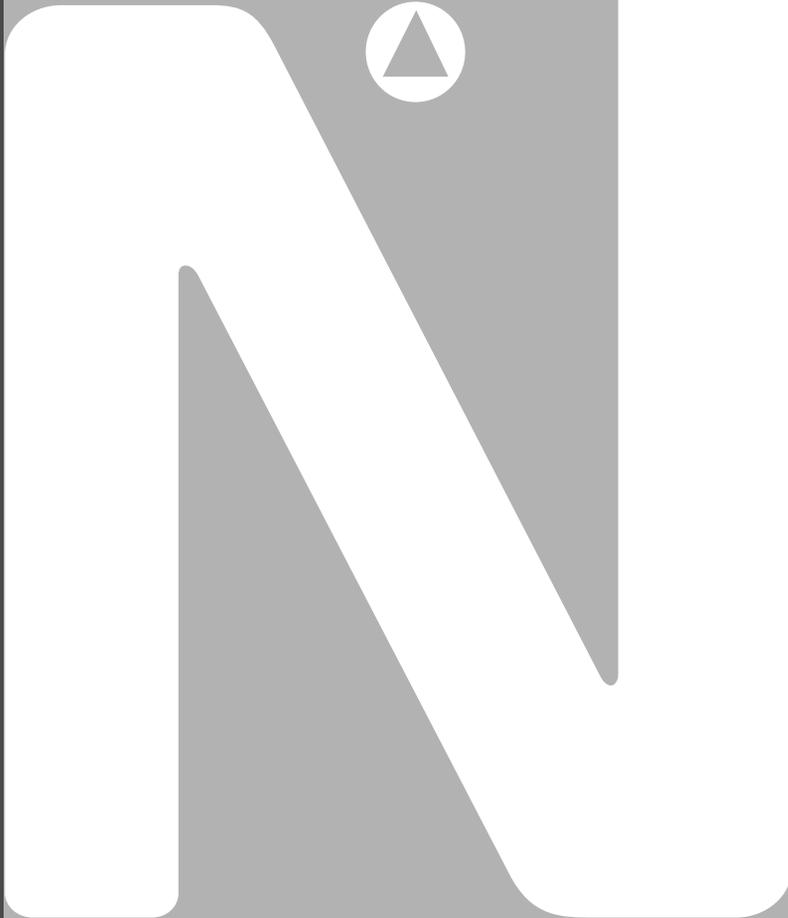
Dennis Pua  
**managing director**  
Christopher Chan  
**general manager**

**sales & client management**  
Kaz Lim  
**associate account director**  
Charmaine Soh  
csoh@sph.com.sg  
**group account manager**  
Christine Chionh  
**assistant manager**  
**business development & client management**

**publishing services**

Nurin Farah Adam  
**coordinator**  
  
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## Thank you, seafarers

Many are aware that shipping accounts for some 90 per cent of world trade, but few ever think about the indispensable role that seafarers play in moving these ships around the world. This issue of *Singapore Nautilus* pays homage to these oft-overlooked individuals who enable our easy access to basic necessities and luxury products alike, by shipping them to our doorsteps.

In our Feature, we talk to four seafarers and find out what it's like on the job. They share their personal challenges and difficulties, like being away from their families and homes for long periods, their experiences at sea, and what they love most about their jobs.

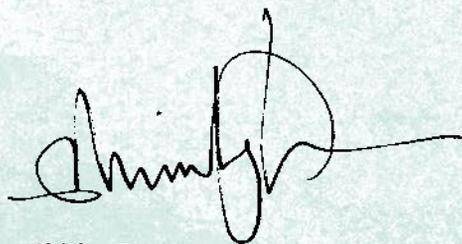
This instalment of Maritime Careers looks into the role of a ship captain, and finds out exactly what it takes to be a master of a ship's crew and command a vessel out at sea. Captain Dominic Tan, a shipmaster with ASEAN Cables, offers his invaluable experiences and opinions in this piece.

Back in April 2014, MPA made

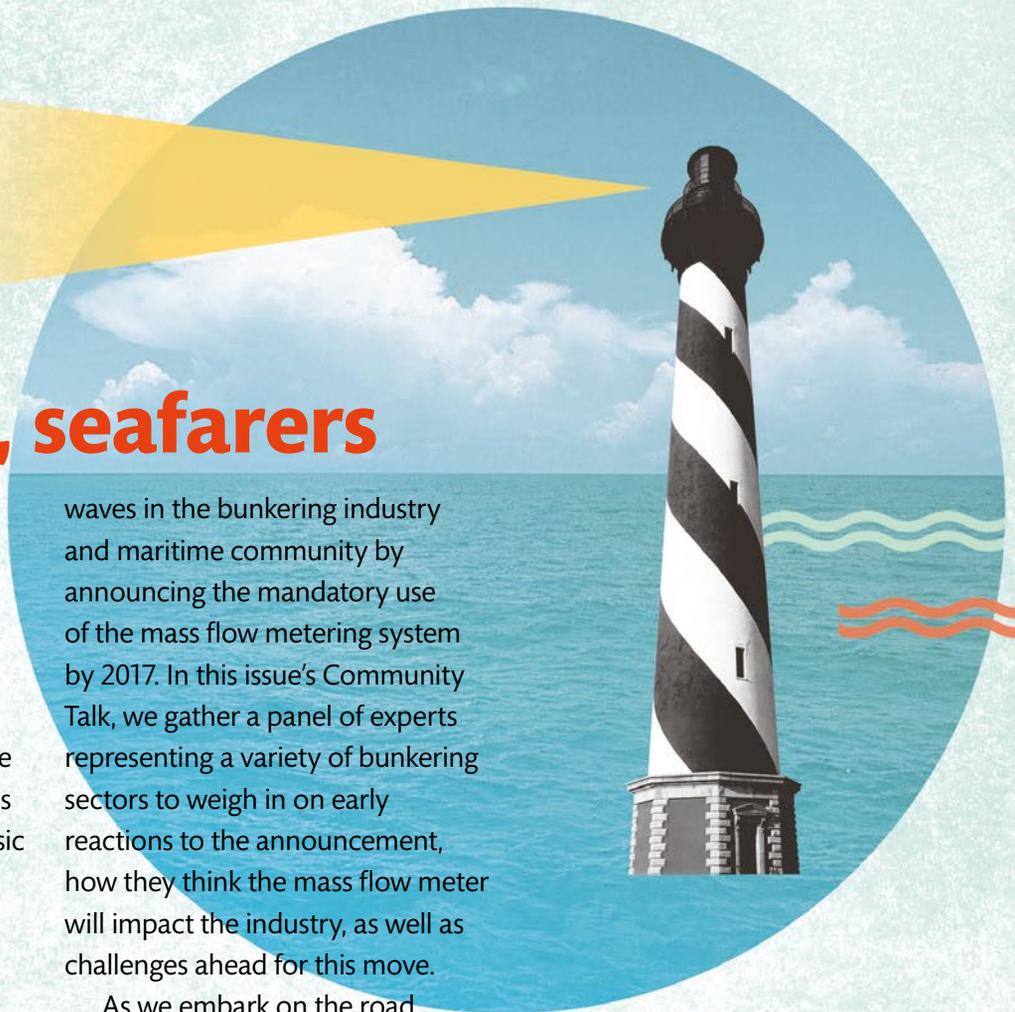
waves in the bunkering industry and maritime community by announcing the mandatory use of the mass flow metering system by 2017. In this issue's Community Talk, we gather a panel of experts representing a variety of bunkering sectors to weigh in on early reactions to the announcement, how they think the mass flow meter will impact the industry, as well as challenges ahead for this move.

As we embark on the road towards making Singapore a venue of choice for maritime arbitration, read how the Singapore Chamber of Maritime Arbitration took the step to revamp their arbitration framework to gather more business in Maritime Services, and why this turned out to be a great success.

Happy reading!



**Shirley Tan**  
Executive Editor



## Port of Singapore is first to adopt mass flow metering system

► At the Singapore Bunkering Symposium held on April 8, Mr Lui Tuck Yew, Minister for Transport, announced that the Port of Singapore is the first in the world to mandate the use of a mass flow meter (MFM) system for bunkering, setting a new benchmark for bunkering practices worldwide.

In his opening address, Mr Lui highlighted that the adoption of MFMs for ship refuelling not only enhances transparency in the bunkering process, but also improves operational efficiency and increases the productivity of the entire industry.

The Maritime and Port Authority of Singapore (MPA) believes that the adoption of an MFM system for bunkering in the Port of Singapore will provide better assurance



ABOVE: Mr Lui Tuck Yew, Minister for Transport, announcing the mass flow meter system adoption at the Singapore Bunkering Symposium during Singapore Maritime Week.

to both bunker buyers and suppliers on the quantity of bunker delivered, and uphold Singapore's position as the world's top bunkering port.

Mr Andrew Tan, Chief Executive, MPA, said: "To safeguard Singapore's reputation as a top bunkering port in the world, we are taking the lead in being the first to mandate the use of mass flow meters. It is a significant milestone for the bunkering industry in Singapore and it will strengthen our position in the long term as a reliable and trusted port for bunkering operations."

It will be mandatory for bunker suppliers to use MFMs for bunker delivery of marine fuel oil (MFO) in Singapore from Jan 1, 2017. MPA will offer a lump sum incentive of S\$80,000 for each existing bunker tanker delivering MFO in Singapore to help the industry offset a portion of the cost of MFM system adoption.

To ensure that the MFM system is suitable to be used for bunkering, MPA and SPRING Singapore jointly initiated an MFM Working Group, comprising various stakeholders, to develop and validate the use of MFMs in 2009. The Working Group has conducted extensive MFM system trials since 2011.

MPA has also undertaken close consultation with the industry in implementing the mandatory system, and many members are supportive.

## Raising awareness of Arctic issues



► The Norway-Singapore Arctic Symposium was held on March 14 to raise awareness and facilitate discussion of Arctic issues among stakeholders.

Co-organised by the Maritime and Port Authority of Singapore (MPA) and the Royal Norwegian Embassy, the event was attended by more than 100 participants comprising shipping industry partners, members of the Singapore Shipping Association, agencies, researchers and students, as well as members of the local Norwegian business community.

Topics covered at the event included activities of the Emergency Prevention and Preparedness Response Working Group in the Arctic, the rule of law and prevention of marine pollution in the Arctic, Arctic technology and the challenges facing oil and

ABOVE: Mr Andrew Tan, Chief Executive, MPA, delivering his welcome remarks at the Norway-Singapore Arctic Symposium.

gas activities with the changing Arctic environment.

Mr Andrew Tan, Chief Executive, MPA, said in his welcome remarks: "As a maritime nation and global hub port, Singapore has been following closely the developments in Arctic shipping and its possible impact on maritime trade and the freedom of navigation. As an observer to the Arctic Council, Singapore also participates in the Arctic Council's Working Groups and shares our knowledge and experience in emergency response planning and prevention of marine oil pollution."

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Answers for industry.

## Exciting line-up at 18th SIBCON

► The biennial Singapore International Bunkering Conference and Exhibition (SIBCON) has grown from strength to strength to become the world's largest bunkering event. Now into its 18th instalment, this year's event will be held at Resorts World Sentosa from Oct 14 to 17.

Organised by the Maritime and Port Authority of Singapore (MPA), the four-day event is expected to draw over 1,600 participants from more than 50 countries. Singapore's Minister for Transport, Mr Lui Tuck Yew, will be the guest of honour at this year's SIBCON.

With a focus on cross-sector dialogue, SIBCON participants can look forward to keynote addresses by Mr Terence Yuen, Country President for BP Singapore, and Mr Jeremy Nixon, Chief Executive Officer of Global Liner Division at NYK Line, as well as gain exclusive insights from over 50 industry thought leaders.

The conference presents an excellent opportunity for all stakeholders in the industry to deliberate on changes that are afoot in the marine fuel industry, such as the potential impact that the impending global cap on sulphur limits will have on shipowners and everyone involved in the bunker supply chain, and discuss alternative fuel options.

The use of mass flow meters for bunker custody transfer will also be discussed at length during the pre-conference

symposium on Oct 14.

Besides these, there will be nine high-level roundtables covering the different aspects of the bunkering industry, from the global outlook of different fuel types to scrubber economics and technology developments to new game changers for the marine fuel industry.

Aside from regular conference events, for the first time, SIBCON participants will also be able to participate in site visits to Singapore's first liquefied natural gas terminal, as well as observe Singapore's strategy on preventing and managing oil spills during the Joint Oil Spill Exercise.

During the conference, there will be plenty of networking parties and partner programmes, including the popular VIP Lunch Tables event, which allows participants the chance to speak with prominent industry leaders like Mr Grant Hunter, Chief Officer, Legal and Contractual Affairs of the Baltic and International Maritime Council, in a relaxed lunch setting.

For more information, visit [www.sibconsingapore.com](http://www.sibconsingapore.com).

## First joint Malaysia-Singapore exercise to tackle chemical spill at sea



► To test the emergency response readiness of both Singapore's and Malaysia's agencies, the Maritime and Port Authority of Singapore (MPA) and the Malaysia Marine Department (MMD) held the first ever joint chemical spill exercise on April 9 along the Straits of Johor.

Jointly developed by MPA, MMD, National Environment Agency (NEA) and Johor Department of Environment, the Emergency Response Plan seeks to enhance the preparedness of emergency response agencies from both countries in tackling potential chemical accidents involving the seaborne transportation of hazardous chemicals in the Straits of Johor.

MPA has put in place the Chemical Contingency Plan (Marine), which covers the roles and responsibilities of responding agencies for clean-up operations, to address any

ABOVE: A vessel sprays water at the "incident site" to combat the "chemical spill".

chemical spill incidents at sea.

Highlighting the importance of regional cooperation due to the transboundary nature of incidents at sea, Mr Andrew Tan, Chief Executive, MPA, said: "Such an exercise allows us to test regional and multi-agency response capabilities so that we are ever ready and well-prepared to respond swiftly and effectively to any maritime accident, be it a collision, chemical leak or oil spill."

NEA Chief Executive Officer, Mr Ronnie Tay, said that the successful joint exercise demonstrates the operational readiness of both countries' agencies and will serve to minimise the environmental impact of any spill that may occur. He added that it also reflects the strong bilateral ties between both countries.

