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▶ greener energy for shipping ▶ homage to Fort Canning Lighthouse

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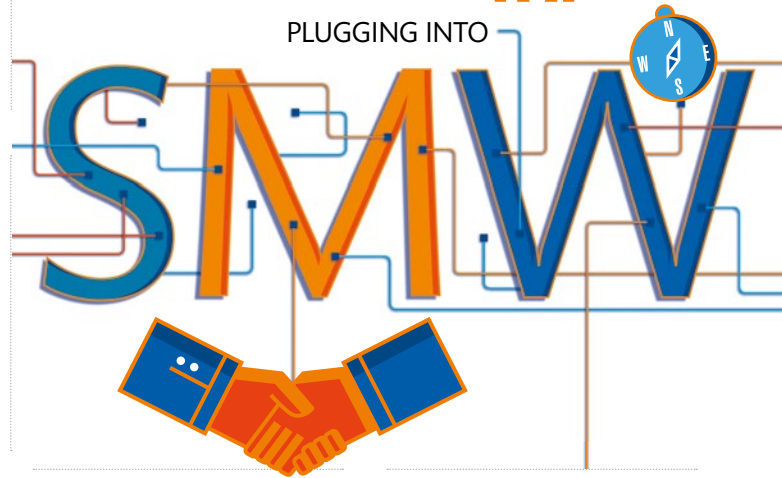
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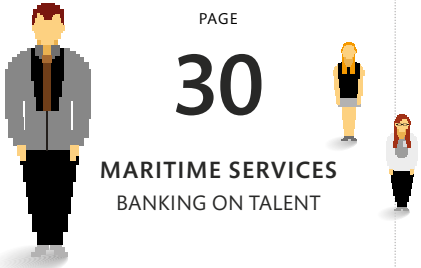
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Reaching people,
growing ideas,
creating opportunities



As the ninth instalment of Singapore Maritime Week (SMW) rolls around, MPA continues to stay true to its mantra of reaching out to people, inspiring the spread of ideas, and harnessing maritime opportunities for its participants. SMW maintains strong growth in 2014, attracting a wide range of maritime conferences, dialogues, and networking sessions, which

are aimed at both the maritime community and members of the general public.

This year, we are honoured to have Mr Jacques de Chateauvieux, Chairman of BOURBON, and Chairman and CEO of JACCAR Holdings, to deliver the Singapore Maritime Lecture, a highlight of SMW. Participants can also look forward to events such as the SMI Seminar: Automation and Autonomy, the Singapore Bunkering Symposium, as well as the Seatrade Asia Awards 2014. Outreach events have also been amped up this year, with a total of three SMW exhibitions, the Amazing Maritime Hunt, and the conclusion of the SMW 2014 "Maritime Singapore Through Your Lens" photography competition. A photography feature on the winners of the competition can be found following the Feature article this issue.

Those interested in Singapore's successful bunkering sector might also want to tune in to our Technology section, where we reveal the workings behind the

mass flow meter system, aimed at developing the efficiency and integrity of the bunkering industry.

We also interview Ms Celeste Yeong from Sinanju Tankers, one of the leads in her organisation's mass flow meter project. A project and development manager, she also sources for and purchases marine parts for Sinanju's fleet. Turn the page to Maritime Careers to find out more about a day in her life.

Finally, readers can also find out what Mr Henning Mohn, Head of Section, Shipping Advisory, DNV GL Singapore, had to say at MPA's SRS forum last December about clean fuels. His speech, entitled "Clean Fuels For The Future", explored alternative fuels such as LNG, and has been reproduced in our Commentary section.

A stylized, handwritten signature in black ink, appearing to read 'Shirley Tan'.

Shirley Tan
Executive Editor

Inaugural Lecture on Global Trends in Shipping and Impact on Port Cities

► To ensure that Maritime Singapore remains ready to tackle any future challenges, MPA Academy – the training arm of the Maritime and Port Authority of Singapore (MPA) – and the Centre for Liveable Cities (CLC), jointly organised their first lecture on Feb 19 that discussed global trends and how the shipping industry could be affected.

Titled “Global Trends in Shipping and Impact on Port Cities”, the lecture saw a large turnout of over 270 people, including shipping professionals as well as students and executives from the private and public sectors. Dr Martin Stopford, President of Clarkson Research Services Limited, gave the lecture.

Dr Stopford, who is also a well-known economist in the maritime industry, spoke about the implications of developing mega-trends in port cities such as Singapore. These trends include globalisation, the changing geopolitical scene, and mechanisation – a big driver of the last 50 years that is now facing diminishing returns as fossil fuel prices and environmental costs rise.

Mr Andrew Tan, Chief Executive of MPA, who was the moderator for the session said: “Given the future challenges facing the maritime industry, we are pleased to partner with CLC to invite experts like Dr Martin Stopford to provide insights into how port cities like Singapore can face up to

the competition.

“We need to keep ourselves abreast of changes if we want to be a premier global port and international maritime centre providing good jobs and opportunities for all in Singapore.”

The Executive Director of CLC, Mr Khoo Teng Chye, added: “CLC is glad to gather urban and maritime practitioners today as part of CLC’s mission to share knowledge on liveable and sustainable cities. Many cities originate and continue to be important port cities, and some have developed a strong marine industry. Singapore is one of them.”

BOTTOM LEFT: Dr Martin Stopford giving his lecture on global shipping trends and their impact on port cities.
BOTTOM RIGHT: Over 270 people attended the session, which was moderated by Mr Andrew Tan, MPA’s Chief Executive.



Promoting innovation in Maritime Singapore

► The research and development (R&D) scene in Maritime Singapore received a boost in February when the Maritime and Port Authority of Singapore (MPA) and DNV GL – the world’s largest ship and offshore classification society – signed a Memorandum of Understanding (MOU) during the latter’s 150th anniversary celebrations.

MPA’s Chief Executive, Mr Andrew Tan, signed the MOU alongside Dr Henrik Madsen, DNV GL’s Group President and Chief Executive Officer.

The MOU will promote maritime R&D in several areas, including liquefied natural gas (LNG) research and technology, the use of energy-saving and emissions reduction technology in ports, as well as projects designed to cut emissions and boost fuel efficiency.

Mr Tan said: “The signing of this MOU signifies a shared vision to drive our maritime industry research efforts. It will

also help position Singapore as a centre of excellence for maritime research. I’m confident that this partnership will grow stronger and contribute to the overall growth of the maritime sector.”

Noting that both parties have built a relationship over the past few years by jointly and separately championing projects that sought to reduce emissions and improve fuel efficiency in shipping, Dr Madsen said that the MOU will help to further this relationship.

He added: “The MOU is a reflection of the emphasis we place on innovation and R&D at DNV GL. We are making a significant and sustained group-wide commitment by investing in the future of our industry... This is at the heart of our goal of making the industry safer, smarter and greener.”

He also said that DNV GL will continue investing around 5 per cent of its annual revenue to R&D, and will have hubs of innovation around the world.



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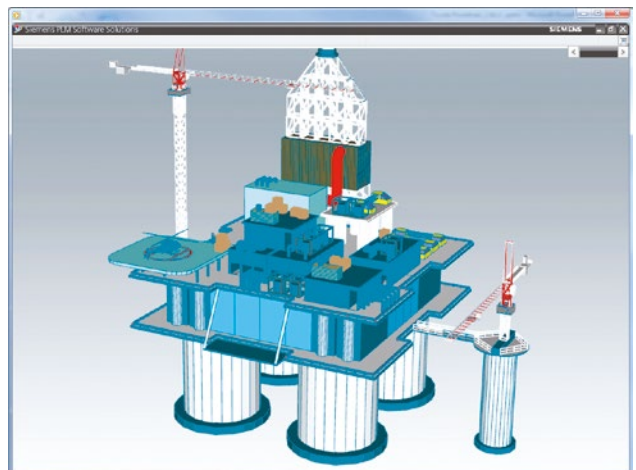
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ReCAAP ISC commended



► ReCAAP (The Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia) ISC (Information Sharing Centre) received praise during the 8th Annual Meeting of its Governing Council from March 4 to 6 for development in areas such as research and analysis, as well as engagement with other organisations on combating piracy and armed robbery against ships.

Australia officially joined the ReCAAP community on

Aug 3 last year. This latest addition demonstrates the initiative's credibility and growing relevance in the international maritime community. It also further underscores the importance of international cooperation in combating piracy and armed robbery effectively.

In another testament to its credibility, ReCAAP ISC's reports are also frequently cited in media and industry publications. The International Maritime

Organization (IMO) has held up the ReCAAP initiative as a model of intergovernmental cooperation against piracy that other regions can emulate. The ReCAAP ISC has also participated in several international conferences and forums on piracy matters.

The Council also commended the ReCAAP ISC on the release of its 2013 annual report, which revealed that even though the total number of maritime incidents in Asia has increased slightly,

the number of severe incidents has been decreasing each year. The overall improvement of the piracy and armed robbery situation in 2013 has demonstrated the effectiveness of the ReCAAP information-sharing network, as well as the operational-level cooperation and collaboration among the stakeholders.

The meeting also took time to acknowledge the success of various ReCAAP ISC capacity building activities, including the ReCAAP ISC Capacity Building Workshop in Singapore (August 2013), and the ReCAAP Focal Point Senior Officers' Meeting in Guilin, China (November 2013), which was co-organised with the China Maritime Search and Rescue Centre of the People's Republic of China.

In addition, the Council was pleased with the successful conduct of the cluster meeting in Manila, the Philippines (September 2013). The meeting, which was co-organised with the Philippine Coast Guard, helped to enhance inter-ministry coordination and facilitated an exchange of views with the Philippines' maritime industry representatives.

ABOVE: Participants at the 8th Annual Meeting of the ReCAAP ISC's Governing Council.

Enhancements to Marinet from April 1

► Marinet, an Internet-based e-commerce system that provides a wide range of e-services for Singapore's maritime community, will see various enhancements from April 1.

These enhancements were made following customers' feedback. They reflect the Maritime and Port Authority of Singapore's (MPA) commitment to continue gathering customers' feedback at its regular financial feedback sessions.

The new updates will make it more convenient for users to retrieve financial documents and pay for services using alternative modes of payment.

In addition, there will no longer be a charge for using Marinet from April 1. Customers with existing Marinet accounts will enjoy cost savings ranging from S\$128 to S\$556 a year.

