

WAVES



Steering Sustainability in Shipping

HIGH
EMISSIONS



LOW
EMISSIONS



MariApps' Digital Solutions for the Offshore Industry



Decline in oil prices, the global energy transition, and acceleration in technology such as: Industrial Internet of Things (IIOT), cloud computing, and AI have affected the Offshore industry. Therefore, to ensure resilience in the Offshore sector through digitalization, the right technology must be implemented to deliver business value and impact in the industry.

Offshore vessels have a different propulsion system compared to the merchant fleet by using, for example, four engines to produce electricity which powers two azimuth thrusters in the aft and three thrusters in the bow. New offshore vessels are equipped with additional batteries to store the produced energy and feed it to the grid once needed. Depending on the operation and the weather condition, the crew can switch off engines and use the battery to save fuel and emissions.

The purpose of offshore vessels with a Dynamic Positioning System (DP) is to stay in a position set by the crew e.g. next to an offshore structure or during subsea operations. If the vessel is pushed away by wind or waves, the vessel moves back to the set position by itself. Hence station keeping is another important KPI to measure.

MariApps is constantly developing innovative digital solutions their clients require to achieve compliance, operational optimization, increase overall efficiency, and advance maritime digitalization. MariApps developed software that receives the raw data collected by a data collector system on the vessel and provides several graphs to analyze the performance of the vessel in regards to DP operations, fuel efficiency and mitigation of emissions. In addition, the software will allow shore personnel like superintendents to follow the vessels operation and support the crew with their expertise.



Maintenance



HSEQ



Purchase



Accounts



Sales & Projects



Crewing

QDMS WIKI



Office HR



To know more about digital solutions from MariApps, please visit www.mariapps.com or contact Khalil Rehman Aziz: khalilrehman.aziz@mariapps.com

Foreword

Dear members,

As the year draws to a close, we are pleased that the SSA-led industry SEAVAX initiative has enabled ocean-going seafarers of any nationality, signing on in the Port of Singapore, to apply and receive their COVID-19 vaccinations here. This milestone achievement comes after months of mutual engagement between the industry and the authorities, underscoring that a collaborative approach will be required to battle the ongoing and evolving pandemic situation.



Singapore is also looking ahead to the issue challenging not only the maritime sector but the world as a whole. Namely, how we can achieve a net zero and carbon neutral future. The G20 summit and COP26 were both global forums for discussion but we in Singapore have also been formulating our plans.

The recently established Global Centre for Maritime Decarbonisation (GCMD) is tasked with helping the maritime industry to eliminate its greenhouse gas emissions. In this issue, GCMD Chief Executive Officer, Professor Lynn Loo, shares some of the initiatives already underway and also looks to future innovations.

Carrying on the theme of decarbonisation, SSA, along with the Maritime and Port Authority of Singapore and Global Compact Network Singapore, has signed a Memorandum of Understanding to support Singapore's maritime companies in developing their carbon reporting, monitoring and reduction. You can read more about this initiative in the Technology section of Waves.

Although shipping undoubtedly faces testing times ahead, the SSA Council believes that with a well-developed strategy, we will be able to navigate the future. The pro-active stance taken by SSA, Singapore Maritime and other global organisations is a source of great optimism.

I wish you all a safe and happy festive season and look forward to meeting up with many of you in person in 2022.

René Piil Pedersen

SSA Vice President & Honorary Secretary,
General Affairs Committee Chairman

THOUGHT LEADERSHIP



TECHNOLOGY



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Developing low
carbon and zero
carbon
emissions
technologies

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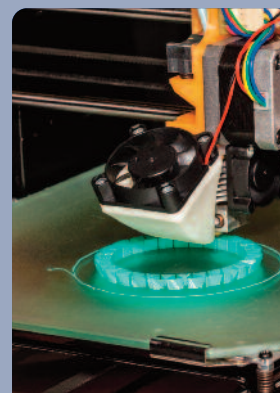


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Notice to all SSA members – stay in contact

As you are aware, the SSA Secretariat often sends out email circulars to inform you, our members, of SSA's events and the latest developments in the industry. We have noticed that some of you may not be receiving the email circulars sent out by the SSA Secretariat – as your office email server may have classified our emails as spam.