## Singapore is best Asian seaport for 26th time

► The Port of Singapore has once again reaffirmed its position as the top regional seaport by clinching the Best Seaport in Asia award for the 26th time, at the 28th Asian Freight and Supply Chain Awards held in Shanghai on June 17.

Mr Andrew Tan, Chief Executive, Maritime and Port Authority of Singapore, said: "Singapore is honoured to receive the Best Seaport in Asia award. We will continue to invest in infrastructure and introduce initiatives to ensure that the Port of Singapore remains a premier global hub port and a preferred port of call, and at the same time advance the cause of sustainable development."

Edging past two strong contenders, Shanghai and Shenzhen, to win the award for the 26th time was no mean feat as nominees were judged on a range of criteria, including cost competitiveness, provision of suitable container shipping-related infrastructure and the facilitation of ancillary services.

In 2013, Singapore maintained its global lead in bunker sales, with 42.7 million tonnes sold in Singapore.

It also achieved good growth in annual vessel arrival tonnage and container and cargo throughput.

Singapore is one of the top 10 ship registries in the world, with the total tonnage of ships under the Singapore Registry of Ships at 73.6 million gross tons.

## MPA and PSA extend MOU on developing container port technologies

► Research and development (R&D) efforts towards next-generation technologies for Singapore's future container terminal operations received a boost on April 11 with the Maritime and Port Authority of Singapore (MPA) and PSA Corporation Limited (PSA) signing a Memorandum of Understanding (MOU).

The MOU will extend their collaboration under the Port Technology Research and Development Programme (PTRDP) from an initial funding of S\$20 million to S\$50 million over five years. Of the additional S\$30 million, half will be funded by MPA from the Maritime Innovation and Technology Fund (MINT Fund), and the other half will be co-funded by PSA. The initial S\$20 million funding earmarked under the PTRDP since April 2011 has been committed towards research and test bedding projects such as yard crane automation and wharf automation. The extension will

allow the PTRDP to continue its focus on key areas of port automation, intelligent planning and control systems, and green port solutions.

Mr Andrew Tan, Chief Executive, MPA, said: "Through co-funding of such R&D efforts, we hope to see the adoption of new systems and technologies that will significantly enhance the competitiveness of Singapore as a global transshipment hub and bring benefits to the rest of the industry."

Added Mr Tan Puay Hin, Regional CEO for South-east Asia, PSA International: "The innovative technologies developed under the PTRDP will transform our terminal operations, and take our productivity and process efficiency to new heights."

BELOW: The MOU was signed by Mr Andrew Tan (far left), Chief Executive, MPA, and Mr Tan Puay Hin (far right), Regional CEO for South-east Asia, PSA International.



## Attracting more Singaporean tug masters

► A new training programme to attract Singaporeans into the harbour craft sector was announced by Mrs Josephine Teo, Senior Minister of State for Finance and Transport, on April 10.

This is a joint initiative by the Maritime and Port Authority of Singapore (MPA), the Singapore Workforce Development Agency (WDA) and the Employment and Employability Institute (e2i), to raise awareness on opportunities in the sector, as well as provide training for locals and skilled manpower for the industry.

Currently, there is no structured training programme for tug masters, and it takes towage companies more than two years to groom one through on the job training. To address this gap, MPA worked closely with towage service providers and training provider STET Maritime to develop a comprehensive 15-month Port Limit Tug Master Programme. The first intake, to commence in the third quarter of 2014, is expected to groom 50 tug masters over two years.

Mr Andrew Tan, Chief Executive, MPA, said: "The harbour craft sector is an important part of the maritime industry... We are pleased to work with e2i, WDA, partners from the industry and the unions, to roll out new programmes to attract more Singaporeans to the harbour craft sector."

## Reminiscing maritime heritage

► This year, the conclusion of Singapore Maritime Week saw the launch of the Singapore Maritime Trails as part of efforts to raise public awareness of Maritime Singapore.

The Singapore Maritime Trails is a series of complimentary tours around landmarks all over Singapore, and it tells the story of Singapore's evolution from a humble entrepot port to the dynamic global maritime presence it is today.

There is a treasure trove of historical facts and trivia to discover along the trails. The

first installation, the Maritime Corner@Fort Canning, was unveiled on April 11, and brings people to places like The Fullerton Hotel building, the Fullerton Waterboat House and Clifford Pier.

This segment also consists of 14 exhibition panels at Fort Canning's Raffles Terrace, placed around the restored Flagstaff and Lighthouse.

Speaking at the launch of the trails, Mr Lucien Wong, Chairman, Maritime and Port Authority of Singapore (MPA), noted that Singapore's success as a maritime nation was built on the foundation of sea trade.

He said: "The Singapore Maritime Trails are a new initiative that will enable Singaporeans and visitors alike to learn more about Singapore's maritime heritage. It is a story worth telling as it shaped our maritime nation."

Part of that history is Fort Canning Lighthouse, which operated from 1903 to 1958. In those days, it consumed around 320 litres of kerosene a month. The Lighthouse was relit for the first time in over 50 years on April 11 and now shines again, this time with solar-powered incandescent light.

"Fort Canning and its navigational structures were prominent landmarks for ships entering the harbour. Today, we have converted this special area in Fort Canning Park to share an important part of our maritime heritage," said Mr Wong.

The Fort Canning Flagstaff, which stood from as early on as 1825, has also been restored. Utilised as a means of announcing the arrival of ships, it was replaced in the 1950s by a microwave tower. The current flagstaff is a faithful replica of the wooden structure that once played such an important role in Singapore's burgeoning maritime trade.

To kick off the Maritime Trails, complimentary guided tours were held every Wednesday, Saturday and Sunday from April 12 to 30. From May, these tours will run every first Saturday of the month until the end of 2014. Interested individuals can look forward to future installations along the Singapore Maritime Trails, which will cover other important maritime landmarks.

To register for a tour or to find out more about the Singapore Maritime Trails, call 6325 5707 (Tuesdays to Sundays, 9am–5pm), or e-mail [enquiries@maritimegallery.sg](mailto:enquiries@maritimegallery.sg).



LEFT: Some of the important maritime landmarks on the Singapore Maritime Trails are located at Fort Canning Park (top) and along the Singapore River (bottom).

## MPA partners maritime companies to groom young talents



▶ As Singapore consolidates its status as a global maritime hub, the Maritime and Port Authority of Singapore (MPA) is working actively to attract passionate young talents to the industry.

Working with international maritime companies, MPA rolled out the Global Internship Award (GIA) in 2013 for students from three local universities to undergo a 10-week internship which includes an overseas stint of up to four weeks. The GIA aims to raise students' awareness of the global maritime industry and highlight its strategic importance to countries such as Singapore. From 2013, MPA has set aside S\$2 million over a five-year period for the GIA.

Said Mr Andrew Tan, Chief Executive, MPA: "To ensure the growth of our maritime sector, MPA is committed to working with our industry partners and educational institutions to

nurture passionate talent from a variety of disciplines, and encourage them to join the sector."

The first GIA award ceremony, for 23 recipients, was held on May 12. The students, from various disciplines including business, accountancy, economics and maritime studies, were selected from over 120 applications. Sixteen international maritime companies, from shipping lines to marine insurance companies, are taking part in the GIA. The programme, which started on May 19, saw the interns placed in 11 different countries across the Asia-Pacific, Europe and the Middle East, as well as the United States.

"Internship programmes are important because we need to get shipping on the radar for young talents. We want to let students see shipping as a job early in their careers," said Mr

Jakob Bergholdt, Group Vice President and CEO of NORDEN Shipping (Singapore), one of the participating companies. "Many people think that shipping is all about oil and gas and dirty jobs. In fact, the industry also encompasses other functions such as insurance and finance. So we try to correct such misconceptions by letting our interns rotate among different departments such as finance, chartering and operations, and do some real work with their mentors so they have an overview of the industry."

For ship brokerage firms like Eastport Global, which is hosting two interns this year, such internships help to raise the profile of the maritime industry, which faces a shortage of young talents.

"We get about 60 maritime graduates every year from the Nanyang Technological University (NTU). The figure for polytechnic graduates is double that. But these are not enough to meet industry demand, especially when Singapore is trying to attract more overseas companies to set up offices here," said Mr Anson Teo, Senior Manager of Corporate Development at Eastport Global.

"We want to attract more non-maritime students to join us as one need not have industry background to join ship brokerage companies like ours. We look for people who are sociable and have good EQ skills. Half of our brokers are

not from the industry."

For NTU Maritime Studies student Benita Low, 23, who interned at NORDEN last year, the GIA has helped her to make informed decisions on the area of specialisation for her career.

"I did bulk operations, bunker operations and tanker chartering, but I enjoyed chartering the most as it's very exciting to plan a journey from one point to another. I have to look into factors like weather condition and bunker opportunities, which may affect the vessel's journey and time of arrival," said Ms Low, who was later offered a two-year management trainee programme at NORDEN.

Singapore Management University business student Hans Benjamin Carter, 24, will be attached to shipping company J. Lauritzen Singapore. He said: "I'm looking forward to my overseas stint in Copenhagen, Denmark, where I will work as an operations intern doing ship chartering. No two ports are the same and being able to experience an overseas culture will enrich me individually and professionally. This internship could be an opportunity to explore it as a future career."

Business and economics student Zachary Lee, 25, from the National University of Singapore, hopes to gain hands-on experience of the inner workings of ship brokerage from his internship at Braemar Seascope.

Singapore Maritime Week (SMW) 2014 was back for its ninth run in April, offering members of the maritime community and the general public a range of 29 events comprising conferences, dialogues, forums, outreach activities and more. *Singapore Nautilus* takes a look at how the annual offering by the Maritime and Port Authority of Singapore (MPA) has continued to live up to its tagline of “People, Ideas and Opportunities”.

## PEOPLE

### SMW 2014 Exhibition



Held at VivoCity from March 31 to April 6, the SMW 2014 exhibition featured both technical aspects and fun facts about Maritime Singapore and its varied sectors, with similar satellite exhibitions held concurrently at Jurong Point and Parkway Parade. The three exhibitions drew more than 100,000 visitors over a week.

### Maritime Learning Journeys



Through SMW's Maritime Learning Journeys, some 300 people – comprising students, youths, and a select number of Facebook fans – explored the different aspects of Singapore's dynamic maritime industry. Activities included a trip out to sea, a visit to Raffles Lighthouse, as well as a tour of some port terminals around Singapore.

## Amazing Maritime Hunt



The Amazing Maritime Hunt attracted over 1,000 participants, who strategised travelling routes and gameplay in order to win the competition. The half-day event saw participants compete in eight game stations around Sentosa, Marina South Pier, and the Asian Civilisations Museum, while learning more about Maritime Singapore in the process.

## Launch of SMW 2014



SMW 2014 was officially launched by Mr Lui Tuck Yew, Minister for Transport, at VivoCity on April 6. The launch programme also included a prize-giving ceremony for winners of the Amazing Maritime Hunt and SMW Photography Competition.

## SMW Photography Competition



Budding and professional shutterbugs from Singapore were encouraged to show off their skills in the SMW Photography Competition, held from Dec 27, 2013, to Feb 28, 2014. With submissions themed around Maritime Singapore scenes, the competition saw over 900 inspiring entries from participants. Shortlisted entries were displayed at the SMW 2014 exhibition at VivoCity.

## Singapore Maritime Trail and Maritime Corner Launch



The Maritime Corner@Fort Canning was launched in style on April 11. The area around the Fort Canning Lighthouse and Flagstaff have been converted by MPA into the first of a series of maritime-related locations in and around Singapore, to make up a Maritime Trail.

## International Sportsweek for Seafarers



To promote healthy living and foster team spirit among local and foreign seafarers, MPA organises an annual International Sportsweek for Seafarers to celebrate the seafaring profession. This year, the event was held from April 9 to 12, and included telematches and basketball and football games.

# IDEAS

## Singapore Maritime Lecture and Networking Cocktail



The Singapore Maritime Lecture is an annual fixture of SMW. Organised by MPA, this year's lecture was delivered by Mr Jacques de Chateaufvieux, Chairman of BOURBON, as well as Chairman and CEO of JACCAR Holdings. This year, the Singapore Maritime Lecture was followed by a networking cocktail, which allowed members of the maritime industry to network and share ideas and experiences.

## Sustainable Marine Transportation Conference



MPA, the Royal Norwegian Embassy and Innovation Norway, with support from the Singapore Maritime Institute, the Research Council of Norway and the Norwegian Business Association of Singapore, jointly organised the Sustainable Marine Transportation Conference 2014 on April 8. The conference provided a platform for maritime leaders and experts to identify existing industry challenges and explore potential research and development opportunities.

## Singapore Bunkering Symposium



The Singapore Bunkering Symposium was held on April 8. The annual event, attended by over 400 participants, allows MPA to engage and update the bunkering industry on pertinent industry issues. This year's focus was on the implementation of the mass flow metering system.

## Automation and Autonomy



Organised by the Singapore Maritime Institute (SMI) and Ngee Ann Polytechnic, the SMI Seminar on Automation and Autonomy looked into the way forward for the industry. It explored issues such as enhancing research and development capabilities, and managing industry challenges and opportunities.

# OPPORTUNITIES

## Seatrade Asia Awards



Held on April 7 at the InterContinental Hotel Singapore, the Seatrade Asia Awards 2014 honoured the best in Asia's maritime industry. Awards were given out in various categories, including the Environment Protection Award, the Ship Owner/Operator Award, and the Seatrade Personality of the Year Award.

## TOC Container Supply Chain: Asia



The TOC Container Supply Chain: Asia conference attracted senior supply chain and logistics executives who came to learn, network and debate the latest issues on international trade, container shipping, transport logistics and port development.

## MPA Academy Certificate Presentation



Mr Andrew Tan, Chief Executive, Maritime and Port Authority of Singapore (MPA), presented certificates to the inaugural batch of trainees from MPA's Train the Trainer course, and Vessel Traffic Services Operator course in April.

## Firefighting and Incident Management Demonstration



A joint Firefighting and Incident Management demonstration was conducted by MPA and the Singapore Civil Defence Force in May. Vessels from both agencies took part in the demonstration. Equipped with oil dispersant capabilities and firefighting tools, these vessels are able to respond to fire or oil spill incidents in Singapore's waters.