The new e-Finance services will comprise the following:

- e-Bills Bills of up to a year can be viewed, downloaded or printed online
- e-Statement Statements of accounts of up to a year can be retrieved online
- e-Payment Payments for bills and fines can be made using e-Nets
- e-Wallet Payments for value-added services can be made using e-Wallet's stored value system. Customers on Giro can choose to top up the e-Wallet using Giro.

More efforts to promote Maritime awareness and youth outreach

► The Maritime and Port Authority of Singapore (MPA) reached another milestone on Jan 7 when it inked a Memorandum of Understanding (MOU) with two other organisations – the Singapore Maritime Foundation (SMF) and the Singapore Scout Association (SSA) – with regard to the establishment of a Youth Maritime Advisory Board.

This advisory board will promote awareness of the maritime industry to the public, as well as inform youths and scouts of career opportunities. Comprising industry representatives, the board will seek to achieve these outreach objectives by organising maritime-related activities and discussions for youths and scouts. This initiative also highlights MPA's commitment to provide the best youth development programme in Singapore.

Mr Andrew Tan, Chief Executive of MPA, signed the MOU alongside SMF Executive Director, Mr David Chin, and SSA Chief Commissioner, Mr Tan Cheng Kiong. MPA's Mr Tan said: "The maritime industry plays a very important part in Singapore's economy. Today, we are delighted to partner SMF and the SSA in reaching out to the youth, to raise awareness of the maritime industry and its exciting career opportunities through greater education and outreach. We will be stepping up our efforts

in the coming months."

Efforts to promote interest in the maritime industry among youths have already taken shape in the form of the Young Mariner's Badge Programme, which kicked off in October 2013. Eight primary and secondary schools took part in the pilot programme. Representatives from the various institutions received their badges from Mr Lui Tuck Yew, Minister for Transport, on Jan 7.

The programme has now

been rolled out to other schools. Of the newly inked partnership, Mr Chin said: "The Singapore Maritime Foundation is constantly on the lookout for new partners and new initiatives to raise the profile of the Singapore maritime industry.

"We are happy to have like-minded partners like MPA and SSA, and we hope that the students will enjoy learning more about the maritime industry through the Young Mariner's Badge Programme."

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Navigational safety dialogue sessions by MPA and SSA

► Over 100 representatives from the maritime community attended a dialogue session on Feb 13 that aimed to reinforce the importance of navigational safety. The session was organised by the Maritime and Port Authority of Singapore (MPA) and the Singapore Shipping Association, and there are plans to carry out more such dialogues over the coming months.

These sessions will also serve as reminders to crew members about their individual responsibilities in ensuring navigational safety. The attendees welcomed the initiative, with many taking the opportunity to voice suggestions which would be considered through further dialogues between MPA and the maritime community.

MPA is currently in the final stages of developing a safe passage guide for those travelling in the Straits of Malacca and Singapore, in cooperation with the littoral states of Malaysia and Indonesia and the Baltic and International Maritime Council (BIMCO). It will be made available as soon as it is ready.

MPA facilitates learning journey for international maritime officials



► A group of over 20 international maritime officials from 14 countries were in Singapore from March 3 to 7, as part of their learning journey toward attaining the Masters Programme in Shipping and Port Management at the World Maritime University (WMU) in Malmo, Sweden.

The Maritime and Port Authority of Singapore (MPA) hosted these officials, helping them learn first-hand about Singapore's port operations and management, as well as facilitating an exchange of insights on the development of the shipping industry. The five-day programme included visits to PSA's Container Terminals, MPA's Port Operations Control

Centre at PSA Vista (POCC-Vista), and MPA's Integrated Simulation Centre. Through the various site visits, the officials, led by Professor Patrick Donner, Associate Academic Dean of WMU, gained a better understanding of Singapore's container terminal operations and the application of technology to enhance navigation safety and productivity in the maritime sector.

Captain M Segar, Assistant Chief Executive (Operations) of MPA and WMU alumnus, said: "MPA remains committed to raising global shipping standards. Having benefited from well-delivered technical assistance in our formative

years, we make it a point to contribute back to the international maritime community through the sharing of maritime expertise and capacity building."

Professor Donner added: "Since 2004, MPA has been graciously hosting this eye-opening Field Study Visit, which has given our students unparalleled insights into the various facets of shipping and port management. WMU students appreciate the opportunity to learn first-hand from one of the world's leading maritime centres."

ABOVE: Captain M Segar with international maritime officials during their visit to Singapore.

Visit by UK Minister



Mr Stephen Hammond, UK Parliamentary Under Secretary of State for Transport, paid a visit to MPA in February 2014.

Ship-to-Ship Transfer



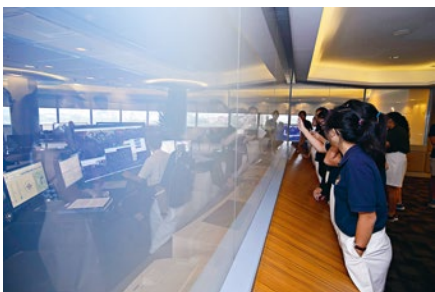
A ship-to-ship transfer involving LNG cargo was carried out in Singapore's waters for the first time in January 2014. The successful operation involved two ships, *Al Gharrafa* and *Al Ghashamiya*.

Chinese New Year Media Lunch



In February 2014, MPA hosted its annual Chinese New Year media appreciation lunch at The Glass House at Fort Canning, with Mr. Lucien Wong (4th from right), Chairman, MPA, as the Guest of Honour.

Visit by Serangoon Junior College

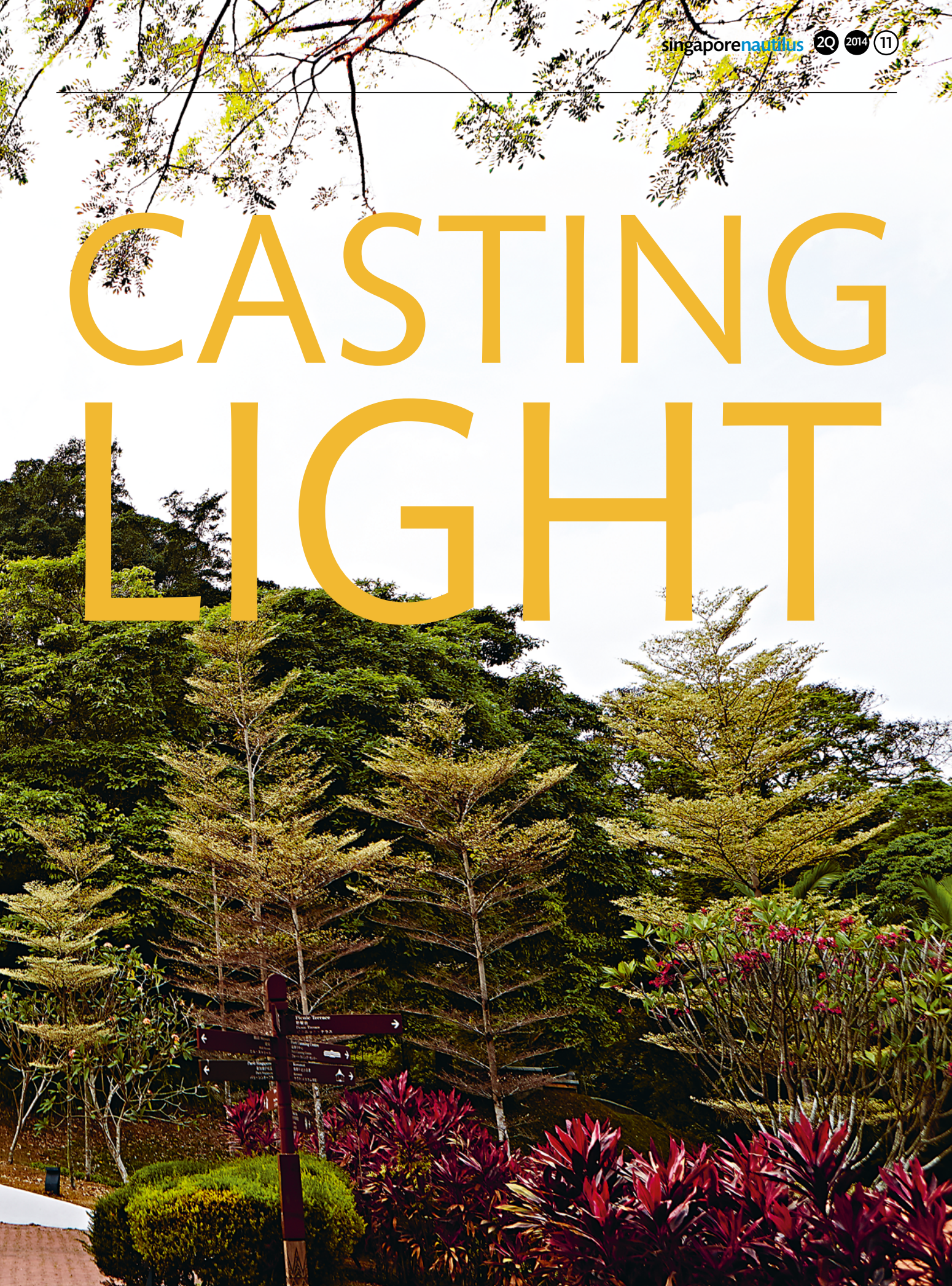


Students from Serangoon Junior College paid a visit to MPA's Port Operations Control Centre at PSA Vista.

ELOISE LEE RETRACES THE ROOTS OF THE LITTLE-KNOWN FORT CANNING LIGHTHOUSE, AND FINDS OUT HOW IT PLAYED A PIVOTAL ROLE IN GUIDING SINGAPORE TOWARDS MODERNITY.



CASTING LIGHT



► The Fort Canning Lighthouse, one of Singapore's first lighthouses, played a pivotal role in our nation's maritime history. However, little has been said about this unsung structure except for the fact that there is a replica of it at Fort Canning today.