To resolve such issues, kindly include SSA's domain name ssa.org.sg into your email whitelist/safelist so that you remain in our communication channel. Thank you for your kind attention.

Event Calendar

November

sun	mon	tue	wed	thu	fri	sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November 2021

- 03/11** SSA Alternative Marine Fuels Sub-Committee Webinar on Hydrogen
- 03/11** Maritime Digital Challenge (MSC)
- 08/11** E&Y, SNEF, SSA, WSG Joint Webinar - How to Approach Job Redesign at Your Workplace
- 10/11** SSA Tech Talk Thursday
- 18/11** Achieving Net Zero Emissions in the Maritime Sector (SCMA)
- 23/11** SPC2021 Grand Finals (PIER71)
- 24/11** SSA Alternative Marine Fuels Sub-Committee Webinar on Methanol
- 25/11** YEG Virtual HIIT for Charity

December

sun	mon	tue	wed	thu	fri	sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

December 2021

- 02/12** YEG Online Japanese Whiskey Appreciation Workshop
- 10/12** SSA Round Table - Shaping Views: business insights & legal implications of carbon credits for shipping companies
- 13/12** The road forward for the Maritime Industry After COP 26 Webinar (NBAS)
- 16/12** YEG Virtual Christmas Cocktail Networking Night
- 17/12** SSA Tech & Demo Day
- 23/12 - 03/01** SSA Year-end office closure

January

sun	mon	tue	wed	thu	fri	sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

January 2022

- 13/01** SMF New Year Conversation
- 13/01** SSA Tech Talk Thursday
- 31/01 - 04/02** SSA Office Closure - Lunar New Year

* Information subject to change

Thinking Outside the Box

We interviewed the Chief Executive Officer of the recently established Global Centre for Maritime Decarbonisation (GCMD) based in Singapore. Professor Lynn Loo took up her position in August and was pleased to share with us the initiatives already underway.



Could you tell us a bit about your career and how it has led you to your current position as CEO of the Global Centre for Maritime Decarbonisation?

I am a chemical engineer by training and have been a professor at Princeton University for the past 15 years where my research is focused on developing new materials for making emerging solar cells, more specifically, solar cells that can be integrated into windows. Prior to taking on my role at GCMD I was additionally director of the Andlinger Center for Energy and the Environment where the centre focused on studies about energy systems and the transition necessary as the world moves from a carbon intensive economy to one of low carbon.

I came to Singapore in January 2020 for my sabbatical and joined the International Advisory Panel for Maritime Decarbonisation, a panel established by the Singapore Maritime Foundation (SMF) in conjunction with the Maritime & Port Authority of Singapore (MPA). The group

Our mission is to help the industry eliminate its greenhouse gas emissions and we will be doing this in a number of ways.

was charged with thinking about decarbonisation pathways for the industry with a focus on action. With more than 30 members, from shipping companies, port operators, academia, class societies, insurance and finance players, energy companies, engine makers, shipyards, shipping associations, and government, we were able to crystallise nine recommendations, one of which was the establishment of a centre in Singapore to coordinate regional efforts with global outreach.

Q Could you give us a brief overview of the GCMD and its remit?

The recommendation to establish the GCMD was submitted to the Singapore Government and, during Singapore Maritime Week, the then Transport Minister, Ong Ye Kung, announced support for such a centre to be set up. Six key industry members immediately stepped up to become founding partners of the Centre, each contributing S\$ 10 million and their contributions were matched by MPA, giving GCMD a war chest of S\$ 120 million. The founding partners are BHP, an Australia-based mining company with shipping operations; BW Group, Eastern Pacific Shipping, and Ocean Network Express, all of which are shipping companies; DNV Foundation which is a classification society and Sembcorp Marine, a shipyard. Together with MPA, we have good representation across the industry and access to the regulators.