## Singapore observes Day of the Seafarer



To celebrate the Day of the Seafarer, some 600 hampers were distributed to ships that call at Singapore. MPA also gave a financial grant of S\$100,000 to four seafarer missions in Singapore.

## Visit by Mayor of Rotterdam



Mr Ahmed Aboutaleb, Mayor of Rotterdam, led a delegation on a visit to MPA in June.

## Mendaki SENSE Career Talks



In May, over 500 people attended a recruitment drive and career talks for various maritime sectors at the inaugural Maritime Day 2014. The event, organised by MENDAKI SENSE and supported by MPA, was held at the open field next to Eunos MRT station. The good turnout indicated the local community's growing interest in maritime career opportunities.

# TRAIN AND GAIN

AUDRINA GAN LEARNS HOW SWIRE PACIFIC OFFSHORE IS VENTURING INTO NEW TERRITORIES WITH ITS NEW D CLASS VESSELS, WHILE MAINTAINING CONTINUOUS TRAINING.

► With its core business in anchor handling tug supply (AHTS) vessels and platform supply vessels, Swire Pacific Offshore Operations (SPO) is expanding its fleet with a new generation of deep-water anchor handlers, the D Class AHTS vessels. Built to take on more complex offshore work, the new fleet is expected to meet the growing demand for large, modern deep-water offshore support vessels.

Unlike conventional vessels, these D Class vessels are able to serve a wide range of purposes, including towing of rigs, deep-water anchor handling work, and transporting heavy equipment. Equipped with specialised tanks, they can be used to contain and transport different types of cargo, including hazardous materials such as cement, baryte, liquid mud and polluted brine, as well as liquid cargo such as fuel oil.



Due to a growth in oil and gas exploration in colder regions, the D Class vessels are designed and built to the American Bureau of Shipping Ice Class Notation C0, which allows operational flexibility when working in waters where ice may be encountered, says Robertus Achten, New Building Superintendent, SPO.

He adds: "To prevent damage during ice operations, special reinforcements have been made to the bow, mid-body and stern area in their design and construction, to ensure that these vessels are able to operate efficiently even in more extreme conditions, such as ice operations."

#### SAFETY AND SAVINGS

Each D Class vessel is also designed to ensure that deck operations can be carried out in a safe and efficient manner.

The Anchor Recovery

Frame, installed at the rear of the open deck to assist with the launch and recovery of anchors, significantly reduces the load on wires and ropes by up to 35 per cent, while ensuring safe and controlled launching of both conventional and torpedo anchors. The reduction in load also translates to significant savings in the cost of the vessel's mooring systems and load limitations.

Safety is also enhanced by the vessel's cargo rail cranes. These support anchor handling operations on board via the use of remotely operated hydraulic manipulators, reducing the amount of manual work carried out by deck officers.

SPO currently operates 84 vessels, with plans to boost its fleet to 100 by the end of 2015. Four D Class vessels are currently deployed in the Asia-Pacific by a range of companies from oil and gas

to construction contractors. Recently, SPO took delivery of *Pacific Duchess*, its latest D Class vessel, which is currently on charter in South Africa.

SPO's Managing Director, Neil Glenn, says that his company will continue to pursue contracts from Petrobras and other international operators in Brazil, particularly in higher-end markets such as advanced anchor handling services.

#### HANDS-ON TRAINING

To ensure that vessels are able to provide top-notch anchor handling services, SPO spares no effort in training its staff.

Deck officers and engineers in orange boiler suits receive anchor handling training on a simulated bridge 18m wide and 8m high at the Swire Marine Training Centre in Loyang.

Established in 2007, the facility is SPO's global training

hub. The simulator combines nautical aspects, including typical physical and mechanical conditions experienced by vessels, with full engine room operation. The simulator is equipped with a full mission bridge and engine control room, and the "outside world" is projected onto a cylindrical wall using 24 projectors and two high-quality visual systems with full 360-degree views.

During training, participants experience various scenarios on anchor handling, towing and manoeuvring procedures under very realistic circumstances. The deck and engine officers at the facility hail from around the world, bringing with them diverse expertise and talent.

This training will ensure that the highest level of operational excellence and safety are adhered to by the crew on board SPO's vessels.

## PACIFIC DUCHESS BY THE NUMBERS

92  
METRES  
LONG

22  
METRES  
WIDE

650  
SQUARE METRES  
DECK SPACE

17.5  
KNOTS  
Maximum  
Speed

6,641  
TONNES  
GROSS  
TONNAGE

1,485  
CUBIC METRES  
Dedicated Fuel  
Capacity



# MAKING THE WORLD GO ROUND



**ALYWIN CHEW** FINDS OUT HOW SEAFARERS HAVE MADE OUR DAILY LIVES EASIER, AND WHAT THE INTERNATIONAL COMMUNITY HAS DONE TO PAY TRIBUTE TO THEIR CONTRIBUTIONS.

▾ With shipping accounting for the transport of some 90 per cent of world trade, seafarers play an indispensable role in today's global economy. Today, there are some 1.5 million seafarers internationally. They work to bring goods – from food and automobiles to luxury products and more – from different parts of the world to our doorsteps.

Like the various sections of an orchestra, seafarers work closely with their crew to ensure that a voyage goes as smoothly as it can, while juggling myriad challenges such as inclement weather and the threat of piracy, as well as emotional difficulties from being apart from their loved ones for long periods of time.

#### Day of the seafarer

To recognise the contributions and sacrifices made by seafarers, the International Maritime Organization

(IMO) instituted the Day of the Seafarer in 2010 during a diplomatic conference in Manila, Philippines. It later became an annual fixture in the maritime calendar, taking place on June 25 every year.

Since its inception, the occasion has become an elaborate affair; shipping organisations and government agencies pay tribute to the vital efforts of seafarers. The occasion also serves to educate the public about the various challenges faced by these men and women at sea.

The theme for this year's Day of the Seafarer was "Seafarers brought me...". Members of the maritime community and the general public all over the world were invited to offer words of thanks to these individuals via social media, using the hashtag #thankyouseafarer.

This year, in celebration of IMO's Day of the Seafarer, the



## SEAFARER TERENCE NG WEE SIANG, 28

He followed in his father's footsteps and became a seafarer. As a Second Engineer with Pacific International Lines, he works on bulk carriers and container ships.

### WHAT DOES YOUR JOB SCOPE INCLUDE?

As a Second Engineer, I am in charge of the entire engine room and the team that runs it. I have to ensure the safety and training of the crew, and the proper maintenance of the machinery based on international regulations.

### WHAT ARE SOME OF THE CHALLENGES?

There are certain dangers present in the environment that we work in: High-speed machines which can be challenging to handle, the presence of flammable and toxic liquids, as well as the threat of falling objects or even explosions. Other challenges are more emotional in nature, and these include being away from shore for long periods of time, and the challenges of communicating with people at home when one is out at sea.

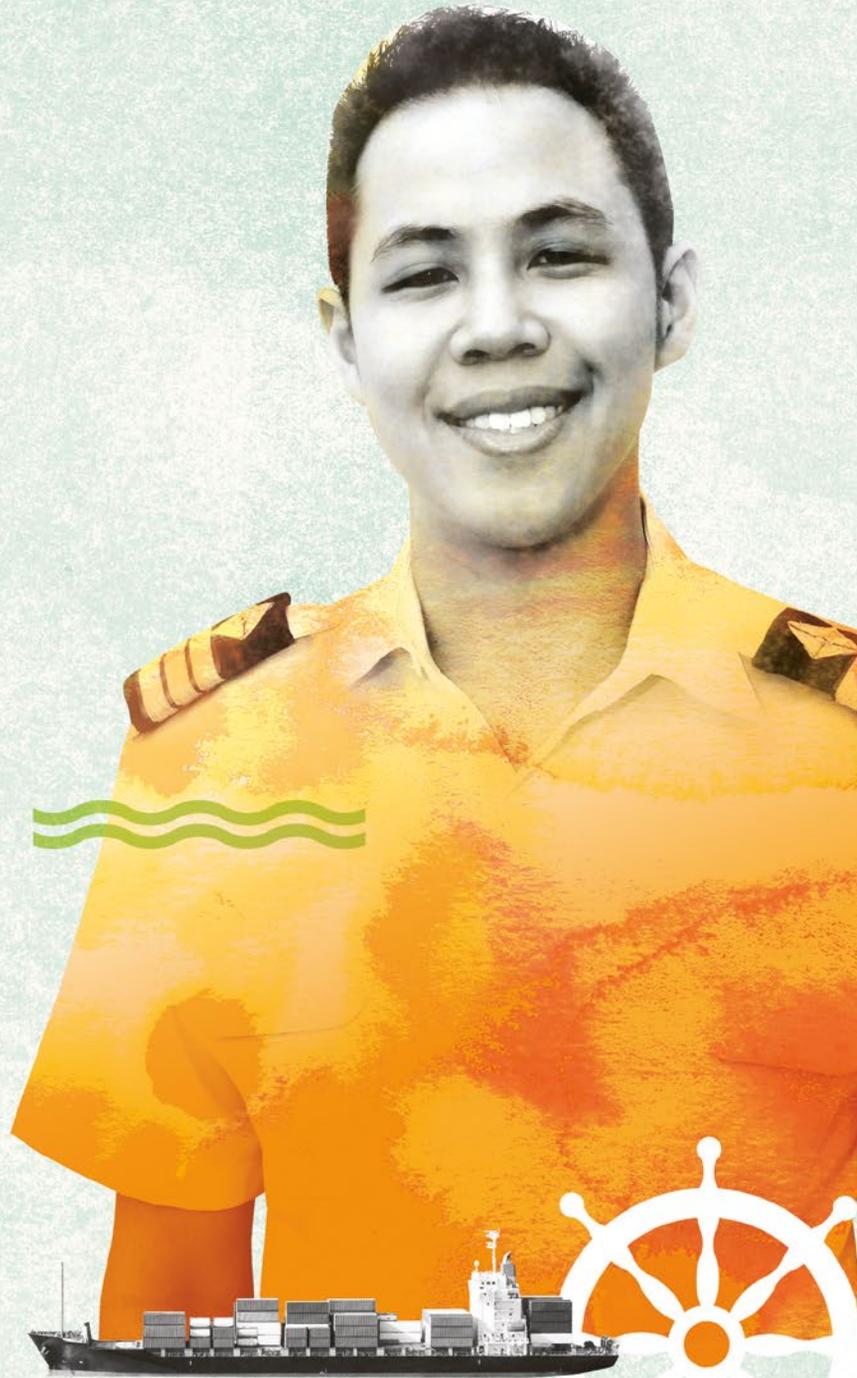
### WHAT IS IT LIKE BEING AT SEA FOR SUCH LONG PERIODS OF TIME?

I am usually away for four to six months at a time. I miss not being able to check my Facebook feed or indulging in some of my favourite foods such as bak chor mee. But being away from the comforts of home allows me to see things in a different light, and also helps me appreciate the smaller things in life.

I like spending time with my colleagues and getting to know them better. We are fortunate to work with people from all over the world, as everyone has a unique story to tell. There are endless topics to talk about and our conversations can go on for hours.

### TELL US OF AN INTERESTING EXPERIENCE OUT AT SEA.

It happened off the coast of Somalia at around 6am one New Year's Day. Our vessel was leaving the Gulf of Aden when we realised we were being chased by pirates. Fire pumps were prepared to prevent them from coming close enough to board, and the crew attempted to evade them by altering the course of the ship from port to starboard, thus creating large waves at our stern to hinder the approach of the pirates' skiffs. Although the episode lasted only 30 minutes, it felt like an eternity before we received a call from the bridge informing us that the suspicious skiffs had turned away.



## EVER WONDERED WHAT SORT OF PROFESSIONS SEAFARERS TAKE ON?

Here are a few examples:

- Ship Captain
- Nautical Officer
- Engineer
- Boatswain
- Steersman/Helmsman
- Tug Master
- Ordinary Seaman
- Motorman
- F&B caterer for crew

For more information, visit [www.maritimecareers.com.sg](http://www.maritimecareers.com.sg).

## SEAFARER TAN TECK HANG, 32

As a Chief Officer with bunker trader Sea Hub Tankers, he loves the interesting sights that come with his job on the Special Limits route.

### WHEN DID YOU BECOME A SEAFARER, AND WHAT WERE YOUR MOTIVATIONS BEHIND IT?

I joined the CoC Chief Mate (Special Limits) programme in October 2011 because I believe that the maritime industry is a vibrant one that will remain one of the core industries in Singapore.

### WHAT DOES YOUR JOB AS A CHIEF OFFICER INCLUDE?

A Chief Officer on a Singapore bunker barge is responsible for navigation, bridge watchkeeping, assisting the Captain in managing the crew, as well as keeping the ship up to date with procedures, protocols and documentation to facilitate a safer and smoother voyage.

### HOW LONG ARE YOU TYPICALLY AWAY FROM SINGAPORE FOR?

Our Special Limits vessel typically operates in local waters (up to 30 nautical miles from mainland Singapore), and I found this very appealing. Unlike my other seafaring friends who travel into foreign waters, Special Limits officers operate on a much shorter schedule.

My employer is quite flexible, and offers several different duty routines. Although most officers in the company operate on a schedule that sees them working for 40 days before getting 20 days off, it is also possible to choose shorter duty routines.

### WHAT DO YOU LIKE ABOUT YOUR JOB?

People spend loads of money to get a waterfront property or office, but my work gives me that for free. Different ports in the world have different characteristics, and Singapore's port is unique in that I get to see the city up close. The view of Singapore at night from the ship - with its skyscrapers and city lights - is really beautiful and enchanting.





Maritime and Port Authority of Singapore (MPA), along with the Singapore Maritime Officers' Union and the Singapore Organisation of Seamen, distributed 600 hampers containing food, DVDs and magazines to ships calling at Singapore, reaching out to some 9,000 seafarers.

During the hamper distribution ceremony, the guest of honour, Associate Professor Muhammad Faishal Ibrahim, Parliamentary Secretary for Health and Transport, said: "Seafaring is a challenging profession due to the nature of the job and harsh conditions at sea. Singapore is committed to addressing seafarers' welfare needs. Over the years, we have put in place various facilities, welfare programmes and year-round recreational activities for them."