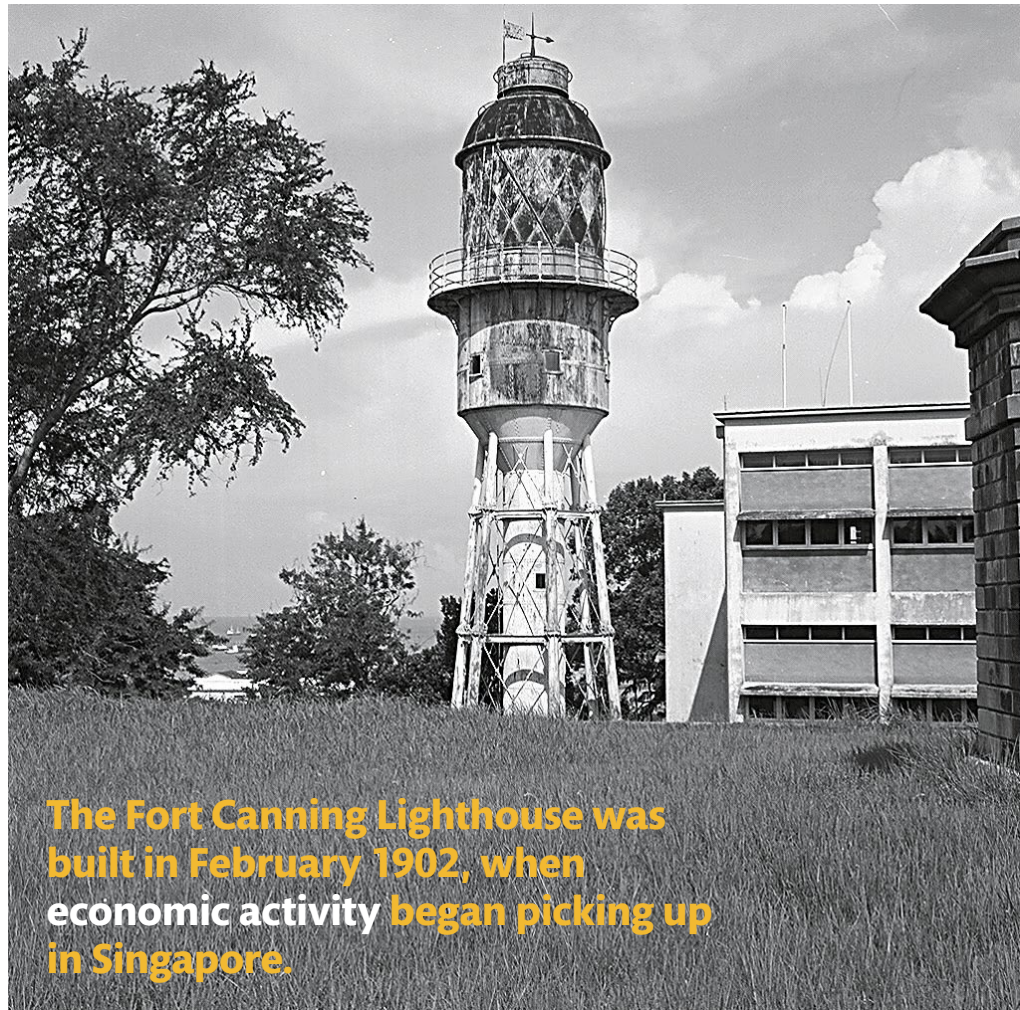
Back in the early 1900s when there were no office buildings and skyscrapers in the area, Fort Canning Hill served as an excellent vantage point from which to monitor activities in the town area and along the Singapore River.

In 1984, archaeologists unearthed artefacts that provided a glimpse into the strategic importance of Fort Canning Hill. They showed that traders across South-east Asia had been using the vicinity of the hill as a gathering point long before Sir Stamford Raffles established Singapore as a free trade port in 1819.

Before the lighthouse

Prior to the construction of the lighthouse, a flagstaff was used to communicate information to ships. It became an improvised lighthouse when a lantern was affixed to it in 1855. Ships used this light for guidance when navigating into the Singapore River. Because it was constantly exposed to the elements, the wooden flagstaff was often in a dismal condition. In 1869, the editor of a local newspaper received a letter notifying him of the condition of the flagstaff, which was manned by convicts. The flagstaff was reportedly in such a bad state that the convicts had refused to ascend it to handle the signal flags.

As economic activity began



The Fort Canning Lighthouse was built in February 1902, when economic activity began picking up in Singapore.

PHOTO SPH - THE STRAITS TIMES

picking up in the late 1900s, it became clear that the presence of a proper lighthouse was necessary. So in February 1902, the Fort Canning Lighthouse was built on the southern side of Fort Canning Hill to replace the flagstaff. Constructed by Riley, Hargreaves & Co, the light at the top of the structure sat at a height of 60.6m, enabling it to be seen by ships up to 30km away.

During the Japanese occupation between 1942 and 1945, the new occupiers of the island took down the flagstaff. The Japanese also did not

care much for the lighthouse and it was left to its dedicated keepers to maintain the structure and its equipment.

The British were quick to revitalise the lighthouse when they retook the island in 1945. In 1948, they also replaced the flagstaff with a mast made of lattice steel.

Lighting it up

In 1946, 54-year-old Stephen Rangel, who had spent his entire career working in lighthouses, earned the honour of looking after Fort Canning's light - the only lighthouse on

ABOVE: The lighthouse, situated on Fort Canning.

the main island of Singapore then. With the job, he also earned a home ashore.

The lighthouse, fitted with what was then the latest model of kerosene-fuelled burner, utilised a dioptric occulting system, aided by dioptric lenses and mirrors that refracted and focused its light to further improve visibility.

The system produced a strong light of 20,000 candlepower that flashed in 20-second intervals – a metal cylinder was lowered around the burner every 17 seconds, eclipsing it for three seconds. It was reported to have been extremely reliable, with an equally economical

consumption of fuel (estimated at around 320 litres a month).

To ensure that the flame was kept burning, the lighthouse keeper had to monitor it from a room below. In order to reach the watch room, he had to climb a ladder inside a metal cylinder that measured 2m in diameter.

It has not always been smooth sailing for the lighthouse. In August 1933, a French skipper reported that it was giving off two or three irregular flashes, instead of the formerly regular light-and-dark intervals. Investigations by the Marine Department revealed that the problem was due to a simple technical defect.

The solution was rudimentary – a mere addition of about 15cm of brass plate to the shutter was all that was needed to get the cylinder to close properly over the light.

Overshadowed by time

With the onset of industrialisation in the 1950s, the lighthouse was obscured from sight by taller buildings in the vicinity.

A new electrical signal light was installed on top of the Fullerton Building (now the Fullerton Hotel) as the lighthouse's replacement. The Fullerton Light could be seen by ships up to 44.4km away and was manned by four staff.

Today, the Maritime and Port Authority of Singapore (MPA) manages the Horsburgh, Raffles, Pulau Pisang, Sultan Shoal, and Bedok lighthouses.

A replica of the lighthouse now stands at Fort Canning Park, regularly viewed by curious visitors on the Heritage On The Hill guided tour.

The replica has been adopted by MPA from the National Parks Board. In conjunction with this adoption, the lighthouse will be accompanied by a Maritime Corner, which celebrates the lighthouse and all its services to Singapore's rich maritime heritage. It is set to be unveiled in April 2014.



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PLUGGIN



DENYSE YEO CHECKS OUT THE BROAD LINE-UP OF DIVERSE ACTIVITIES FOR THOSE IN THE MARITIME COMMUNITY AND BEYOND FOR THE 9TH SINGAPORE MARITIME WEEK FROM APRIL 6 TO 11 THIS YEAR.

► Singapore Maritime Week (SMW) is back for its ninth run in 2014, and is set to be another great success. Organised by the Maritime and Port Authority of Singapore (MPA), SMW remains a highlight on the local and international maritime calendar, gathering participants from the maritime community and beyond for a

week of conferences, dialogues, exhibitions and social events. These events further enhance Singapore's status as a thought leader for important maritime issues, and a venue of choice for major maritime events.

SMW also comprises a growing slew of outreach events and efforts, aimed at boosting better awareness

NG INTO



of the maritime sector's dynamism and vibrancy among members of the general public.

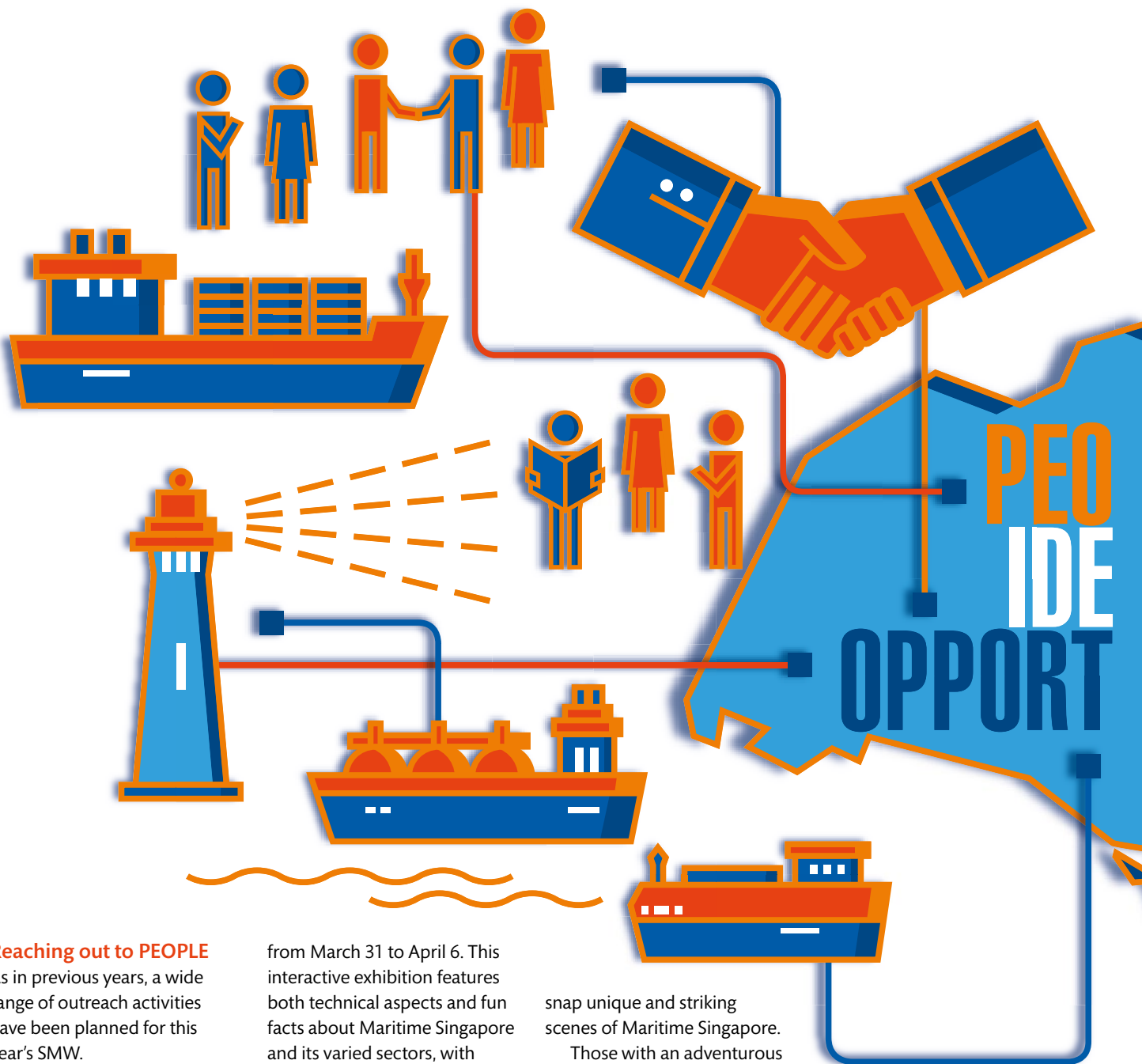
Since its first run in 2006, SMW has grown in size and importance, attracting more participants and event organisers from around the world. New activities aimed at expanding the reach and scope of SMW are added each year,