Our mission is to help the industry eliminate its greenhouse gas emissions and we will be doing this in a number of ways. We will be shaping standards - through our connection with MPA, we have access to regulators. We will be deploying solutions, so lowering the barriers to commercialisation. And we will be conducting pilots and

trials to facilitate adoption, and fostering collaboration across sectors.

Most of the maritime sector's carbon emissions are Scope 1 – meaning that they are a result of burning fuels. While a number of steps can be taken to move towards decarbonisation: detune engines to better utilise fuel by burning it at a slightly different temperature; employ a waste heat recovery system; apply coatings to the hull to make the ships more hydrodynamic, these measures alone will not get us to the IMO 2050 target. To significantly reduce carbon emissions, alternative low- and zero-carbon fuels will need to be part of the portfolio of solutions. This is why GCMD is prioritising pilots and projects that can enable the development and deployment of such fuels.

Q You say that you are prioritising new fuels – are there any in particular which are being investigated?

To generate green fuels, we will need green hydrogen, which comes from electrolysis with renewable electricity. This green hydrogen is then reacted with nitrogen to generate ammonia, or with captured carbon dioxide to produce carbon-containing green fuels like methanol. In this respect, green ammonia is more efficient to produce than the carbon-containing green fuels. It is for this reason, we started looking at ammonia. This is not to say that we aren't looking at other green fuels. We are just starting with ammonia first.





To significantly reduce carbon emissions, alternative low- and zero-carbon fuels will need to be part of the portfolio of solutions. This is why GCMD is prioritising pilots and projects that can enable the development and deployment of such fuels.

We recently announced an Invitation for Proposals (IFP) which we are super excited about and we are really heartened by the response we have received from industry thus far. This IFP looks to define the safety and operations envelope for an ammonia bunkering pilot.

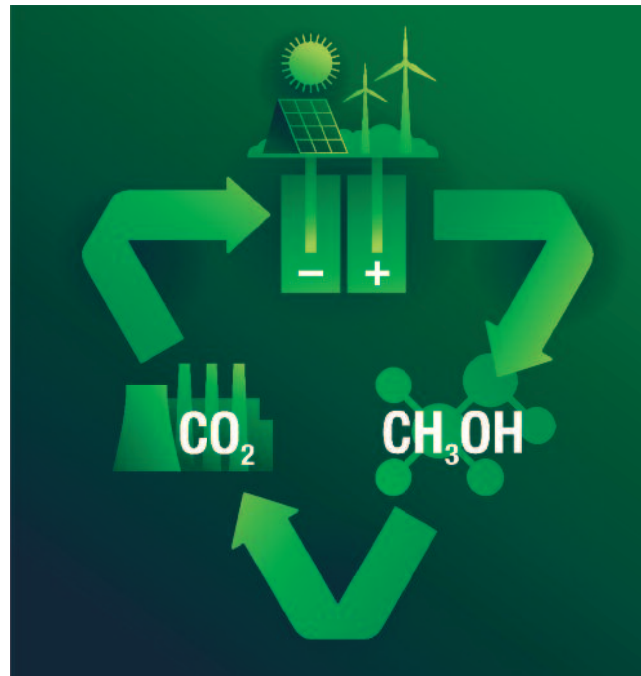
Although a common chemical, ammonia has not been used as a fuel. In fact, the first ammonia engine is being built as we speak, as is the first ammonia-fuelled ship. Adding to this uncertainty is the fact that ammonia is toxic. So we need to specify how to safely handle and move ammonia from one place to another in order for it to be widely deployed as a marine fuel.

Ammonia is a precursor to fertiliser and, as such, is shipped around the world but the volumes, the transfer frequency and the circumstances by which it will be used as a bunker will be quite different. Used as a chemical, ammonia is

largely land based, contained in a robust infrastructure with fixed pipes, whereas bunkering ammonia will require us to have modularity and flexibility not previously needed. For example, when a bunkering vessel approaches another ship for refuelling, there are numerous safety and operational concerns that need to be considered and addressed. These run the gamut from the ship and refuelling hook-ups to the fuel temperature and pressure during transfer, and training for the operators, etc. So, this study is being commissioned to address all these and more. With these specifications defined, we hope to initiate a pilot project for bunkering ammonia in Singapore.