#### International backing

As the ruling body for global maritime affairs, the IMO has led the way in recognising and protecting seafarers by classifying them as a special category of workers.

For instance, the IMO adopted a resolution in 1997 that focused on the human element in the maritime industry, including maritime safety, security and marine environmental protection. And in April 2006, the IMO adopted a set of guidelines for the fair treatment of seafarers should a maritime accident occur, to protect them from the different jurisdictions of waters or countries they may be in during the course of their work.

The IMO also has comprehensive guidelines aimed at providing seafarers with financial security should they be abandoned by

shipowners, and measures in place to help seafarers and their families in the unfortunate occurrence of death or injury.

The International Labour Organization further supports seafarers through the Maritime Labour Convention, 2006 (MLC, 2006), which establishes minimum working and living standards for all seafarers on ships belonging to ratifying countries. Over 60 states have ratified the MLC since its implementation in August 2013.

#### Singapore's support

The maritime community in Singapore has long recognised the crucial role that seafarers play. In 2011, Singapore became the first Asian country to ratify the MLC, demonstrating our commitment to support their needs, well-being and working conditions on board ships.

Over the years, MPA has implemented several initiatives to take care of local seafarers' welfare. For instance, Singaporean seamen who have sailed for at least 15 years and retire at 60 and above are eligible to receive the Long Service Retirement Award, which gives them up to S\$4,000 in cash. A special relief fund has also been set up to provide immediate financial assistance to the families of seafarers who have gone missing at sea. This aid is vital as there is normally a seven-year waiting period before insurers pay out claims.

Other welfare aspects that MPA covers are conciliatory services between seamen and their employers, compassionate payments in the event of the death of a seaman, repatriation of the crew, and educational grants for those looking to upgrade their qualifications.

## SEAFARER HANISAH ANGELINA VALBERG, 22

Influenced by her late father who was a deep-sea diver, she joined APL as a third officer. She dedicates this interview piece to him.

### WHY ARE YOU INTERESTED IN THE MARITIME INDUSTRY?

I grew up in a house decorated with antique diving helmets, lighthouse lamps, and a complete set of shark's teeth so big that I could fit my head in its jaws. My late father, who was a deep-sea diver at that time, loved sharing his stories with me. I was always curious about what life would be like at sea, and I wanted to see things from his perspective. When I was in secondary school, many lecturers from various polytechnics came by to conduct recruiting speeches. I still remember one speaker, Captain Frederick Francis, who caught my attention when he introduced courses offered by the Singapore Maritime Academy. I knew at once that I wanted to pursue a Diploma in Nautical Studies.

### HOW DID YOU FIND THE DIPLOMA COURSE?

I obtained my Certificate of Competency (CoC) Class 3 licence on April 25. The course turned out to be more fulfilling than I had expected. Year 1 was really fun for me, as the course was structured to prepare us for work on the seas.

We jumped off jetties and paddled together as a class to get to shore because that was one of the few practical tests that we had to pass. Years 2 and 3 were tougher as we had to prepare for the CoC Class 3 oral exams, which were quite challenging.

### ARE YOU LOOKING FORWARD TO LONG PERIODS OUT AT SEA?

Yes, I am looking forward to being at sea. I am now a third mate, and I want to work towards my goal of becoming a Master Mariner. The best part about the job is that it allows me to travel to other parts of the world for free, and experience different cultures too.

### WHAT ARE SOME OF THE CHALLENGES YOU FACE?

Some difficulties I face include odd working hours, occasional tiring manual labour, and being thousands of miles away from my loved ones. Sometimes I find it challenging to communicate with all the nationalities on board the ship as well. These are all challenges I face in this line of work, but I do try to find my own ways of taking them on.



## GET SOCIAL!

Chime in with the International Maritime Organization's celebration of the Day of the Seafarer! Say thank you to these unsung heroes through various social media platforms with the hashtag #thankyouseafarer.

Find out more on:

- Facebook [www.facebook.com/imohq](http://www.facebook.com/imohq)
- Twitter @IMOHQ
- YouTube [www.youtube.com/user/IMOHQ](http://www.youtube.com/user/IMOHQ)



### Education

MPA also supports education and training for seafarers as part of its efforts to grow the pool of quality local maritime talent for the industry.

Established in 2000, the Singapore Maritime Academy works closely with MPA to conduct Certificate of Competency (CoC) courses at Singapore Polytechnic.

These courses include a Diploma in Nautical Studies – a three-year course that prepares students in becoming an entry-level ocean-going officer – as well as a Diploma in Marine Engineering for those looking to specialise in this particular field. Students who complete these courses will receive an entry-level CoC Class 3 and CoC Class 5 respectively, both of which enable them to work on ocean-going ships.

Younger students can

look to the Tripartite Nautical Training Award, which targets N-level students. This industry-funded initiative, introduced in 2009, is a 31-month training programme that involves students going out to sea for 18 months to gain experience, as well as 13 months of classroom training. Trainees earn an entry-level CoC Class 3 upon graduation.

During the Day of the Seafarer observation this year, MPA introduced a book prize award for top students enrolled in CoC and maritime diploma courses in Singapore.

### Infrastructure

MPA also has in place quality infrastructure and services for seafarers, such as the International Drop-In Centres at various cargo terminals, including a newly opened centre at Jurong Port, where

visiting seafarers can keep in touch with their families and friends using the Internet and telephone services provided.

MPA's commitment to seafarer welfare was recognised in 2012 when the Drop-In Centre at Keppel Terminal won the Drop-In Centre of the Year award during the International Seafarers' Welfare Awards ceremony at IMO's headquarters in London.

At this year's awards, Singapore was one of five ports shortlisted for the Port of the Year award, which recognises the port that has done the most for the provision of and access to high quality welfare services and facilities for seafarers.

Through its Shipping Division and the Singapore Mariners' Club (SMC), MPA looks after the welfare of members of the mercantile marine. Seafarers of all nationalities can stay at the SMC when visiting Singapore. It is equipped with facilities such as serviced apartments, a restaurant and bar, and a medical centre.

To cater to the large number of seafarers that call at our port, the five foreign seafarers' missions in Singapore – the Danish Seamen's Church, the Norwegian Seamen's Mission, the International Lutheran Seafarers' Mission, the Stella Maris Catholic Seamen's Mission and the Mission to Seafarers – play integral roles in upholding the welfare of foreign seamen.

On this year's Day of the Seafarer, MPA continued to support the missions through an annual grant of S\$100,000, which funds various welfare services such as pastoral care, ship visitations and counselling.

MPA has also helped foster

closer ties among seafarers through the International Sportsweek for Seafarers, which pits them against one another in friendly football matches, basketball games, and other activities.

This year marks the 19th edition of the well-received annual sporting extravaganza, held during Singapore Maritime Week.

### Making the jump

Despite abundant avenues of support for seafarers by various parties, seafaring remains a demanding career.

Some seafarers do eventually make the switch from offshore posts to shore-based work for various reasons. The skills that seafarers pick up during their time at sea can turn them into highly versatile and competent professionals on shore.

Last year, recruitment service firm Faststream published a report that studied and analysed the gap between perception and reality in the maritime sector.

The report, generated from about 2,000 survey responses of maritime professionals, found that 92 per cent of those working in shore-based companies believe it is important to employ ex-seafarers with expertise in on-the-ground work. Over 1,400 respondents agreed that former seafarers generally enjoy a good transition.

The experiences of various maritime organisations, government agencies and individuals affirm the invaluable contributions from seafarers, both past and present, that keep our economies running and make our daily lives easier.



## SINGAPORE'S INITIATIVES

- First Asian country to ratify the MLC in 2011.
- Implemented several welfare schemes for local seafarers including the Long Service Retirement Award and a special relief fund for families of seafarers who have gone missing at sea.
- Provides educational grants to help seafarers improve their qualifications.
- Introduced a book prize award this year for top students enrolled in the Certificate of Competency and maritime diploma courses in Singapore.
- MPA offers training programmes such as Port Limit Steersman and Tug Master, as well as the Tripartite Maritime Scholarship Scheme.

## FORMER SEAFARER FEIZEL MOHAMMED, 40

After making the switch to shore-based work, the former second mate now uses his seafaring experience in his work at Maersk Line.

### WHY DID YOU BECOME A SEAFARER? WHAT DO YOU MISS ABOUT YOUR SEAFARING DAYS?

First of all, the wages were attractive! I also thought that seafaring would give me the opportunity to see the world, and expose me to different cultures and perspectives. After obtaining my CoC, I sailed primarily on crude oil and product tankers, and was the Second Navigation Officer on board. I miss navigating through very busy shipping lanes like the Strait of Malacca, the Singapore Strait and the Strait of Dover where you always have to be alert to your surroundings and stay focused on the task at hand.

### WHAT IS YOUR CURRENT ROLE? WHY DID YOU DECIDE TO MAKE THE SWITCH?

I am currently Head of Hub Port Management & Cargo Execution for the Asia Pacific Liner Operations Cluster at Maersk Line in Singapore. I deal with the major hub ports of Singapore, Tanjung Pelepas and Port Klang. Some of my responsibilities are day-to-day cargo management, berthing of mainline vessels, husbandry and regular interaction with our terminals. The main reason I switched from offshore to shore-based work was that I wanted to start a family.

### WAS THE TRANSITION EASY?

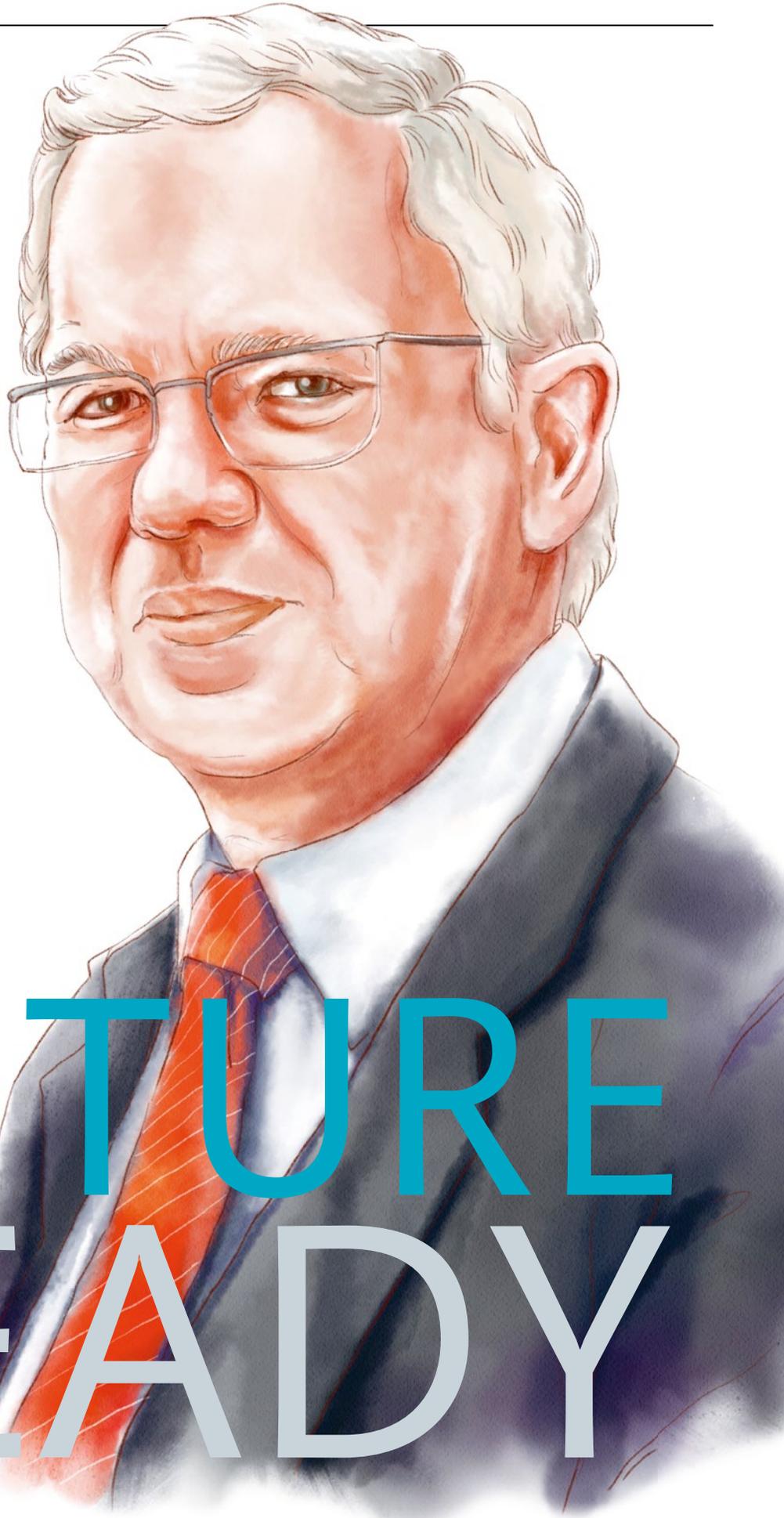
The transition was a little difficult and it took me a while to get used to it. But once I found my momentum, I never regretted my choice.

### HOW HAVE THE SKILLS YOU PICKED UP DURING YOUR SEAFARING DAYS HELPED YOUR CURRENT WORK?

My knowledge of the various ports in the world, different types of ships, and weather patterns during different times of the year have certainly helped me. All the invaluable experience I've gathered has allowed me to schedule Maersk Line's container vessels more accurately, and I am proud to contribute to Maersk Line's good reputation for schedule reliability for clients.



JACQUES DE  
CHATEAUVIEUX,  
CHAIRMAN OF  
BOURBON AND  
CHAIRMAN AND CEO  
OF JACCAR HOLDINGS,  
SHARES HIS INSIGHTS  
AND OUTLOOK  
ON THE MARITIME  
INDUSTRY.



FUTURE  
READY

📍 Jacques de Chateauvieux, Chairman of BOURBON and Chairman and CEO of JACCAR Holdings, delivered the Singapore Maritime Lecture during Singapore Maritime Week (SMW) on April 9, where he spoke candidly on the topic, "Can we create value in shipping? Why or why not?"