while participants continue to gain insights into pertinent issues and developments from leading professionals within the industry. In this vein, SMW continues to hold on to its mantra of "People, Ideas and Opportunities" for the maritime community. Andrew Tan, Chief Executive, MPA, says: "SMW 2014 will once again receive

strong support from both the local and international maritime community. Apart from engaging industry partners, SMW is also an important week for MPA to reach out to Singaporeans and to showcase our vibrant maritime industry."

As a sector that contributes about seven per cent of

Singapore's GDP and hires more than 170,000 people, Maritime Singapore also plays an important role in ensuring the timely shipment of daily necessities. Tan says: "We hope Singaporeans can learn more about Maritime Singapore and its career opportunities through the various SMW public outreach platforms."



Reaching out to PEOPLE

As in previous years, a wide range of outreach activities have been planned for this year's SMW.

These outreach efforts aim to boost knowledge of Maritime Singapore among students, youths, and the general public in a fun and accessible way.

Another aim of these outreach events is to acquaint people with the diverse range of career opportunities offered by Maritime Singapore.

First up for 2014 is the SMW exhibition, held at VivoCity

from March 31 to April 6. This interactive exhibition features 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.

Shortlisted entries from SMW's "Maritime Singapore Through Your Lens" photography competition will also be displayed at the SMW exhibition. The photography competition was held from Dec 27, 2013, to Feb 28, 2014, encouraging budding and professional shutterbugs to

snap unique and striking scenes of Maritime Singapore.

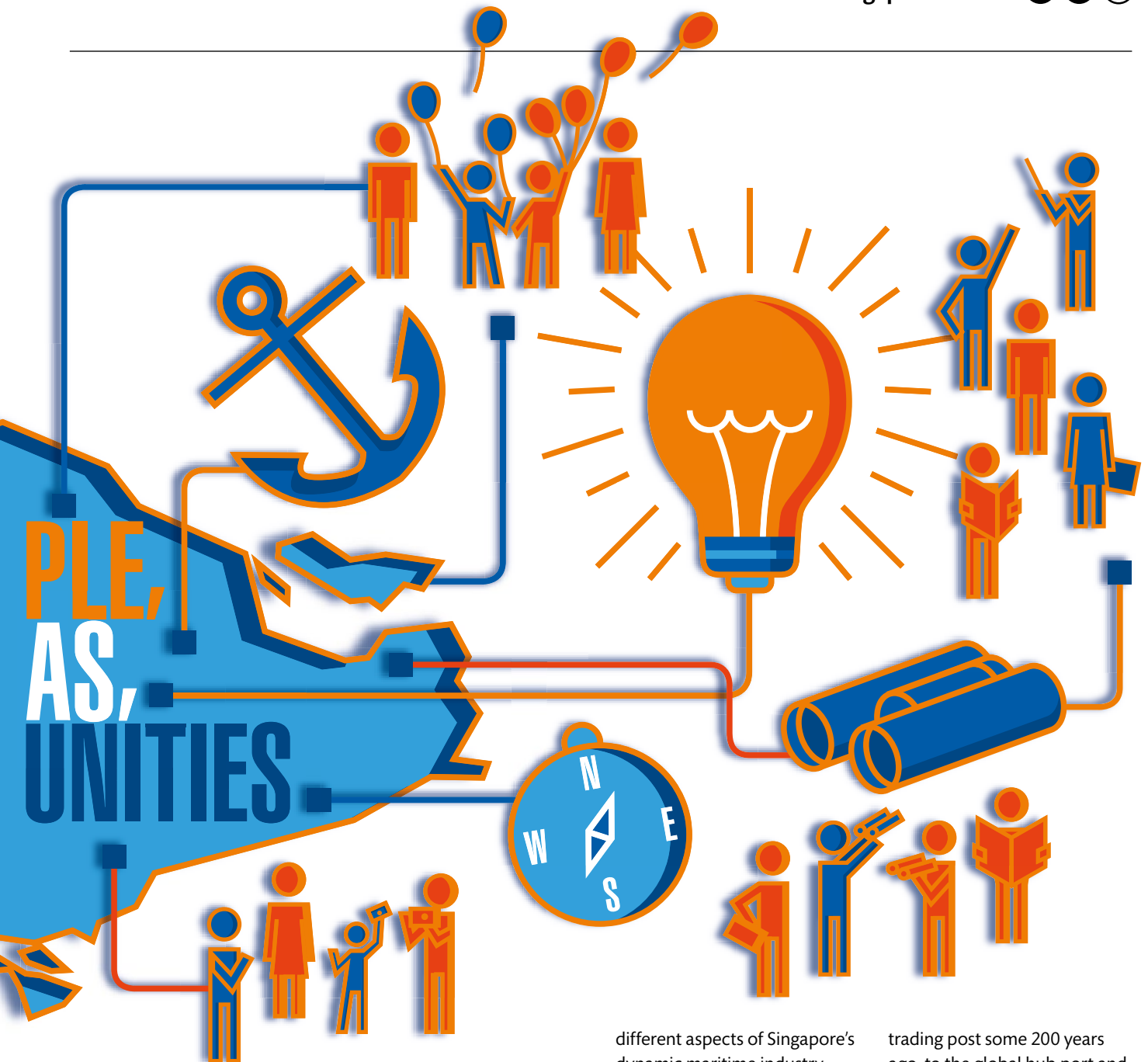
Those with an adventurous streak will enjoy the Amazing Maritime Hunt, where participants are required to compete in maritime-themed games and challenges.

Competing on highest number of points gathered and fastest timing, teams of four will have to strategise their travelling routes and gameplay in order to beat the other teams.

The half-day event on

April 6 is jointly organised by the MaritimeONE initiative, which was jointly formed by MPA, the Singapore Maritime Foundation (SMF), the Singapore Shipping Association (SSA), and the Association of Singapore Marine Industries (ASMI).

Says David Chin, Executive Director, SMF: "Through the Amazing Maritime Hunt, which



is expected to attract about 1,000 participants in 2014, MaritimeONE is able to raise awareness of the dynamic Singapore maritime industry among its participants.

"We hope to continue coming up with similarly exciting outreach events in the future, to raise the profile of Maritime Singapore among the general public."

April 6 also marks the official start of SMW 2014, when the guest of honour,

Minister for Transport Lui Tuck Yew, officially launches the week at VivoCity. The launch will also see various live performances, as well as prize presentations for SMW's Photo Competition and the Amazing Maritime Hunt.

Additionally, during the week of SMW (April 7 to 11), more than 400 people – students, educators, members of the maritime community, and members of the general public – will get to explore the

different aspects of Singapore's dynamic maritime industry. Activities include a trip out to sea, a rare visit to Raffles Lighthouse, as well as a tour of the port terminals.

The Maritime Corner at Fort Canning will also be launched on April 11, when MPA will convert the area around the Fort Canning Lighthouse and Flagstaff into the first of a series of maritime-related locations in and around Singapore, to make up a Maritime Trail.

The completed Maritime Trail will show how Singapore has evolved from an entrepot

trading post some 200 years ago, to the global hub port and international maritime centre it is today.

Last but not least, the International Sportsweek for Seafarers, which promotes healthy living and fosters team spirit amongst seafarers, will continue its annual run from April 9 to 12.

This event will see both local and foreign seafarers taking part in a week's worth of games, including telematches, basketball and football, to celebrate the seafaring profession.

Inspiring IDEAS

To facilitate a keen exchange of ideas and insights within the maritime industry, SMW 2014 also features a wide range of conferences, forums and seminars. Members of the maritime community use this opportunity to come together from all over the globe and share their opinions on pertinent maritime issues.

One such meaningful exchange of ideas is the well-received Singapore Maritime Lecture. Organised by MPA, this lecture is SMW's anchor event every year, providing a platform for prominent maritime personalities to share their insights on current maritime topics.

Held for the eighth time in 2014, the lecture is a high-level forum, attended by senior industry players and decision-makers. Past speakers include former Singapore prime minister Lee Kuan Yew, James Hughes-Hallett, Chairman of John Swire & Sons, and Koji Sekimizu, Secretary-General of the International Maritime Organization. Delivering this year's lecture is Jacques de Chateauvieux, Chairman of BOURBON, as well as Chairman and CEO of JACCAR Holdings.

The Singapore Maritime Institute (SMI) and Nanyang Polytechnic will also participate in SMW 2014 through the SMI Seminar: Automation And Autonomy. Some objectives of the seminar include the sharing of relevant industry challenges and opportunities among its participants, exchanging ideas for research and development capabilities and technology development, as well as

promoting R&D collaboration between relevant stakeholders in the industry, academia, and the research community.

Says Heng Chiang Gnee, Executive Director, SMI: "Automation and autonomy' is one of the key focus areas on the SMI R&D Roadmap. The biggest motivations for the industry behind automation and autonomy are labour productivity, the elimination of human errors, and the pursuit of new frontiers."

Also on this year's SMW calendar is the Singapore Bunkering Symposium. To be held on April 8, the annual forum allows MPA to engage and update the bunkering community on key industry issues. This event is targeted at bunker suppliers, bunker craft operators, bunker testing laboratories, bunker surveyors, and selected shipping companies.