Singapore is an ideal location for such a pilot. It has a crowded port which sees on average 1000 ships daily and is also a very population-dense island with people living very

To generate green fuels, we will need green hydrogen, which comes from electrolysis with renewable electricity. This green hydrogen is then reacted with nitrogen to generate ammonia, or with captured carbon dioxide to produce carbon-containing green fuels like methanol.



close to the ports. As such, Singapore already operates on very stringent safety and technical standards. If we can successfully articulate the regulatory sandbox for piloting ammonia here, it is highly likely that this sandbox will be applicable and extensible to ports elsewhere.

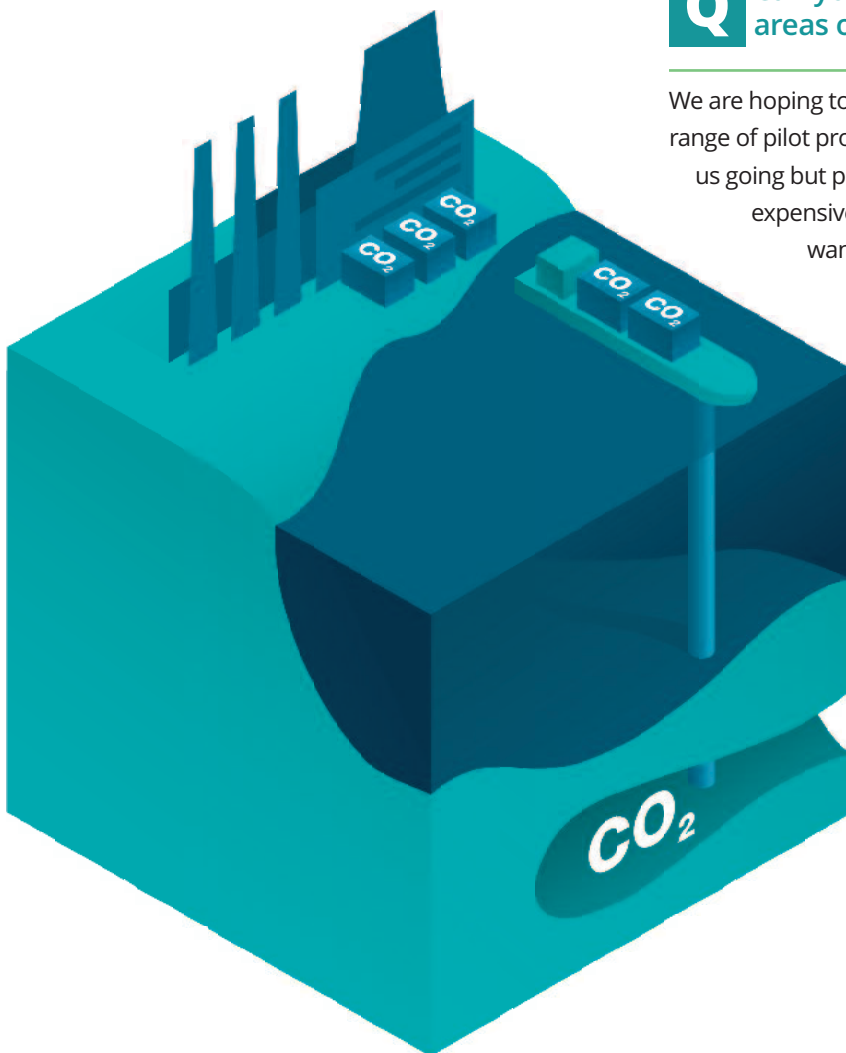
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We are certainly thinking beyond fuels! We are also looking at other technical and operations measures with significant emissions abatement potential, and how we can help lower



the adoption barriers for these solutions. In considering projects, collaboration is so important and the whole is going to be greater than the sum of the individual parts. In addition to working with stakeholders across the supply chain, we are looking at ways to collaborate with parallel

If carbon capture and sequestration works at scale, transporting CO₂ could be a new business opportunity for the maritime sector. So, we need to think outside the box.



sectors, like aviation. Aviation shares many similarities with the maritime sector; the challenges and opportunities for decarbonisation are in many ways comparable. And, because Singapore is both a maritime and an aviation hub, there is a confluence of factors that would make sense to think about a collaboration between the two.