*Singapore Nautilus* speaks to him about his experience working in the maritime sector, as well as his thoughts on future developments within the industry.

### Your organisation holds a lot of maritime-related interests. What, to you, are some of the most fascinating aspects of the maritime industry?

Our marine business, through BOURBON and the bulk and gas activities of Greenship Holdings, provides services to industrial customers. We may be a small portion of their costs or operations, but that part is often critical to their efficiency in logistics and the safety of their operation. We like this business-to-business format where each party shares the same expectations and develops trust over time through reliability.

Besides, maritime work involves women and men who are fully empowered and responsible, with a deep sense of their mission, and who genuinely practise active solidarity. Those shared values, onshore and offshore, make this industry very humane – one unique aspect it has had for centuries.

### What are you busy with these days?

We are after the full satisfaction of our customers in many aspects. Offshore, oil and gas companies put safety as their top priority. Achieving the zero-accident target is a question of behaviour and proper investment strategy. We do so through consistently putting safety as our main priority, like with the Safety Takes Me Home campaign, and cooperating with our customers whose performances in the field also rely on our own.

But safety, as well as operational excellence, is also a function of our fleet

and investment strategy. Building in series, using simulation for crew training, locating spare parts in selected repair centres, centralising maintenance management, and getting everyone engaged to deliver – all these translate into a reliable fleet for safe operations.

In the shipping sector, we focus on green design and operations to reduce emissions and fuel costs. This means working ahead by ordering vessels with the best possible design and operating the vessels ourselves to keep the benefits of such strategy in-house.

### You are known to be quite the entrepreneur, with a diversified portfolio of equity interests. What is your business philosophy?

Businesses arise because of change and asymmetry. Change can come via customers' expectations or through the ways and means used to satisfy a given customer's needs. Change also comes via new products, by introducing something totally new, or in new ways of doing things – deconstruction and reconstruction are well explained as destructive creation. It requires an ability to listen, as well as imagination or analogic reasoning, and also humility to consider that reality is what we see, not what we think, coupled with the proactive will to make it happen.

**"I see this as a new chapter of a success story where the focus is on building a comprehensive offer...in anticipation of the expected boom in inter-regional trade in Asia..."**

Jacques de Chateauvieux, Chairman of BOURBON and Chairman and CEO of JACCAR Holdings, on Maritime Singapore

We want to grow, therefore we are ready to go through the processes and have the attitude described above, with agility. But we also believe that it is only worthwhile if it creates value on both the human and economic levels, and because value stems from asymmetry, we are ready to act as contrarians.

### What are some maritime-related areas that you foresee as worthwhile future investments, and why?

There is probably more than one answer to this question. Our focus today is on being prepared to service the needs of transportation and floating units within the liquefied natural gas and gas sector.

As a consequence of the changing patterns of gas exports and imports, as well as of gas price differentials in the world – the shale fields' development being at the heart of this – we believe that appropriate transport solutions have to be developed, and we want to be ready for that with proper designs in each segment of the market.

### Tell us about the focus of your Singapore Maritime Lecture. Why were those topics important to you? What was your main takeaway from your visit to Singapore?

This time, the lecture was about making money in shipping. The central idea was that money in shipping comes from operations and the trading of vessels over time. The two main criteria seem to be value to size within each segment and the true ability to differentiate (from the pack). At the end of this review, it appears that each of the four segments has its own dynamic in terms of value creation, no matter what you think.

As far as Maritime Singapore is concerned, I see this as a new chapter of a success story where the focus is on building a comprehensive offer, both in terms of infrastructure and software for services, in anticipation of the expected boom in inter-regional trade in Asia, with the triangle of India, Indonesia and China.

# SHINING LIGHT ON MARITIME ARBITRATION

TEH JOO LIN FINDS OUT HOW THE SINGAPORE CHAMBER OF MARITIME ARBITRATION OVERCAME A DECADE OF CHALLENGES TO BECOME A LEADING INTERNATIONAL BODY IN ARBITRATING MARITIME DISPUTES.

► When Lee Wai Pong took over as the executive director of the Singapore Chamber of Maritime Arbitration (SCMA) in 2010, the organisation had just undergone a reconstitution in 2009, following a period of uncertainty about the future and low number of requests for its services since its

incorporation in 2004.

A fundamental change in its arbitration model, accompanied by a fresh set of procedural rules, and its operating model as a chamber, turned things around. Today, Singapore is one of the world's top venues for the arbitration of maritime disputes.

The numbers speak for themselves. Over five years from 2009 to 2013, SCMA received 83 cases, involving both domestic and international parties, for arbitration. That's a far cry from the four cases it handled during its first five years.

One case last year involved

claims worth a total of S\$250 million – the largest in the chamber's 10-year history. Lee says: "Every day, I get calls from people asking how to make use of our clauses or how to invoke various aspects of our clauses."

Contracting parties can insert arbitration clauses into their agreements. These

clauses require them to resolve any future disputes through arbitration, where an impartial tribunal of one or more arbitrators privately resolves any disputes. In some cases, especially those involving cross-border transactions, arbitration is seen as cheaper and faster than taking a dispute to court, which may also attract unwanted publicity.

"We've enjoyed success beyond some of our dreams," says Lee, an arbitrator and master mariner with four decades of experience in shipping. As of end May 2014, SCMA had already received more requests for arbitration this year than it had in the whole of 2013.

The initial low demand, followed by a rise in cases, says Lee, could have been because it usually takes time for a new service to start gaining demand. But, he believes, it is more likely the result of the deliberate changes effected by SCMA.

### Unmanaging arbitration

A key factor was the remodelling of SCMA's arbitration framework to better suit the purposes of the maritime community. Lee says: "It was a brave decision. We altered course by 180 degrees."

SCMA used to follow the International Chamber of Commerce model, in which the arbitration body actively administers the arbitration process. However, this proved unpopular with the maritime community. So in 2009, SCMA's rules were revamped to follow a procedural model comparable to the

London Maritime Arbitrators Association, whose process is un-administered.

This works better for the maritime community as disputes often concern events that have already run their courses; in contrast to other industries such as construction where a quick resolution to any dispute arising from the contract is desired in order for work to continue.

In any case, some members of the maritime community view the serving of an arbitral notice as a shot across the bow – a tactic to get the other party to come to the table and negotiate a settlement.

"But they don't want the so-called warning shot to cost too much as the intention is to get the counterparty to come to the table," says Lee.

Despite the adoption of an un-administered model,

parties can still rely on SCMA to provide some light-touch assistance to speed along the arbitration processes.

The Chamber boasts a strong panel of 65 arbitrators, all of whom have documented experience and expertise in maritime areas such as navigation, chartering and shipbroking. They include eminent commercial men (individuals with substantial, practical, commercial experience), lawyers and former judges. Parties seeking arbitration are free to look beyond this list.

### Asia's top choice

SCMA has been reaping the fruits of its efforts to raise awareness of maritime arbitration and promote Singapore as Asia's preferred seat of arbitration.

The Baltic and International

Maritime Council (BIMCO), an international shipping association that, among other things, develops standard contracts and clauses, included Singapore as a third arbitration venue – after New York and London – in all its standard forms in 2012.

Lee says that this seminal shift bodes well for Singapore's growing importance as a maritime arbitration hub in Asia – a continent with a high share of world tonnage and cargo importers and exporters. He adds: "This has tremendous implications because the centre of gravity of the shipping industry has, for a long time now, shifted to the Asia-Pacific. Concurrent with that, we have not had a seat based in Asia.

"With BIMCO's decision, Asia-Pacific nations can take comfort that they now have their own seat of arbitration at their doorsteps and it will be in our future interests to promote Singapore as a good seat and to better assist our stakeholders in Asia to take ownership of this development."

Lee adds that Singapore checks all the right boxes for various reasons. He says: "One fact that supports Singapore as a seat of arbitration is our concentration of maritime expertise. We have more than 170,000 people working



TOP: SCMA is located at Maxwell Chambers, the world's first integrated dispute resolution complex.

BOTTOM: The exclusive Arbitrators' Lounge provides complimentary refreshments and reading materials.



## BY THE NUMBERS

within the sector. There is a big concentration of core competencies representing many, many diverse aspects of maritime commerce, so we are not one-dimensional in that sense.

“We have a huge base of complementary expertise such as commercial men, technical experts, learned academics and experienced insurers right at our doorstep to support our maritime lawyers and maritime arbitrations. All these make us unique.”

The other positive aspect is the Government’s support for the development of arbitration, he adds. Some examples: Maxwell Chambers provides state-of-the-art, world-class infrastructure for the conduct of arbitrations. Arbitration legislation is regularly reviewed to keep them current and foreign arbitrators receive tax and work permit exemptions when they arbitrate here.

The international maritime community seems to agree. There appears to be growing adoption of a clause in contracts to arbitrate maritime disputes in Singapore. Indicative of the popularity of SCMA’s framework is the fact that some of its cases are not even strictly maritime disputes.

Membership of SCMA has also doubled to 185 in the past five years.

### Arbitration conference

To promote its work, SCMA regularly organises and supports events that further the understanding of its role, such as the inaugural Asian Maritime Law & Arbitration Conference held in April this

ESTABLISHED IN

2004



83

Cases

FROM 2009 TO 2013



185

MEMBERS

RECONSTITUTED IN

2009



BIGGEST CLAIM

S\$250m



65

Arbitrators

year. Prominent lawyers and arbitrators flew in from all over the world for the two-day conference, co-hosted by SCMA and the Maritime Law Association of Singapore.

Event participants examined topics relating to law and arbitration that typically arise in the different stages of a ship’s lifespan, through panel discussions, skits, and mock hearings. Justice Quentin Loh of the Singapore Supreme Court graced the occasion by presiding over a mock hearing, and chairing the closing session featuring a panel discussion by international experts on the future of Singapore maritime arbitration.

SCMA is currently studying the option of incorporating mediation into the arbitration process through a hybrid form sometimes termed Arb-Med-Arb. Lee says: “Through a process of sustainable and continuing innovation, Singapore has demonstrated that it is a great focal point for the ongoing development of maritime arbitration.

“Stakeholders can look to us for thought leadership to stay relevant in ever-changing environments. It remains SCMA’s goal to see increasing numbers of contracting parties accept Singapore as a credible seat of choice that’s backed up by substantive value propositions.”

[www.scma.org.sg](http://www.scma.org.sg)

TOP: The Cavenagh Room is one of several custom-designed hearing rooms at Maxwell Chambers.

BOTTOM: SCMA is housed in a refurbished conservation building.

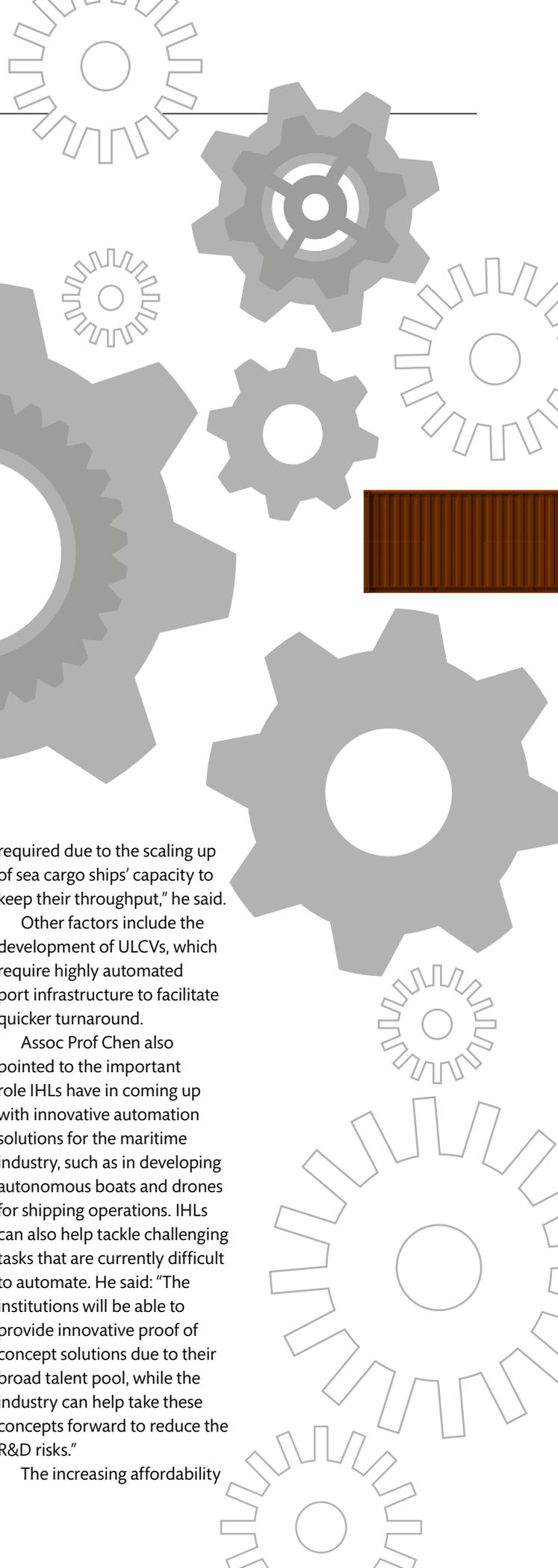


THE NEXT

LEAP

VINCENT WEE LOOKS AT SOME EXCITING NEW TECHNOLOGIES IN AUTOMATION AND AUTONOMY THAT WILL SHAPE THE FUTURE OF THE MARITIME SECTOR.

FORWARD



► The future of Singapore's maritime sector lies in its ability to retain its competitive edge through constant innovation to stay on top of technological advances in the industry.

There is a strong emphasis on cooperation among various stakeholders, from government agencies to companies to tertiary institutions, to grow maritime research and development (R&D) capabilities and develop next-generation technologies in port and maritime operations.

The growth in demand of ultra large container vessels (ULCVs), which require more robust infrastructure to handle larger cargo volume and deliver faster turnaround, has also made the drive towards greater automation in port operations more pressing.

Recognising these challenges, the Singapore Maritime Institute (SMI) made automation and autonomy the focus of a seminar held in April 2014. These two elements are critical for higher operational efficiency and better reliability. They also provide practical solutions to the challenges of skilled labour shortage and the need for improved productivity and to minimise human error.