Says Dr Parry Oei, Director, Port Services, MPA: "The support we've received so far for the previous bunkering forums reflects the ever-growing importance of the bunkering industry to Singapore. As this is the top bunkering port in the world, MPA can use this networking opportunity to learn from and exchange valuable insights with the industry, in order to bring Singapore's bunkering service standards to the next level."

Other events held in conjunction with SMW 2014 include the annual ReCAAP Information Sharing Centre's Piracy and Sea Robbery Conference, which allows the industry to share information on

piracy and robbery at sea. This year's event, the sixth in the series, is themed "Piracy and Sea Robbery: Emerging Challenges", and is expected to attract 150 participants on April 8.

Another SMW 2014 event is the Asia Pacific Superyacht & Boating Conference, held from April 8 to 9 at ONE°15 Marina Club at Sentosa Cove, which aims to provide insights into the Asian boating market. Following this is the prestigious annual Singapore Yacht Show, from April 10 to 13 at the same location. This fourth and largest edition expects to draw 15,000 participants.

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

Harnessing Maritime OPPORTUNITIES

There are also many social and networking opportunities present within SMW's line-up of conferences and forums that allow industry players and participants the chance to exchange ideas and strengthen partnerships and collaborations.

One example of this is the 6th Annual Offshore Drilling Conference from April 6 to 9. The only event dedicated to offshore drilling rig investment, design, build and operations will examine the different opportunities, investments and developments in Asia's offshore drilling market.

The Seatrade Asia Awards 2014 will also be rolled out on April 7 at the InterContinental Singapore hotel, honouring the best of Asia's maritime industry. Categories for 2014 include the Environment Protection Of The Year Award, the Ship Owner/Operator Award, and the Seatrade Personality of the Year Award.

Says Vanessa Stephens, Global Events Director, Seatrade: "The Seatrade Asia Awards 2014 will be a night to remember, with top shipping executives coming together to celebrate the finest in Asia's maritime community. This is the perfect opportunity for companies to extend corporate hospitality to clients and business partners joining the hundreds of top shipping executives who will be gathered to reward outstanding performances at the region's finest shipping event."

Participants with an eye on rising fuel costs can also look forward to the inaugural



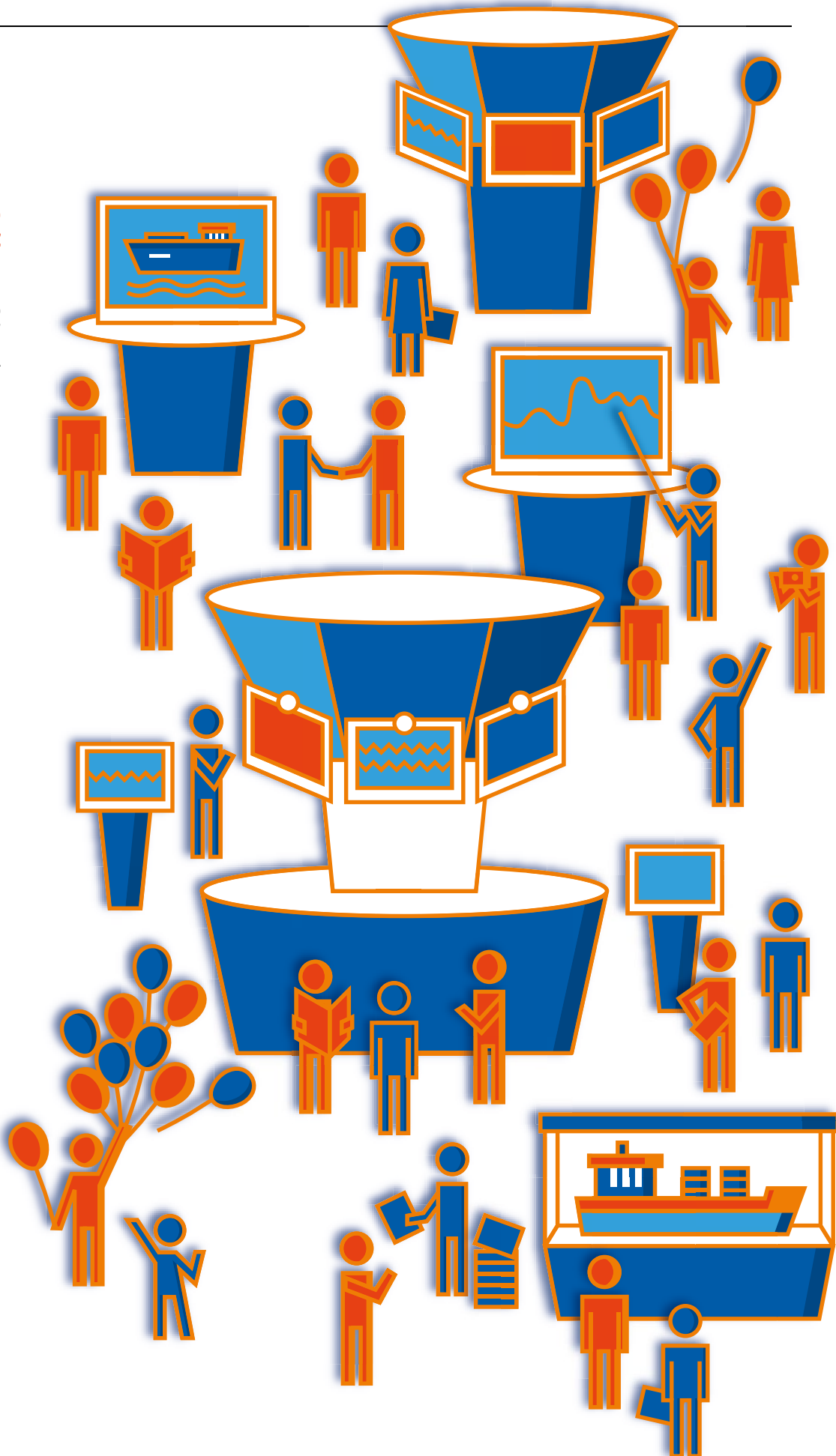
“SMW 2014 will once again receive strong support from both the local and international maritime community.”

Andrew Tan, Chief Executive, MPA

half-day forum, LNG As A Marine Fuel. With Singapore investing in future liquefied natural gas (LNG) bunkering, this very relevant forum will examine the viability of LNG as an alternative fuel for the world’s merchant fleet. Some 70 participants are expected to attend this event at the Fullerton Hotel on April 7.

Another part of SMW 2014 is the Oxford Bunker Course (Advanced), a three-day intensive, advanced version of the one-week Oxford Bunker Course. Held twice a year in Oxford in the UK, the original course has been hailed as the “best bunker course in the world”. The Singapore edition of the Oxford Bunker Course (Advanced) is organised by Petrosport, and is designed for those with at least two years of bunkering experience.

Additionally, the 6th Annual Offshore Support Vessels Conference is the answer to the burgeoning offshore maritime sector in Asia, with the theme “Bringing Commercial Trends And Projections To The Forefront” this year. As the first Charterers Seminar, it is also slated to be held on April 7, on the heels of the Charterers Forum which was held in Singapore last November.



CALENDAR OF EVENTS

**SUNDAY
APRIL 6, 2014**

**MONDAY
APRIL 7, 2014**

**TUESDAY
APRIL 8, 2014**

Events in the

Singapore Maritime Week Exhibition (March 31 to April 6)

Launch of SMW 2014



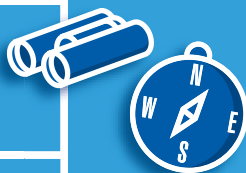
Maritime

Singapore Bunkering Symposium

Amazing Maritime Hunt



"Through Your Lens" Photo Competition (Dec 2013 to Feb 2014)



Sustainable Marine Transportation Conference 2014: Green Shipping and Ports

6th Annual Offshore Drilling Conference

5th Annual FPSO

6th Offshore Support Vessels

Oxford Bunker Course (Advanced)

LNG as a Marine Fuel

Dry Cargo Chartering

Sea Asia 2015 Launch Reception

Asia Pacific

TOC Container

ReCAAP ISC Piracy and Sea Robbery Conference 2014

Green Technologies Seminar

Events in

Seatrade Asia Awards 2014



WEDNESDAY
APRIL 9, 2014

THURSDAY
APRIL 10, 2014

FRIDAY
APRIL 11, 2014

morning and afternoon

Learning Journeys

Singapore
 Maritime Lecture

SML Networking
 Cocktail

International
 Sportsweek for Seafarers
 (April 9 to 12)



Singapore Yacht Show 2014 (April 10 to 13)

An Introduction to
 LNG Bunkering

SMI Seminar:
 Automation and
 Autonomy

Asian Maritime Law Conference

Singapore Shipping
 Forum 2014



Yachting Conference

Supply Chain: Asia

the evening

Inaugural Graduation
 Ceremony for Certificate
 of Competency
 (Special Limits)

Launch of
 Singapore Maritime
 Trails & Maritime Corner
 @ Fort Canning

Events organised
 by other parties

Events organised
 wholly or in part
 by the Maritime
 and Port Authority
 of Singapore,
 Association
 of Singapore
 Maritime Industries,
 Singapore Maritime
 Foundation and/or
 Singapore Shipping
 Association



MARITIME SINGAPORE THROUGH YOUR LENS



▸ The Singapore Maritime Week (SMW) Photography Competition 2014, held from Dec 27, 2013, to Feb 28, 2014, saw an enthusiastic response from budding and professional shutterbugs. Twelve unique photos that aptly captured this year's theme, "Maritime Singapore Through Your Lens", caught the eyes of the judging panel.



YOUTH CATEGORY WINNERS
(Aged 25 and below)

1ST PRIZE (TOP)

The Sun, Sky, Sea And Machines,
Hafiz Zailani

2ND PRIZE (ABOVE)

The Long Route Ahead, Tang Jun Hao

3RD PRIZE (RIGHT)

Stack And Go!, Hadi Azhari Ishak

MERIT PRIZES

- **Port Of Call,** Ng Joon Leng
- **The Way I See It,** Ng Lay Hiong
- **Beneath The Crane's Shadows,**
John Tan Pek Nan



OPEN CATEGORY WINNERS

1ST PRIZE (BOTTOM)

The Twin Tugs, Calvin Go

2ND PRIZE (BELOW)

Nation's Heart Beat, Mun Yong Jian

3RD PRIZE (LEFT)

Working Round The Clock,

Wong Teck Hong

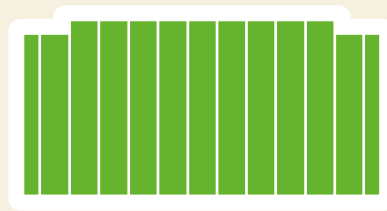
MERIT PRIZES

- Hi Ho, My Friends, Imelda Chua Kwang Mei
- Building Blocks Of Economy, Suhaimi Abdullah
- Sundown, Vickie Ng

“The SMW photography competition provides a good opportunity for photographers to **challenge themselves with the theme and capture scenes related to Singapore’s maritime industry**. It was refreshing to see how different photographers composed their photos and brought out the character of some of the iconic elements of our port, and shipping.”