We are also thinking about collaborating with the oil and gas sector because our Scope 1 emissions are their Scope 3 emissions (indirect emissions that occur in a value chain). As an example, are there opportunities to collaborate when it comes to negative emissions technologies? If carbon capture and sequestration works at scale, transporting CO₂ could be a new business opportunity for the maritime sector. So, we need to think outside the box.



Can you share with us any of the other areas of research you are considering?

We are hoping to fund raise so that we are able to support a range of pilot projects. The war chest that we have will get us going but projects of this sort are going to be expensive and more funds will be needed if we want to continue to do them. We are not going to solve this challenge overnight, yet time is of essence. We will leverage our strengths and work with industry stakeholders to accelerate the adoption of low-carbon solutions were we to meet the goals of decarbonisation.

The war chest that we have will get us going but projects of this sort are going to be expensive and more funds will be needed if we want to continue to do them.

HIGH
EMISSIONS



LOW
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Carbon Management: How to Get Started and Reduce Operating Costs

This article is contributed by the Carbon Pricing Leadership Coalition (CPLC) Singapore. CPLC Singapore is the decarbonisation arm of Global Compact Network Singapore (GCNS).

With climate change affecting all industries, the global drive to decarbonise is imperative. Major economies such as the United States, European Union and Japan have pledged to achieve net zero emissions by 2050. The International Maritime Organisation (IMO) has also set ambitious targets to reduce emissions by at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008. Major global shippers, charterers and customers along the value chain are also increasingly demanding for sustainability to be included in tenders and contracts.

As one of the world's major shipping hubs, these trends present a unique opportunity for Singapore to gear up her local shipping industry to align with the emerging low-carbon global economy.

In September 2021, the Maritime and Port Authority of Singapore (MPA), Singapore Shipping Association (SSA) and Global Compact Network Singapore (GCNS) signed a Memorandum of Understanding (MoU) to jointly support Singapore maritime companies in developing their capabilities in carbon reporting, monitoring and reduction, and to recognise companies for managing their emissions.

The MoU supports and enhances the Singapore Green Plan 2030, in which a key pillar includes helping companies, especially SMEs, build capabilities in

sustainability and seize opportunities in the emerging green economy.

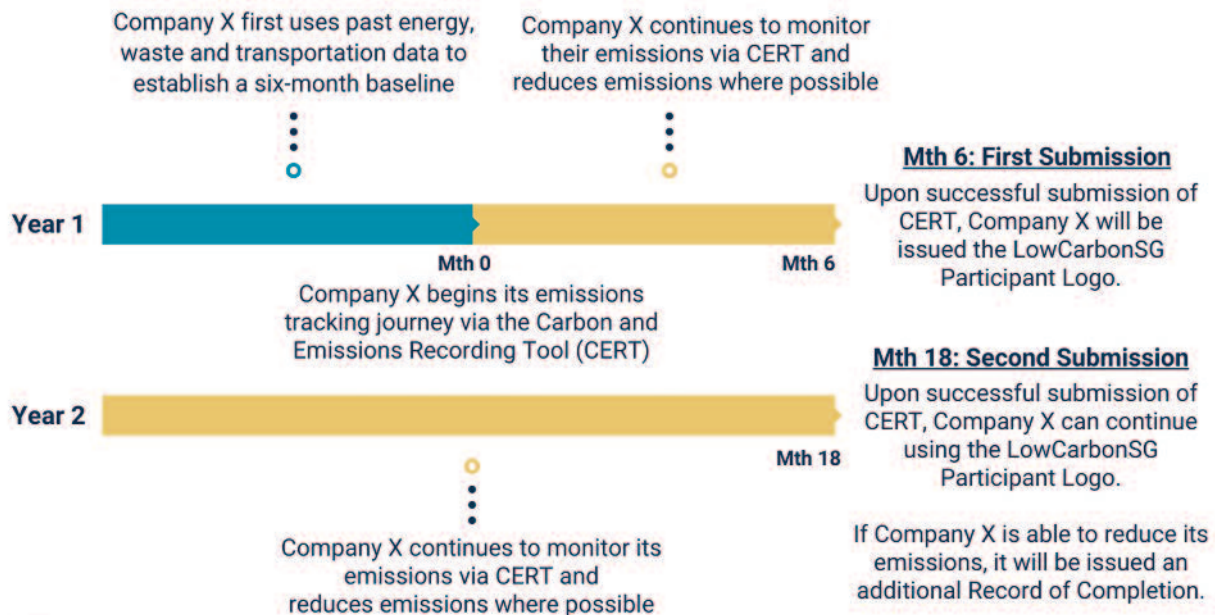
Kick-start your Decarbonisation Journey with LowCarbonSG