**Developing capabilities**

Institutes of higher learning

(IHLs) and R&D bodies research and develop innovative technology for application in areas such as ports, shipping and shipyards, as shared during the SMI seminar held on April 11 at the PSA Building Auditorium.

Jointly organised by SMI and the Maritime Institute @ Ngee Ann Polytechnic, the seminar brought together industry professionals and academics, providing a platform for them to interact and identify existing industry challenges and R&D opportunities. For Associate Professor Chen I-Ming from Nanyang Technological University's (NTU) School of Mechanical and Aerospace Engineering, automation is the way forward for the maritime industry, to address challenges relating to port productivity and efficiency.

"Automation technology is

required due to the scaling up of sea cargo ships' capacity to keep their throughput," he said.

Other factors include the development of ULCVs, which require highly automated port infrastructure to facilitate quicker turnaround.

Assoc Prof Chen also pointed to the important role IHLs have in coming up with innovative automation solutions for the maritime industry, such as in developing autonomous boats and drones for shipping operations. IHLs can also help tackle challenging tasks that are currently difficult to automate. He said: "The institutions will be able to provide innovative proof of concept solutions due to their broad talent pool, while the industry can help take these concepts forward to reduce the R&D risks."

The increasing affordability

## Automation technology and autonomous machines will continue to evolve and will eventually become an integral part of the port of the future.

of automation and robotics equipment, also makes maritime automation economically justifiable, added Assoc Prof Chen.

### Automating operations

Among the topics covered at the seminar were several concepts for automating port operations and for autonomous marine operations and systems. These revolved mainly around applications for container terminals, which are a key component of Singapore's maritime industry.

One thing that is apparent from the seminar is that automation technology and autonomous machines will continue to evolve and will eventually become an integral part of the port of the future. These technologies can also be applied to help shipyards and equipment manufacturers improve productivity, product reliability and workplace safety.

### Challenges and solutions

The presenters were also clear about the challenges they faced, and the potential solutions. Associate Professor Lee Loo Hay from the National

University of Singapore's (NUS) Department of Industrial and Systems Engineering compared various automation systems already in use in various ports, including each one's advantages and drawbacks. For instance, while automated container terminals provide flexibility, they are also costly and require large land area. His solution to these problems was the Sustainable Integrated Next Generation Advanced (SINGA) Port concept, which won the US\$1 million prize at the Next Generation Container Port Challenge last year. The concept was jointly created by NUS, Shanghai Maritime University, and port equipment maker Shanghai Zhenhua Heavy Industries.

The SINGA Port concept of a two-storey stacking yard addresses Singapore's land scarcity issue, while shortening the time spent transporting containers over a sprawling yard space. Building a stacking yard over two floors also cuts down on the time spent reshuffling containers stacked in the wrong order – a problem unique to Singapore, as it is a trans-shipment port where a

majority of the containers that arrive are re-exported to other destinations.

### Using robots

Another major theme was the use of robotics and remote sensors in routine operations, and the use of technology to better track containers and improve workflow. Currently, some ports and container terminals use robotics like automated guided vehicles and automated stacking cranes. But there is room for growth in the use of such technology in port and maritime operations.

Ngee Ann Polytechnic's Kwee Tiaw Joo, from the Marine and Offshore Technology Centre of Innovation, has done much work in this area, especially in the use of 3-D technology in the port environment. He has found that using various types of 3-D equipment, such as long-range scanners, can streamline work processes and improve efficiency while also enhancing safety and promoting closer collaboration between machines and their human operators.

When it came down to actual port operations, robots were seen as the way forward. Dr Zhang Liandong from Singapore Polytechnic's Advanced Robotics and Intelligent Control Centre presented a solution to provide mobile manipulation for the coning and deconing of containers. His research found that the task of twist-lock coning and deconing is non-trivial and a point of congestion towards greater

automation in port operations. At the seminar, he proposed the use of autonomous mobile manipulators for automatic twist-lock coning and deconing to address the issue.

Finally, NTU's Assoc Prof Chen highlighted more high level extrapolations of the use of technology. Among the most exciting, new and upcoming automation and autonomous technologies he discussed was the application of human-centric automation technology for highly sophisticated tasks currently done only by humans, such as rod lashing, twist-locking, coning and mooring. He sees potential in employing cable-driven robotic systems to carry out such tasks.

Assoc Prof Chen also touched on the use of robots or unmanned devices to complete certain hazardous or routine tasks. These include using human-like robotic divers to replace real human divers, in autonomous vehicles, cranes or machines in ports, as well as to operate autonomous sailing and group sailing of fleets of cargo ships at sea.

He acknowledged, though, that the maritime industry still faces challenges in adopting and adapting robotic technology. The biggest challenges he identified included regulations on operations and operators, and resistance from current workers. He also pointed out that the adoption of these new technologies is a long-term goal that will take five to 10 years to achieve, rather than something that can take place in the immediate future.

● To offshore support vessel (OSV) operator PACC Offshore Services Holdings (POSH), the increase in investments in new offshore oil fields is good news. Due to growing energy demand and the external quest for energy security, capital expenditure for the development of offshore oil and gas fields is projected to increase at more than 10 per cent per annum until 2017. Exploration and production activity is growing, especially in Asia, Africa and Latin America.

And POSH is poised to move into these new areas, targeting the niche walk-to-work (W2W) segment by providing vessels that transport and accommodate maintenance personnel for offshore installations. These vessels allow the personnel to “walk to work” via gangways.

POSH’s CEO and Executive Director, Captain Gerald Seow, says: “The development of these new offshore oil fields has grown rapidly. At the same time, the structures of the older

ones require maintenance and upgrading, thus driving demand for W2W assets.

“New technologies for Enhanced Oil Recovery methods (techniques to increase the amount of crude oil extracted) will also increase demand for specialised assets, and further drive growth in the OSV industry.”

#### Strength to strength

POSH’s latest move is possible due to its sound foundation. The recently listed company has experienced steady growth since its incorporation.

In 2006, Pacific Carriers Limited (Kuok Group’s shipping arm) diversified into the offshore oil and gas services sector by incorporating POSH and placing orders for anchor handling tug supply (AHTS) vessels for the deep-water segment.

The following year, POSH set its sights on PSA Marine’s offshore business arm, one of Asia’s leading transportation and installation operators at



# BUILDING ON CAPABILITIES

A DIVERSE FLEET AND STRONG TEAM HAVE ALLOWED OFFSHORE SUPPORT VESSEL OPERATOR POSH TO VENTURE INTO NEW FRONTIERS. BY **DESMOND NG**

## POSH MILESTONES

- 2007** Acquired PSA Marine's offshore business.
- 2008** Ventured into offshore accommodation segment with the conversion of three container ships into two 191-man and one 197-man accommodation vessels.
- 2010** Formed a platform supply vessel (PSV) fleet with the acquisition of eight PSVs.
- 2013** Awarded the contract for the transport and installation of Ichthys' Floating Production, Storage and Offloading Units, and Central Processing Facility, which will be the largest such facility installed to date when completed.
- 2014** Semi-submersible accommodation vessel *POSH Xanadu* (under construction) is awarded a US\$80.5 million (S\$99.7 million) one-year contract by Petrobras (starting in December).



the time. POSH subsequently acquired PSA Marine, and integrated both businesses.

Today, POSH operates globally. It is the largest Asia-based operator and the fifth largest in the world, based on fleet size.

The company has about 280 onshore employees worldwide and, as of last year, a fleet of 112 vessels (including those from joint ventures) such as AHTS vessels, towing tugs and barges.

"POSH's strong growth over

the years can be attributed to the nature of our highly diversified fleet, which is able to service a wide range of offshore oil and gas exploration activities," says Capt Seow.

Despite its global reach, POSH, a home-grown company, continues to be headquartered in Singapore. This is intentional.

Says Capt Seow: "Our business had its beginnings in Singapore, a maritime hub with robust infrastructure to support our business."

### Comprehensive solutions

The company, which launched its initial public offering in April, also prides itself on having a management team with varied backgrounds.

Its staff is able to tap on POSH's large and diversified fleet and effectively cross-sell the services of each of its four divisions – OSVs, Transportation and Installation, Floatel, and Harbour Services and Emergency Response – by offering comprehensive solutions that set them apart from their competitors.

Capt Seow says: "We are lucky to have a highly experienced and committed management team with a proven international track record, to continue moving us forward.

"With our staff's invaluable experience, we are able to make full use of our large and diverse fleet to provide value-added services and comprehensive solutions to our customers.

"We are also able to leverage on our multi-segment offshore capabilities to secure contracts that might not be available to a single service provider."

### Challenges

On challenges in the near future, Capt Seow points out that the container and bulk-shipping markets are suffering from oversupply problems, caused by the presence of speculative investors with readily available funding in the market.

"It's also possible that these investors will flood into the OSV market and create a similar oversupply situation.

Although the offshore services industry is less affected, speculative asset investors can still seek opportunities in this business, leading to oversupply," he says.

Helping to counter this problem of oversupply is the fact that barriers to entry to the OSV market are high, given that OSV operations are more complex than merchant shipping operations, and OSV clients have much higher expectations than those in merchant shipping.

He adds: "It is critical that we anticipate the market and invest wisely in assets, and continue to upgrade the competency of our people."

### New ventures

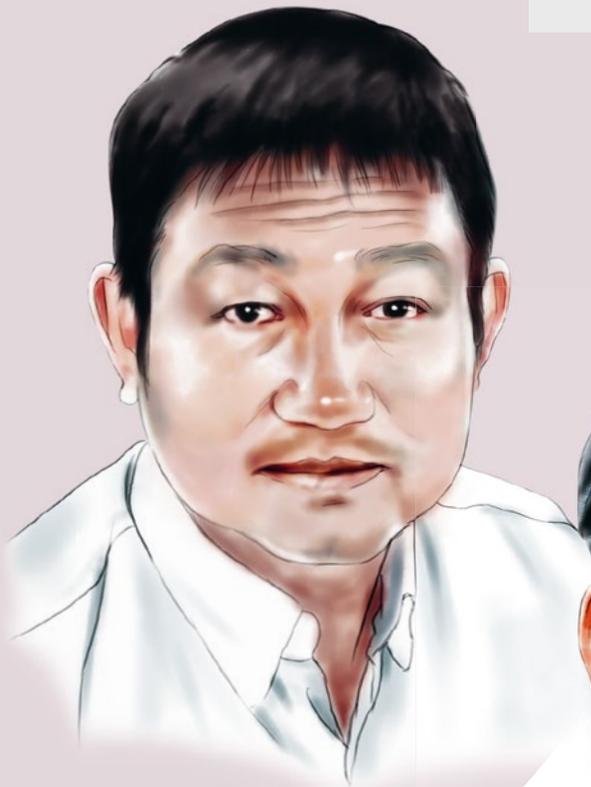
POSH plans to develop its offshore maintenance and W2W accommodation segments, like the *POSH Xanadu* and the *POSH Arcadia* – these are two of the world's largest dynamic positioning class 3 (DP 3), semi-submersible accommodation vessels.

These vessels provide comfortable accommodation on a very stable platform with welfare amenities, and can stay connected to offshore structures without anchoring, allowing oil field workers to walk to work. They are also a safe haven to evacuate to in case of any danger.

POSH has already made some progress in these segments – it announced in May that it had been awarded a one-year contract by Petrobras worth US\$80.5 million (S\$99.7 million) in the W2W market.

# EMBRACING CHANGE

AS THE WORLD'S TOP BUNKERING PORT, SINGAPORE IS LEADING THE WAY WITH THE MANDATORY USE OF MASS FLOW METERS FOR BUNKERING BY 2017. **VINCENT WEE** SPEAKS WITH SEVERAL INDUSTRY PLAYERS ABOUT THEIR VIEWS.



Ju Kai Meng



Captain Yoon Peng Kwan

Douglas Raitt



Dr Parry Oei



FROM LEFT: Ju Kai Meng, Managing Director, Sinanju Tankers; Captain Yoon Peng Kwan, Fleet Support General Manager, Pacific International Lines; Douglas Raitt, Global Fuel Oil Bunkering Analysis and Advisory Service Manager, Lloyd's Register; and Dr Parry Oei, Director, Port Services Division, Maritime and Port Authority of Singapore.

**SINGAPORE NAUTILUS (SN):** How well prepared is the industry for this move? What has been the reaction so far?

**DR PARRY OEI (PO):** Prior to making mass flow meters mandatory for bunkering, a Working Group was jointly initiated by the Maritime and Port Authority of Singapore (MPA) and SPRING Singapore in 2009 to develop and validate the use of mass flow metering for bunkering in Singapore.

Since 2011, the Working Group, comprising various experts and stakeholders from the industry including

MPA, bunker suppliers, bunker tanker operators, meter vendors, representatives from international shipping companies and bunker surveyors, has conducted extensive trials using the mass flow meter system.

The first commercial bunker delivery in Singapore using the mass flow meter system took place in July 2012, and was well received by industry stakeholders.

Since 2012, MPA has also developed an industry guide for the use of the mass flow meter system.

Additionally, MPA has undertaken close consultation with the industry through the Singapore Shipping Association and the International Bunker Industry Association in implementing the mandatory mass flow metering system, and many of their members are supportive.

**DOUGLAS RAITT (DR):** Mass flow metering will be a step change in efficiency, accuracy and transparency for the bunker industry.

Currently, the process of dipping tanks and measuring temperatures and volume to

convert to mass calculations are prone to variances, leading to inaccurate determination of quantity, which results in potential disputes.

The enforcement of mass flow metering, as part of the bunker delivery process, will ensure that customers receive the quantity of bunkers they have purchased.

Of course, as with all new technologies, there will be some resistance to a move from the status quo, but with proper edification of all stakeholders in the supply chain, I am confident that the

industry will see the long term benefits of embracing new technology, such as mass flow metering.

**JU KAI MENG (JKM):** Initially, it was a bit of a challenge to do the meter installation. As we moved along and learned more, we realised that nothing is impossible. It always requires effort to try and learn new technology. As far as we are concerned, the industry acceptance has been positive.

**CAPTAIN YOON PENG KWAN (YPK):** The use of mass flow meters is not new to us. Pacific International Lines was the first container ship operator in the Asia-Pacific to adopt such technology after the industry pioneer, Maersk. We installed the technology on our new build ships in 2011 for accurate tracking of bunker transfers and main engines' consumption.