Goh Kim Hui, President, The Photographic Society of Singapore





CURBING EMISSIONS

REGULATIONS AND CLEAN FUELS LIKE LNG WILL PLAY A BIG ROLE IN REDUCING THE MARITIME INDUSTRY'S GREENHOUSE GAS EMISSIONS. BY HENNING MOHN

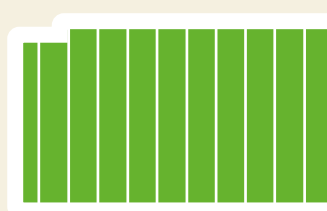


▶ Maritime transport accounts for more than 80 per cent of world trade by volume. It is also responsible for 8 per cent of the world's total oil consumption, at 4,030 million tonnes of oil equivalent, and for emitting 3 per cent of global greenhouse gas emissions.

Of the approximately 330 million tonnes of fuel consumed annually by the global merchant fleet, some 85 per cent is residual fuel with high sulphur content.

Furthermore, according to BP's Energy Outlook 2030, the world will need about 35 per cent more energy by 2030. This all translates to an immense demand on the environment, and it is more pressing than ever that the industry should address this.

The international maritime community recognises these problems and measures have already been put in place. International shipping is heavily regulated, and over the next decade, upcoming



regulations from the International Maritime Organization will limit the emissions of sulphur oxides and nitrogen oxides from ship exhaust gases, which will likely create an increased demand for low-sulphur fuels.

The world's Emission Control Areas (ECAs) have also placed tighter controls on emissions. Ships operating in these areas must use low-sulphur fuels, or put in place measures to reduce sulphur emissions, such as the use of scrubbers. Fuel consumption in the ECAs is estimated at 30-50 million tonnes of fuel a year, and looks set to increase to over 300 million tonnes of fuel a year if more areas are included after 2020.

Other regulations include ensuring that ships meet energy efficient standards in terms of greenhouse gas emissions. Meeting all these requirements is technically feasible, but can be very costly and may lead to significantly higher pricing of low-sulphur fuels.

Future solutions

Consequently, the shipping industry will also need to turn to alternative fuels that are sulphur-free. Some of these include liquefied natural gas (LNG), liquefied petroleum gas, methanol and ethanol, hydrogen, biodiesel and nuclear fuel. So far, only some have proven effective, but all continue to be studied for their physical and chemical characteristics, production methods, availability and cost, applications in the maritime sector and current status, safety considerations, and emissions and environmental impact.

For example, alternative liquid fuels such as methanol and ethanol have been found to produce lesser emissions of nitrogen oxides and particulate matter, and are sulphur-free as well. These liquid fuels can be used in dual fuel engines as substitutes for oil. Swedish manufacturer Scania uses ethanol with an additive to make it suitable for heavy-duty diesel engines. But while methanol's low flashpoint means that its safety requirements are similar to LNG, it is toxic

when it comes into contact with skin or when inhaled or ingested.

The use of biofuels, which come from edible crops, non-edible crops (such as waste) and algae, can reduce greenhouse gas emissions. They biodegrade and break down quickly, which means that they are less of a risk to the marine environment in the case of an oil spill. Biofuels can also be mixed with conventional fossil fuels to power conventional internal combustion engines. The US Navy uses algae-based fuels, as does Maersk Line, which is also involved in fuel development research programmes. However, there are issues with sustainable and efficient production, cost, long-term storage stability, and corrosion. Regulatory issues also exist, such as with the MARPOL Convention and ISO standards.



A view for the long term

DNV GL researchers recently compared the different fuels along the energy value chain to evaluate their impact, in what is known as "well-to-propeller" analysis. Its studies show that LNG is the first and most likely alternative fuel for shipping in the future. It can power both gas engines and dual-fuel engines. And because it produces zero sulphur oxide emissions as well as decreased levels of nitrogen oxide, particulate matter and greenhouse gas emissions, LNG is a very viable option for shipowners with vessels in ECAs. While issues such as bunkering infrastructure

and high capital cost of system installation remain, the adoption of LNG is expected to grow significantly. This can be seen in the fact that more LNG-powered ships are being manufactured – there are currently close to 100 LNG-fuelled ship projects worldwide. LNG bunkering is also being introduced in China, Europe and the Americas. There is an urgent need, too, to put the proper LNG operational procedures and training programmes in place.

Singapore, for one, is being keenly watched in Asia for the development of LNG bunkering operations standards, which are being overseen by the Maritime and Port Authority of Singapore. Already, a new LNG initiative in the Republic has been established, with Temasek's Pavilion Energy investing S\$800 million in LNG in the Asia-Pacific.

Conclusion

New fuel alternatives are now available to improve sustainability in the shipping industry in the future, and LNG is the most developed. The main drivers are the upcoming regulations curtailing sulphur and nitrogen oxide emissions, the relatively low cost of LNG in the United States and Europe, and the rise of shipping activity in China. These winds of change come during a period when the financial outlook for the shipping industry is bleak, with challenging market conditions and high fuel costs putting a strain on many industry players. More alternative fuel types will come, but LNG seems to be the best possible solution for now. Singapore can take a strong first-mover advantage in this change, and benefit from it, especially with the development of LNG bunkering standards and its industry cluster of world-renowned maritime environmental technology companies.

The contents of this article are adapted from a speech given by Henning Mohn, Head of Section, Shipping Advisory, DNV GL Singapore, at MPA's Singapore Registry of Ships (SRS) Forum in December 2013.

A NEW CHEMICAL TANKER POOL IN SINGAPORE IS SET TO MAKE WAVES.

DENYSE YEO FINDS OUT MORE.

UNITED BY
SHARED
VISION
AND COMMON
GOALS



► In recent years, the maritime industry has faced many challenges. With the shipping sector also experiencing issues like slow demand, companies are starting to work together, pooling their resources and expertise for mutual support in these challenging times.

Two established shipping companies have done just that. On the back of strong growth in liquid chemical shipments, Tokyo Marine Asia and Jo Tankers entered a 50-50 joint venture in the form of Milestone Chemical Tankers, a chemical tanker pool that was set up in Singapore last September.

With a combined staff strength of 70, Milestone manages the chartering and operations for all the vessels currently under the operations of the two companies. The chemical tanker pool includes 65 vessels – 52 from Tokyo Marine, and 13 from Jo Tankers.

Yoichi Aoki, Managing Director of both Tokyo Marine Asia and Milestone, says: “With trade volume of liquid chemicals worldwide expanding so rapidly, more vessels are needed to cater

to this increased quantity, as well as to the different types of liquid chemical shipments made around the world.”

To meet this expanding demand, Singapore-headquartered Tokyo Marine had considered increasing its fleet. “The company decided against the move because it would have taken too much time to achieve,” says Aoki, adding that a tanker takes about three years to build.

“We decided that our best move would be to establish a tanker pool with another company, so as to widen the fleet,” he says.

For Nils-Petter Sivertsen, CEO and President of Jo Tankers, the decision to establish a tanker pool was an easy one to land on. Sivertsen says: “We

spent years finding the ideal partner and evaluating many alternatives. Our motivation was that we wanted to become a global company to serve our customers worldwide.

“During the evaluation we found that Tokyo Marine was the ideal fit. They share the same values as us when it comes to safe operations, the environment, and long-term strategy. We also saw that both parties were flexible in finding the best solutions for Milestone customers.”

MORE ROUTES, DIVERSIFIED FLEET

The two companies complement each other in many ways. For one thing, the joint venture means that Milestone can take on a larger number of shipping routes. Tokyo Marine specialises in



routes in the Pacific and Indian Oceans, and between Asia and Europe, while Jo Tankers operates routes from Europe to the US, and Africa.

In addition, Sivertsen considers the merger an ideal operational fit because the companies own different kinds of vessels.

"Some of the fleet categories are the same when it comes to size and capacity, but Jo Tankers also contributes with large chemical tankers with more segregation, and Tokyo Marine through large vessels with less segregation and with smaller vessels. Through Milestone, we are becoming a global operation with a more diversified fleet," he says.

The two organisations do not have specific allocated

roles to play in Milestone. Instead, they will be working together with a shared vision, towards the same goals, says Aoki. Sivertsen also feels that, for now, their priority is to ensure a smooth, efficient transition, and to establish Milestone as a global operation with its head office in Singapore and regional offices and operations in Europe, the US, and Asia.

He says: "In many ways, we are two different organisations, and come from different cultures, but our common goals have united us. Both organisations are very motivated and work very well together."

A CHOICE LOCATION

One common understanding both

companies came to was the clear choice of Singapore for Milestone's headquarters. Says Sivertsen, "Singapore, as a global centre for shipping activities, presents us with an efficient and conducive business environment."

Aoki's take on Tokyo Marine's decision to relocate its headquarters from Japan to Singapore in 2012 is that "Singapore is a strategic location for expanding its business, especially as its major customers have offices here".

"As a shipping hub, the country also has abundant and competent human resources, particularly in ship

management," he adds.

Even with its strong position, Milestone is not immune to future challenges. It faces the issue of sustaining profitability within the chemical segment, which Sivertsen says has been "unsatisfactory for years".

"However, despite low returns on invested capital, we see significant interest from various new players in the segment, who are contracting new vessels in China and Japan. The only way we can respond to this potential overcapacity is to operate more efficiently, and on a global basis. This is why I feel that Milestone will be the key to success," Sivertsen says.