The mandatory use of mass flow meters gives customers confidence in receiving the quantity ordered, and increases the level of trust between fuel suppliers and their customers.

**SN: How will the move impact the industry? What are the benefits?**

**PO:** It sets a new benchmark for bunkering practices worldwide. The mass flow meter system will not only enhance transparency in the bunkering process, but also improve operational efficiency, increase the productivity of the entire industry, and minimise illegal bunkering activities.

The adoption of mass flow meters for bunkering will also provide better assurance to both bunker buyers and



suppliers on the quantity of bunkers delivered.

**DR:** Ultimately, the use of mass flow metering will result in a smoother bunker transaction landscape with less commercial disputes, shorter bunker delivery times and a simpler custody transfer process. Each bunker stem represents hundreds of thousands or even millions of dollars, and the ability to measure this accurately should be viewed as a clear indication to anybody in the maritime and bunker industries of the need for a step change in efficiency and transparency.

**JKM:** I believe there will be some challenges in the

beginning, as with the adoption of any new initiative, but I am confident that this will be ironed out and resolved. I think it will take time for the bunker market to stabilise and accept this new approach.

**YPK:** We feel the use of mass flow meters for bunkering will improve the turnaround of our vessels in Singapore. The problematic manual processes are no longer needed, mitigating both human and system errors. This results in a faster and smoother bunker delivery process.

Currently, about 80 per cent of our total bunkers consumed are lifted in Singapore. We have about seven to eight vessels calling at Singapore on a single day. The use of mass flow meters has been shown to shorten each bunker delivery by as much as three hours.

This significant reduction in time impacts our bottom line. Bunker cost makes up about 40 per cent of our total operating costs. A quicker turnaround of our vessels in Singapore will help with the overall energy management of our fleet of vessels.

**SN: Do you anticipate any problems ahead with full implementation? If so, how can we resolve them?**

**PO:** MPA has been actively encouraging the adoption of mass flow meters in the bunkering industry for several years. Given the adequate lead-time between the announcement and the implementation of the mandatory mass flow metering system, there should not be major problems.

Also, to help the industry offset a portion of the cost of adopting the mass flow meter system, MPA is offering a lump sum incentive of S\$80,000 for each existing bunker tanker delivering marine fuel oil in Singapore. The incentive will be given out upon MPA's approval of each fitted mass flow meter system.

**DR:** The largest group of concerned stakeholders in the industry appears to be the bunker surveying community, as they believe their work and business may be affected in the future.

I firmly believe, as do others in the bunker industry, including mass flow meter vendors, that there will still be a significant role for surveyors in the brave new world of mass flow metering, albeit in a different guise.

Examples of mass flow meter-related tasks that surveyors will have to undertake include, but are not limited to, the checking of seal integrity on the mass flow metering system against the seal certificate on board barges, and the verification of calibration records to ensure that they are up to date with the systems.

The bunker survey industry is currently working on developing a standard operating procedure for surveyors working with mass flow meter vendors and MPA in order for bunker surveyors to be ready for the technology.

Ultimately, surveyors who are prepared to upgrade their skills and work effectively with new technology should not be affected by the introduction of

## “I am confident that the industry will see the long term benefits of embracing new technology, such as mass flow metering.”

Douglas Raitt, Global Fuel Oil Bunkering Analysis and Advisory Service Manager, Lloyd's Register

mandatory mass flow metering in Singapore.

I am confident it will be an exciting and busy future for the survey community working in harmony with mass flow meters on barges in Singapore.

**JKM:** Generally, there should not be any issues with full implementation. However, I feel that there should be a proper guide, with information on the use of mass flow meters, in place as soon as possible. As we move along, just like with bunkering standard SS 600, we will need to continue fine-tuning the procedures accordingly.

**YPK:** We expect a smooth transition because adequate time has been given to industry players to adopt the new scheme.

MPA has put in place a detailed programme and incentive scheme to ensure a seamless phasing-in of the mass flow meter system. Bunker surveyors will have to be re-trained to handle custody transfers based on the new scheme.

As with all new technology, a greater level of skills and expertise will be required. Shipowners and operators will have to familiarise themselves with the new mass flow metering procedure.

**SN: What will this move do for Singapore's leadership role in the shipping community?**

**PO:** The mandatory use of mass flow meters in bunkering will safeguard Singapore's reputation as the world's top bunkering port, and strengthen our position in the long term as a reliable and trusted port for bunkering operations.

**DR:** I believe Singapore is yet again proving itself to be a true leader in the bunkering industry. We are well aware of the exemplary work done through the development of bunkering standards, such as SS 600, in Singapore over the years, which has served as a blueprint for local and global bunker industry best practices.

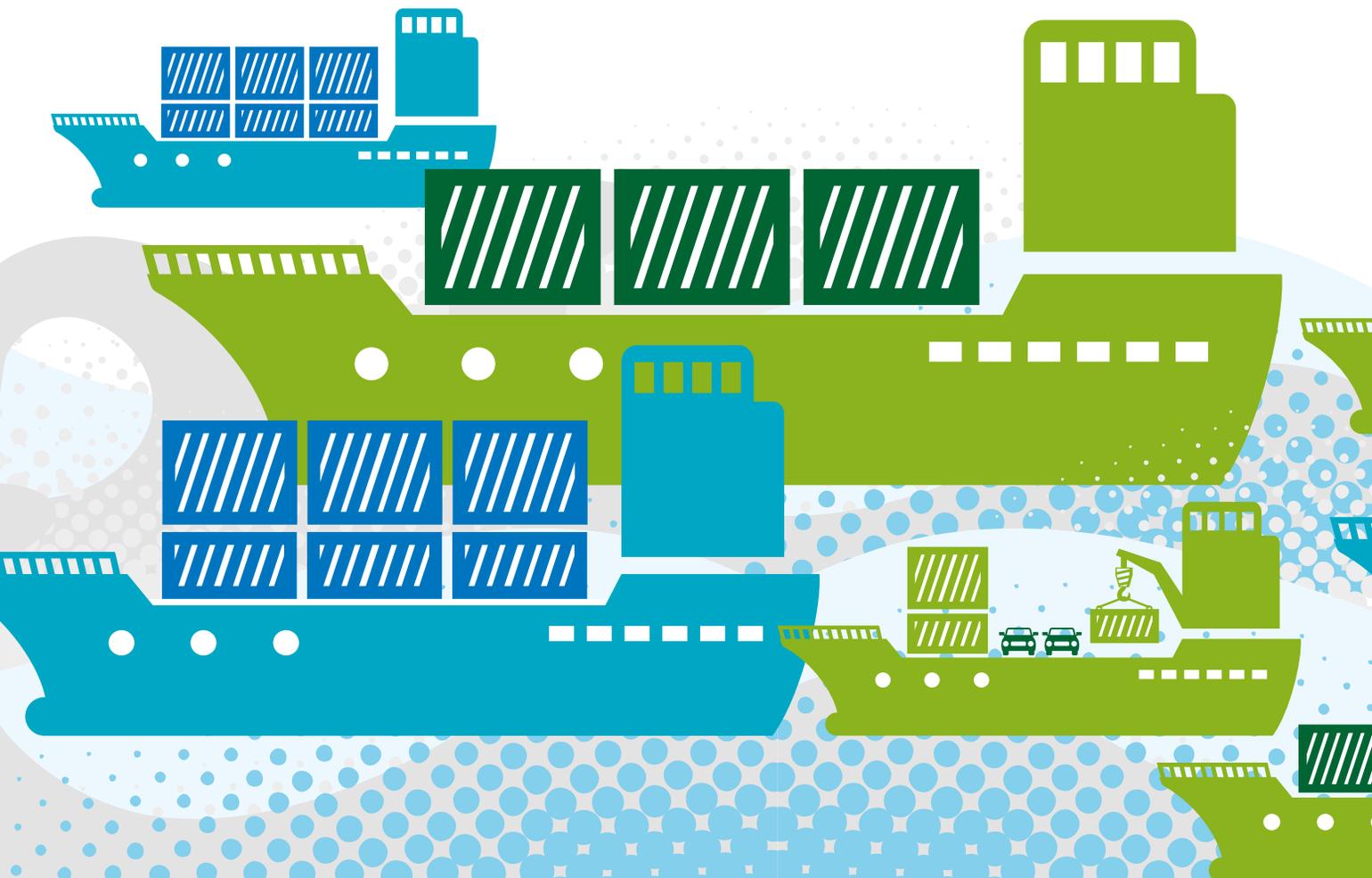
By embracing new technology, such as mass flow metering, the port is making a further step change in efficiency and transparency.

The international shipping community, who are battling ever-rising bunker prices globally, can only view this positively. Hence, the ability to improve transparency through the mandatory use of mass flow meters will not only be expected, but also demanded.

**YPK:** By embracing technology and innovation, this move will enhance Singapore's position as a leading bunkering port.

WITH CONTAINER SHIPS GROWING RAPIDLY IN SIZE OVER THE YEARS, **JUST BERGMANN**, DNV GL'S CONTAINER SHIP BUSINESS DIRECTOR, ADDRESSES THE LIMITS TO SIZE OF ULTRA LARGE CONTAINER SHIPS FROM A DESIGN PERSPECTIVE.

# LARGER THAN LIFE



► The maximum size of container ships increased steadily between 1970 and 2000. During this 30-year period, the size of the largest ship on the sea grew by about 1,500 twenty-foot equivalent units (TEU) every 10 years, from 2,000 TEU in 1970 to 6,500 TEU in 2000.

After 2000, the maximum size of container vessels increased even more rapidly. In the 10 years between 2000 and 2010, the maximum size more than doubled from 6,500 TEU to 13,500 TEU, and will reach 19,000 TEU soon.

Currently, the largest container ships, or ultra large container ships (ULCSs), have a length of about 400m and accommodate up to 24 bays and a beam of about 59m, which fits 23 rows of containers abreast.

This development is the result of continued growth in the seaborne trade of developed goods, fuelled by globalisation. A key reason behind the persistent increase in ship size is that larger vessels have better economies of scale or lower transportation costs per TEU, also known as slot costs.

Ships have continued to grow in size as decreases in operating costs per unit have outweighed increases in the capital costs and total operating costs of running them.

Following extensive studies on whether this will apply to even larger vessels in the future, DNV GL found that slot costs will be reduced by about 3 per cent when ship size increases from 18,000 TEU to 21,000 TEU.

When discussing possible options for increasing ship capacity from a ship design perspective, however, there are factors including length, beam and draught that limit how far this can go.

### Length

The smallest practical increment in ship length is the length of one container bay – approximately 14.6m. However, a one-bay cargo hold is inefficient. Extending an existing hold with a third bay is not feasible as such an arrangement on a ULCS would not fulfil the damage stability criteria requirements set out in the Safety of Life at Sea Convention. Consequently, the most relevant increment would be a two-bay hold in the mid-ship area, which would increase ship length by about 29.2m to a new overall length of about 430m.

Ship length has a huge influence on ship strength. A ULCS's design requires high plate scantlings in the upper part of the ship. Presently, 80mm to 100mm scantlings are common, and they keep stress levels in structural elements within acceptable limits. Increasing present scantlings will be difficult as thicker plates cannot be handled

and processed efficiently with presently available technology.

Another option is to use higher strength steel material in critical parts of the structure than what is used today. However, changing the upper part of the hull structure from a material of 400MPa tensile strength to 470MPa (an increase of 17.5 per cent) only reduces the required scantlings by 3mm (or around 4 per cent). This is not an efficient option due to the much higher cost of processing higher strength steel.

If ship length increases beyond 400m, either the beam and depth have to be increased or the width of the double hull and the side tank structure would need to be extended to allow for higher bending moment, while keeping scantlings within the limits discussed earlier.

Port and terminal restrictions that should also be considered when increasing ship length include limits in seaways during voyage, manoeuvrability, and available quay lengths and berthing places.

Despite these foreseeable difficulties, increasing ship length remains a feasible option. Based on DNV GL's estimates, adding a two-bay hold would boost a ULCS's total capacity to about 20,760 TEUs.

### Beam

From a ship strength perspective, increasing the beam should be easier than increasing ship length as the beam mainly influences transverse strength, while loads are increased only linearly.

However, deflection of the transverse bulkhead may become an issue when the beam is increased. Due to increased flexibility of the bulkhead structure, longitudinal deflection may reach a value that could be critical for the container stack in front of the bulkhead.

A wider beam may also lead to high transverse accelerations, and impose limitations on and risks to container stowage and securing. These would need to be adapted to a wider beam to allow efficient utilisation of the increased capacity.



Presently, the most critical limitation on any increase in beam width may be the outreach of gantry cranes in various terminals around the world where the new generation of ULCSs will call. Not all ports on the Asia-Europe trade routes, where ULCSs of over 18,000 TEU will be deployed, are equipped to handle the present generation of ULCSs with 23 rows; only a few ports can handle ships with 24 to 25 rows. Ports and terminals have been known to adapt their equipment to the needs of container lines, however.

ULCSs with 24 or 25 rows could also face other infrastructural limitations. In the Suez Canal, for example, draught limitations and convoy restrictions apply to ships with wider beams.

Increasing beam width would increase ship capacity to 20,750 TEU for an

additional row of containers, and 21,700 TEU for two more rows.

### Draught

Currently, ULCSs are usually built with a design draught of 14.5m and a scantling draught of 16m. Utilisation of draught or deadweight depends mostly on cargo or container profile. The majority of ULCSs seldom utilise their full deadweight capacity; instead, they frequently operate around or even below their design draught.

A number of harbours and seaways on the Asia-Europe trade are exposed to draught restrictions. But maximum deadweight utilisation or draught is normally experienced only during the voyage between the last loading post and the first discharge port.

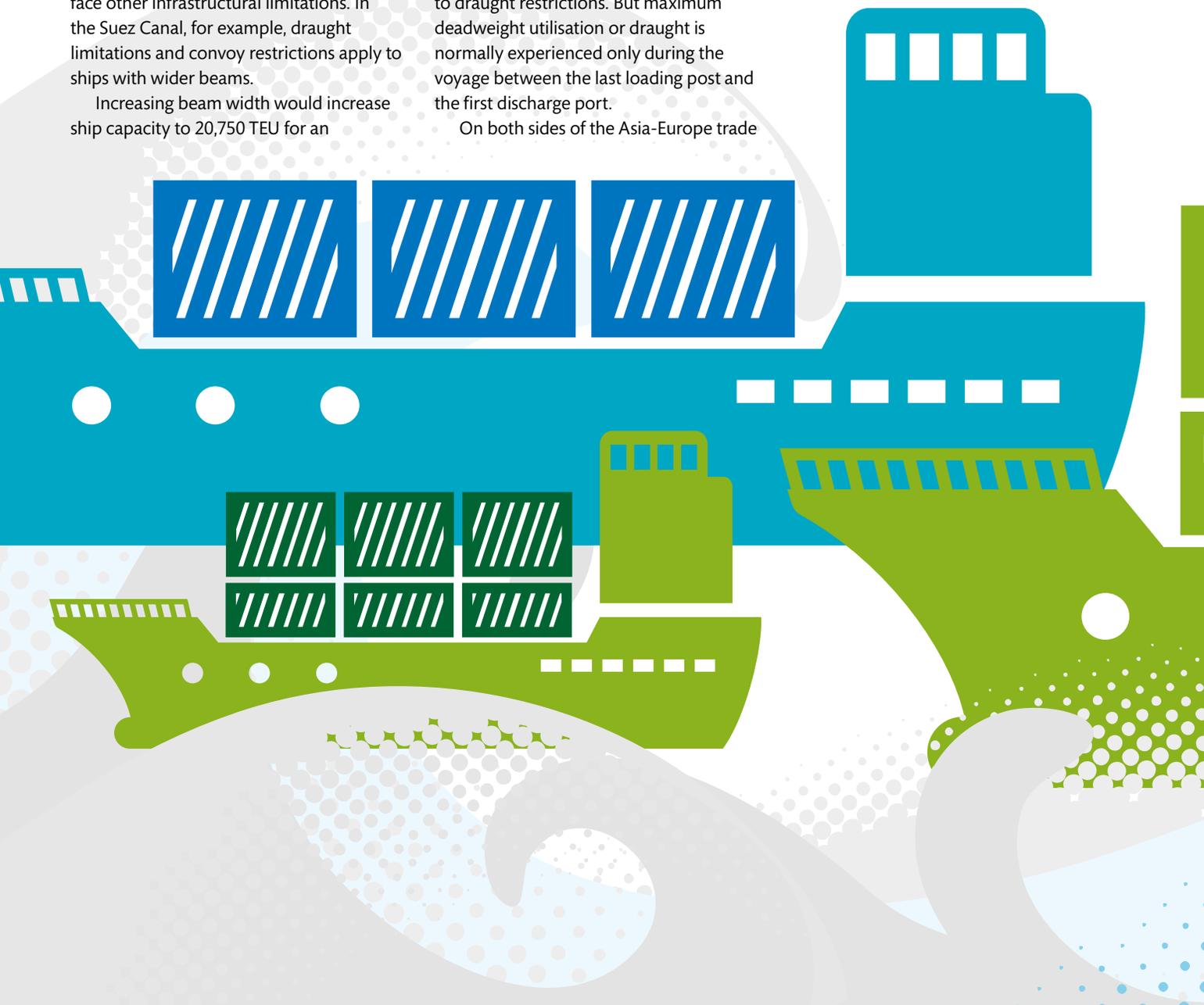
On both sides of the Asia-Europe trade

route, ports and terminals that serve this purpose are available.

For ships with wider beams in particular, the size of the Suez Canal can be a limiting factor for draught as mentioned earlier. Hence, there is not much room for increasing the draught of ULCSs in the near future.

### Air Draught

Limitations on air draught may be an issue on seaways, due to bridges such as the Osaka Bay Bridge and Hamburg's



Kohlbrand Bridge, which have certain restrictions, and also in ports, due to the limited height of container gantry cranes.

A number of terminals along the Asia-Europe route are, at present, not equipped with adequate crane technology to allow efficient handling of ULCSs that are 18,000 TEU or larger. This applies to both the outreach of the cranes, as well as the height of the gantry crane boom. With progressive upgrading of gantry crane technology in the relevant ports, however, these limitations are expected to vanish over time.

### Depth

Current ULCSs have a depth of about 30.4m, which facilitates the carriage of either 10 high cube containers or 11 standard height containers on top of each other in hold.

Stacking more than 11 containers is not possible due to the limited strength of the boxes. Theoretically, one could consider introducing stoppers in the cell guides and isolating layers of containers, but since there is little room for increasing draught, this option is neither efficient nor likely to happen easily.

Other factors such as propulsion design in relation to the maximum power of engines and the maximum load on propellers, as well as the emergence of liquefied natural gas as a fuel option that is efficient and yet environmentally friendly, will also affect future growth in the capacity of container ships.

### Conclusion

A further increase in the maximum size of ULCSs is likely, since limits to the economies of scale from bigger ships have

not been reached – provided that the ships can be sufficiently utilised.

From a ship design perspective, there are certain critical factors that need to be considered in the light of present typical layouts. In principle, though, further increases in size and capacity seem possible. It appears easier to increase the beam rather than ship length, but this will be possible only when terminal infrastructure is developed accordingly.

By increasing ship length by one two-bay cargo hold (26 bays in total) and beam width by two rows (25 rows in total), the ultimate container ship capacity that could be reached is almost 23,000 TEU.



# MASTERING A VOYAGE

► Captain Dominic Tan, 42, a shipmaster with ASEAN Cables (ACPL), oversees a crew of about 50 on board the cables ship *ASEAN Restorer*. ACPL, a joint venture of six ASEAN telecommunications companies, was incorporated in Singapore in 1986 at the initiative of the ASEAN Sub-Committee on Posts and Telecommunications. The company repairs and maintains submarine cables around South-east Asia and the Indian Ocean, and has been one of the leading companies in the submarine telecommunications fibre optic cable industry. Capt Tan shares with *Singapore Nautilus* his experiences of battling rough seas and spending long periods away from his wife and 14-year-old son.

## How did you become a ship captain? What do you love about your job?

I have worked in the shipping industry for 16 years, and have been a ship captain for four years. I started out as a deck cadet on board tankers in 1994 after my national service. Because I come from a poor family, taking up the fully-sponsored Diploma in Nautical Studies would not cause any financial burden to my family. I was determined to break away from my situation, and worked my way through the ranks to get to where I am today.

What I love most is the opportunity to travel. Some of the more exotic places I've travelled to prior to joining ACPL are the Republic of Congo (Africa), Zhanjiang (China) and Incheon (South Korea); my

favourite destination is Hong Kong because of its beautiful coast, and the sight of the city lit up at night. There's also no need to deal with morning traffic, and I still find myself learning many new and different things on the job every day.

## What is your typical routine?

I am typically away at sea for six to seven months a year. Each commission lasts three to four months, followed by paid leave of one and a half to two months. On a typical workday, I make sure that everything is in good order and that the ship is operationally ready. I also check that the ship's statutory certificates are in place and ready before we depart.

During cable repair operations, my primary role is to plan and coordinate the repair work among various departments, such as deck, engine, cable and subsea. I split shifts with my Chief Officer as the repair goes on round the clock. There are several steps in a repair operation, from locating the actual cable fault to retrieving the faulty cable and bringing it on board, and replacing the faulty section with good cable stock before restoring the repaired cable in position on the seabed. All these steps have to be closely monitored and executed with care, to ensure the cable system runs properly after our repair.

I also manage 50 staff from different countries such as India, Indonesia, Myanmar and Malaysia. The different nationalities and cultures can make

communication tough at times, but I encourage them to adapt and get along.

## How do you manage difficult situations at sea?

To guard against piracy, we conduct nightly patrols on board, and this includes always putting out our water hoses as a precaution. So far, there have been no piracy attempts on our vessel. We've also sailed to Hong Kong during its monsoon season, with swells reaching up to 4m high. Even the most veteran seafarer became seasick, but with the right motivation, we've always managed to overcome rough waters and tough situations.

## Can you highlight a memorable experience as a ship captain?

I remember being tasked, along with my crew, to repair a cable south-east of Pedra Branca and east of Bintan Island in 2012. We were puzzled, as the 7km long cable was missing and couldn't be located even after two days of intensive searching. It turned out that the cable had been stolen. The fishermen who stole the cable were caught, but because the original cable had been cut into pieces and resold, we re-cabled using spare cables on board our ship. The entire project took about a month to complete!

## What qualities do you feel are crucial for ship captains to have?

A ship captain must have leadership



CAPTAIN DOMINIC TAN SHARES WHAT IT'S LIKE BEING THE MASTER OF A VESSEL, MANAGING A DIVERSE CREW, OVERCOMING CHALLENGES AT SEA, AND EVEN HELPING THE AUTHORITIES SOLVE A MYSTERY OF MISSING CABLES. BY **DESMOND NG**

qualities, patience, and a good sense of humour. He or she must also be able to understand and manage people. In terms of technical knowledge, a ship captain must be well versed with shipping fundamentals. You can't just depend on technology, which is now so advanced that ships can be run with a lean crew of 16 to 20. There is always a chance of technology failing, or being affected by unforeseen events such as abnormal solar activity, which affects the accuracy of the ship's positioning via GPS. A good ship captain has to know both the capabilities and the limitations of the ship, so as to keep things in order.

As most unfortunate events are caused by human error and poor decisions, a good ship captain has to anticipate and know how to handle any situation at sea effectively, or results could end up being disastrous. There's also the importance of keeping calm and treading carefully in any decision-making process - I always remind my officers to check, double check, and check a third time before taking any action.

**How do you pass the time on the ship, and how do you cope with being away for long periods of time?**

I keep myself entertained on board by watching movies, and having occasional karaoke sessions. I'm getting used to being away from home for long periods at a time, and the Internet connection on board the ship makes things easier - I can keep in touch with my family that way.

As development of the new Tuas Terminal gets underway, a group of marine experts and volunteers are working to relocate local coral colonies around the Sultan Shoal Lighthouse to their new homes.

Of the estimated 2,800 colonies near Sultan Shoal, about 1,600 colonies will be transplanted to three sites at St John's Island and the Sisters' Islands. The move includes all types of hard corals – a key

component of coral reefs – found near the shoal.

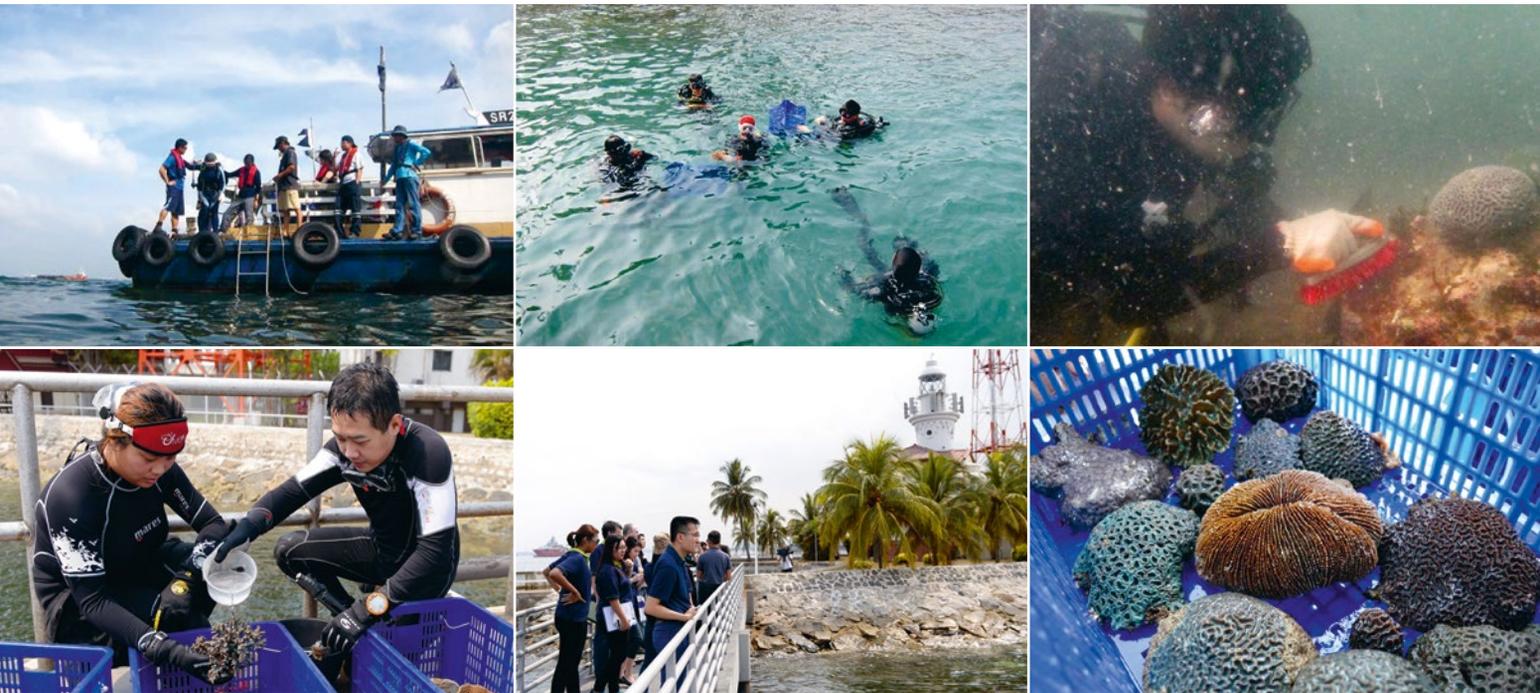
The relocation project is being carried out by research and consulting group DHI Water & Environment, with help from volunteers who assist with the harvesting, transportation, distribution and reattachment of the corals.

Between last September and March this year, they transplanted close to 1,400 coral colonies.

The Maritime and Port Authority of Singapore conducted a trip for the local media to Sultan Shoal Lighthouse on April 26 to help them better understand the relocation process.

After the move is completed in August this year, surveys will be carried out at regular intervals over the next five years to monitor the health of the corals in their new environments.

BELOW: Marine experts and volunteers have been working tirelessly to relocate coral colonies around Sultan Shoal to their new homes near the Southern Islands since September 2013.



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