Managed by

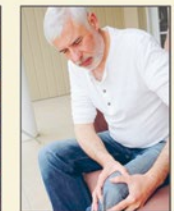


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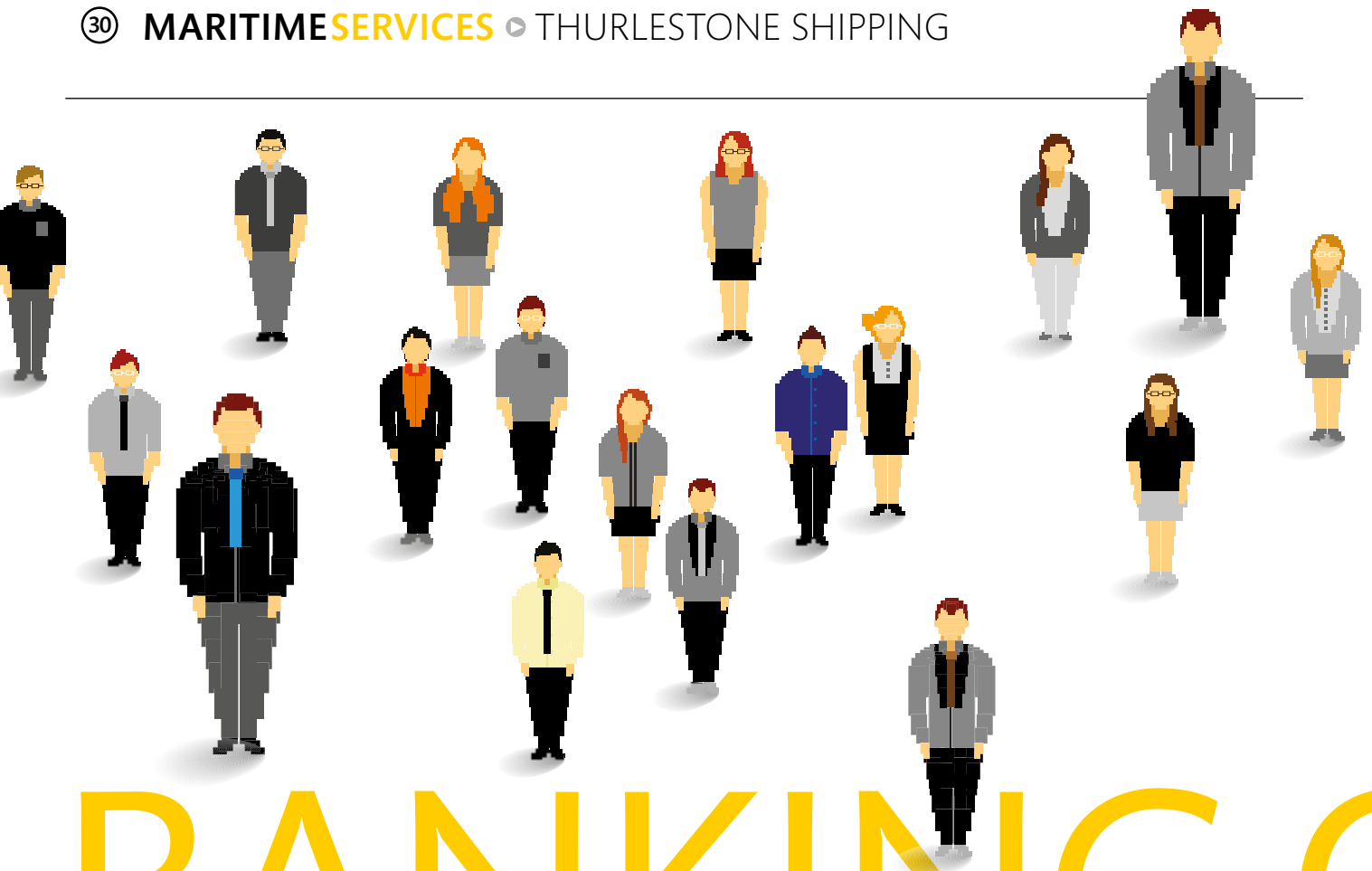
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BANKING C

THURLESTONE SHIPPING'S TONY FANECO TELLS NICHOLAS YONG THAT HAVING

► Within a decade from its establishment in 2004, shipbroking firm Thurlstone Shipping has set up five offices worldwide, and its Australian Managing Director, Tony Faneco, says that their success is largely due to an attention to detail.

"Shipbrokers are intermediaries who can be regarded by many people as performing a role comparable to the work of a real estate agent," notes the 44-year-old.

"At Thurlstone, we conduct shipbroking in a meticulous way, by knowing our customers' businesses, and then providing them with the service that is absolutely essential – quality

documentation and back office or follow-up services."

Singapore-bound

Thurlstone Shipping provides services like dry cargo shipbroking for vessels such as capesize, panamax, and handysize, coupled with consultancy services. Operating out of London, Monaco, Beijing, Melbourne, and Singapore, the company employs about 90 staff worldwide. The Singapore office alone has grown from just two staff – when it first started – to about 30 people currently. It has also successfully diversified from a single focus on capesize business to include all of the

dry bulk sizes, and Faneco regards this as a key milestone for the company.

Explaining how Thurlstone attempts to set itself apart from the rest, Faneco says: "We focus on those services that other shipbrokers wouldn't necessarily spend their time on. I think that's one significant way that we differentiate ourselves from the competition."

The company, which was originally headquartered in London, set up operations in Singapore in April 2008 as they wanted to be in closer proximity to clients such as Rio Tinto, Fortescue Metals Group, and other owning and cargo interest companies who were taking

advantage of developments in Singapore. Thurlstone also foresaw that Singapore would attract capesize growth, and wanted to pioneer capesize shipbroking here.

"Everybody is in Singapore now. The Maritime and Port Authority of Singapore and other governmental bodies have done a tremendous job in attracting mining businesses, shipowners, product traders, and others. As a result, a lot of chartering activity has come to Singapore," says Faneco.

A decade ago, Faneco would have had to travel to cities such as Geneva, Amsterdam, and Paris in order to see his clients. Now, with Singapore being a global hub



ON TALENT

QUALITY STAFF AND A KEEN EYE FOR DETAIL ARE KEY TO MAINTAINING SUCCESS.

for numerous industries, he is able to meet clients such as Cargill and BHP Billiton, which have also relocated to Singapore, without having to take lengthy flights.

"I can visit many clients, all in an afternoon, if I choose to. This is part of the appeal of being in a country where many of our clients are based – it's easier to do business sitting face to face, rather than over the phone, or having to travel to have a face to face meeting," says Faneco.

Talented manpower

Another factor that makes Singapore such an enticing place to do business is the steady supply of graduates

with sound knowledge of commercial shipping. Faneco also commended the quality of the undergraduates who have been doing internships at Thurlstone in recent years.

On the topic of talent, Faneco adds that Thurlstone's quality manpower has been key to its success. One of the company's top priorities is recruiting the right personnel, and giving them the best training. Most importantly, Thurlstone works hard to ensure that these talents stay with the company.

"It's deflating to have staff moving in and out of a service-offering organisation – the consistency of service ends up being compromised," notes

Faneco, before referring to the turnover rate in the industry.

Thurlstone's emphasis on deploying the right personnel is underscored by the three-year training period that all new recruits must undergo before they are regarded as full-fledged shipbrokers.

Recalling his experience as a novice shipbroker back in the 1990s, Faneco says: "For several years, my boss did not allow me to do anything other than draw up charter parties and send orders around. That is because the maturity level, level of knowledge, and understanding of the broker's market needed to be of a certain standard. We still agree with that philosophy."

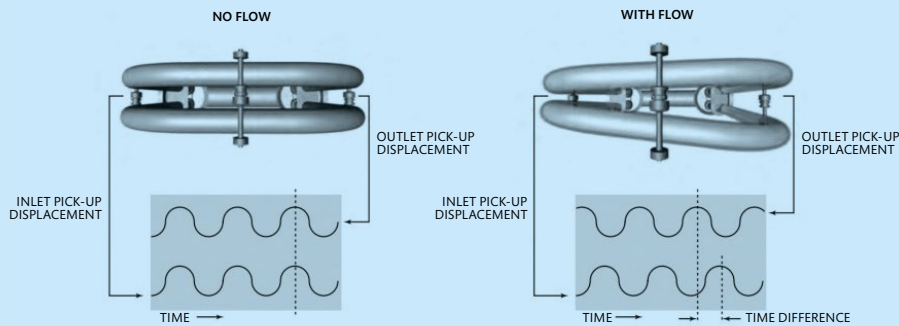
Faneco revealed that Thurlstone Shipping is looking to at least double its panamax and handymax teams this year, while increasing back office services to those broking roles.

Not surprisingly, he adds that one of the company's most pertinent challenges in the near future pertains to the recruitment and retention of capable personnel.

Explaining that every market the company is involved in has grown in volume, he says: "The drain on existing manpower resource is larger than it has ever been.

"We need to ensure that we have a ready pool of quality people to ensure similarly quality service."

LEDIATI TAN EXPLAINS HOW THE MASS FLOW METER WORKS, AND HOW IT BENEFITS THE BUNKER INDUSTRY, AS SINGAPORE PROMOTES ITS USE WITHIN THE MARITIME COMMUNITY.



FLOWING TO THE FUTURE

◉ In recent years, the Maritime and Port Authority of Singapore (MPA) has been actively promoting the use of mass flow meters in the bunkering industry.

As the world's largest ship refuelling centre, Singapore's move towards encouraging the use of mass flow meter technology is likely to have a significant impact, and transform the way the bunkering industry operates.

Says Dr Parry Oei, Director, Port Services, MPA: "The adoption of mass flow meters will help ensure that vessel operators get what they pay for, as well as ensure fair trading conditions, thus promoting a more level playing field in the bunkering sector.

"The use of mass flow meters also aims to increase the overall efficiency and transparency of bunker fuel transfer processes in Singapore. This will also give rise to long term optimisation of port capacity, port efficiency, port productivity, and a reduction in administrative processes."

Traditional measures

The use of mass flow meters, which make fluid measurements based on mass and not volume, marks a departure from traditional

quantity measurements using tank gauging or sounding. Conventional measurements are not only relatively time consuming, but can also lead to uncertainty due to error-prone volume-to-mass calculations, as well as variable air content in the fuel caused by tank stripping and the "cappuccino effect" – a bubbling effect that takes place when compressed air is mixed into the fuel.

Rising fuel costs, price volatility of marine fuels, and the fact that the cost of bunker fuel forms a big part of voyage costs, mean that any inaccuracies in measurement during bunkering may lead to lengthy bunker disputes as large sums of money are usually involved.

Benefits

As the mass flow meter directly measures mass instead of volume, any error in conversion from volume to mass is completely avoided.

"The use of mass flow meters aims to overcome many problems associated with traditional methods of measurement, and has been proven to be transparent and accurate, saving both bunker operators and shipowners time and money," adds Dr Oei.

This helps shorten the ship

HOW IT WORKS CORIOLIS EFFECT

Also known as a Coriolis flow meter, or an inertial flow meter, the mass flow meter is able to make fluid measurements based on mass, and not volume.

As fluid enters the device in a dual curved-tube meter, the flow is evenly divided into two parallel tubes. The measuring tubes are made to oscillate, thus balancing each other.

When no fluid is flowing through, the two tubes oscillate evenly in phase with each other. But when fluid is flowing, the Coriolis effect causes the tubes to twist and the resulting oscillation in the two tubes to be out of phase.

Special sensors pick up this phase difference, and use this to determine the mass flow rate. From this, the mass quantity that has flowed through the instrument during a particular time interval (eg a bunkering operation) can be calculated.

refuelling process by two to three hours. The meter can also detect air trapped in the fuel, thus more accurately reflecting the amount of bunker fuel that was transferred.

During bunkering, the mass flow metering system quickly reports any irregularities in real-time so that the crew can intervene and take action before the refuelling process is completed. System integrity is also ensured as the device is protected from tampering.

Since the mass flow meter contains no moving parts, it does not require maintenance. It is also equipped with an intuitive control panel that is easy to use.

In 2012, an ExxonMobil-chartered bunker tanker became the first vessel in Singapore to use a mass flow metering system approved by the MPA for bunker fuel

transfers. To date, three of ExxonMobil's chartered bunker tankers in Singapore have been equipped with approved mass flow metering systems, saving their vessel operators up to three hours and over S\$7,000 each delivery.

So far, MPA has approved two vendors, Emerson Process Management and Endress+Hauser, to aid its objective of encouraging the use of mass flow meters in Singapore's bunkering industry.

Both companies are global leaders in measurement instrumentation for industrial process engineering. Emerson Process Management owns the brand Micro Motion, which was involved in the implementation of the first practical Coriolis flow meter, while Endress+Hauser is a Swiss family-owned business founded in 1953.

The adoption of mass flow meters will help ensure that vessel operators get what they pay for, as well as ensure fair trading conditions.

DRIVEN BY PASSION

JAMIE EE SPEAKS TO PROJECT
AND DEVELOPMENT
MANAGER CELESTE YEONG
ABOUT WORKING ON THE
MASS FLOW METERING
SYSTEMS ON VESSELS OWNED
BY SINANJU TANKERS.



► With more than a decade of experience in the maritime industry, project and development manager Celeste Yeong is able to deftly handle the intricacies of new projects at Sinanju Tankers, a Singapore bunker craft operator. She tells *Singapore Nautilus* how she rose to the challenge of implementing a new mass flow metering system for the company's bunker tankers.

What is a typical workday like for you?

My workdays are usually packed with meetings and getting updates on our vessels. I am also part of a working group for mass flow metering, formed by Maritime and Port Authority of Singapore (MPA) and SPRING Singapore, to develop a framework for mass flow meters in bunkering operations. I spend the rest of my time reviewing and approving purchase orders,

going through issues with our technical staff, as well as studying vessel drawings as part of research.

Tell us about your role in Sinanju Tankers.

My primary role is to source and purchase marine parts for our fleet, which consists of eight bunker tankers. To support this, I work with many external vendors and suppliers who are located in Singapore and overseas.

Some of our vessels sail into foreign waters, so sometimes additional equipment is needed in order for them to meet entry requirements. For

example, as part of anti-piracy measures, I might look for special equipment such as anti-blast window film and razor wires to protect the vessel with.

You have worked on the mass flow metering system in your company. Can you tell us more about the project and your involvement?

In 2009, we installed our first mass flow metering system onboard one of our tankers as part of a trial initiated by MPA.

Back then, mass flow meter technology was still very new to the local marine industry. Since I was tasked to oversee its implementation for our vessels – from selecting the meter to getting MPA's approval of the system – I spent a lot of time studying the meters and vessel drawings, as well as going on board the ship to see how best to install the system and ensure its smooth running.

The actual fitting of the meter takes only five days, but the entire planning and approval process takes about six months.

Two of our tankers received MPA's approval for their systems last year. It was most satisfying when we crossed this milestone. Another tanker was retrofitted with the system in early 2014, and is currently undergoing trials.

What have been some of the challenges you have faced on the job?

One challenge I faced while working on the mass flow meter project was making sure I had a thorough understanding of the system's technicalities.

Since our first installation, we haven't faced any major issues with subsequent installations.

Another challenge is the unpredictability in working on such a project. Sometimes I go on board vessels to supervise the meter's installation and official trials. Twice, I was held up in our ship for about 56 hours because of security clearance issues with the shipyard. I even slept in the mess room, where the crew has their meals!

What advice would you give to someone who is considering a possible job in this field? What skills would they need?

I believe in continuous learning. Just last year, I completed my Master of Science in Marine Technology (International) from the University of Newcastle Upon Tyne.

Another key to enjoying a job in this field is to have passion. Passion will help anyone through difficult times, especially in a job like mine, where the hours might not be very predictable.

What do you do in your spare time?

I go on hiking trails at MacRitchie, Punggol and along Singapore's park connectors. I also volunteer at an old folks' home when I can find some free time on weekends. Sometimes, I visit the library to read up on new marine technology and learn about the different types of calibration for mass flow meters. I believe in continuous learning as it broadens my knowledge of the maritime field.



MARITIME



GLAMOUR

► The Singapore Yacht Show will be back again this year and visitors can expect to be treated to some maritime glitz and glamour at ONE°15 Marina Club at Sentosa Cove from April 10 to 13.

Held in conjunction with Singapore Maritime Week 2014, the event hosts Asia's largest showing of superyachts and boats, and this year's

participants include the stunning motor yacht *Exuma*, an award-winner that clinched the 2012 Asia-based Charter Yacht of the Year Award.

The show will also mark the Asian debut of the motor yacht *Cloud 9* by CMN Yachts. This vessel boasts features like an inflatable slide, jacuzzi, luxurious cabins, and jet skis.

Visitors can expect more

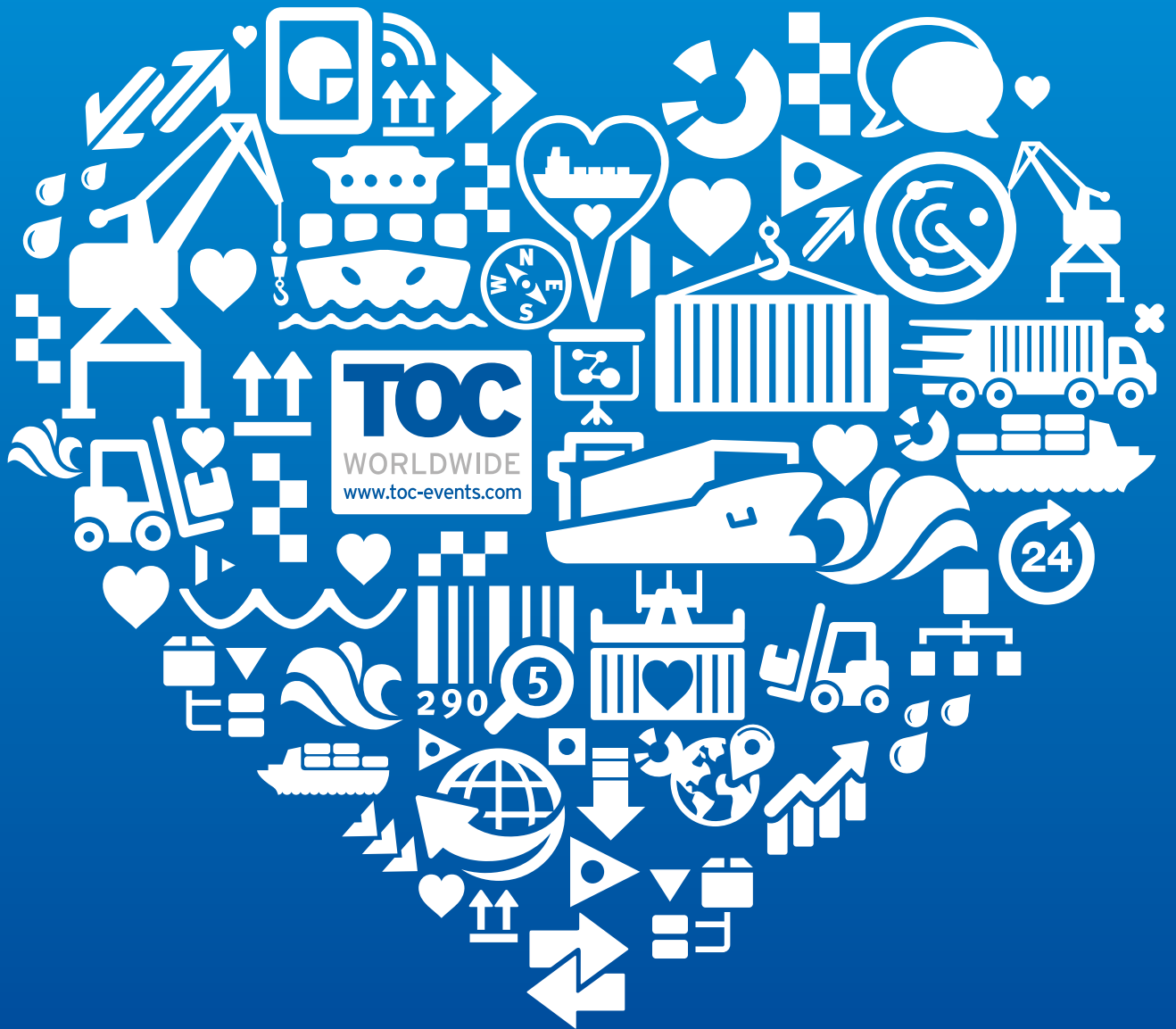
on-water display space this year as the show's list of leading international exhibitors continues to expand. For the first time, world-renowned brands such as Alloy Yachts, Lurssen, Edmiston & Company, Perini Navi/Picchiotti, Philippe Briand, and Porto Montenegro will be exhibiting at the show.

Apart from boats and yachts, visitors can also

look forward to a festive atmosphere along Quayside Isle in Sentosa, and view luxury goods such as classic and modern supercars, as well as works of fine art.

ABOVE: Visitors will get to see the *Cloud 9* up close at the Singapore Yacht Show. The superyacht, which was built in 2009, is available for charter under Burgess from €315,000 (\$554,000) a week.

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