LowCarbonSG is a capability-building programme to enable businesses nationwide, especially SMEs, to start monitoring and, where possible, reduce their carbon emissions. During the 18-month programme, businesses will learn to use the Carbon & Emissions Recording Tool (CERT) to monitor their emissions, and take actions to reduce both their emissions and operating costs.

Announced on 26 October 2021 by Ms Grace Fu, Minister for Sustainability and the Environment, LowCarbonSG is helmed by the Carbon Pricing Leadership Coalition (CPLC) Singapore, the decarbonisation arm of GCNS, and supported by the National Environment Agency (NEA) and Enterprise Singapore (ESG).

By successfully tracking their carbon footprint using CERT, companies will be issued a LowCarbonSG participant logo to recognise their efforts for developing the habit of being emissions-conscious. Should companies reduce their emissions during the programme, they will also be issued an additional Record of Completion listing their achievement.

How LowCarbonSG Works: Mechanics & Timeline



How LowCarbonSG Works: Mechanics and Timeline

Carbon & Emissions Recording Tool (CERT)

For companies new to carbon reporting, CERT will be especially helpful. It is a robust tool designed to suit companies of varying sizes across sectors. Developed with input from NEA, CERT aims to demystify the process of carbon emissions calculations by distilling international frameworks into an easy to use tool.

To calculate their emissions, companies gather data that is readily available (eg. power bills for electricity use, fuel invoices for fuel consumption etc.) and input the data into the relevant fields within CERT. The in-built formulae automatically calculate the carbon footprint attributable to each emissions source, and summarise the emissions by their respective scopes. The user can then identify the impact

SECTION Ib - DATA INPUT		Baseline Year (Historical)						Total Emissions Over Baseline Period			
Item	Input Unit	Oct '20	Nov '20	Dec '20	Jan '21	Feb '21	Mar '21				
Electricity & Heat/cooling											
Electricity from natural gas	kWh	740	740	800	745	708	700	4,656			
Transportation of Employees											
Air Transport	litre										
Land Transport											
Crack, Truck, passenger cars etc.	km	386	1,015	794	823	1,330	1,127	5,755			
MTW	km	1,520	1,548	1,266	1,231	1,462	1,640	8,657			
Bus	km	1,120	1,391	1,425	1,305	1,300	1,693	8,314			
Transportation with Company-Owned Vehicles											
By Air Transportation											
Crack/Truck	litres										
Gasoline / Jetfuel	litres										
Natural Gas	kg										

SECTION III - Summary and Methodology notes

Summary of Emissions by Scope

Submission Period:

Baseline

	Total Absolute Emissions Over Period		Average Monthly Emissions Over Period		Average Annual Emissions Over Period	
	Quantity	Unit	Quantity	Unit	Quantity	Unit
Scope 1: Direct emissions from sources owned/controlled by company	8,782,460	kgCO ₂ e	1,561,625	kgCO ₂ e/month	18,781,961	kgCO ₂ e/year
Scope 2: Indirect emissions from the generation of purchased energy	1,895	kgCO ₂ e	316	kgCO ₂ e/month	3,769	kgCO ₂ e/year
Scope 3: Indirect emissions (not included in Scope 2) from the sales chain of the company	1,589	kgCO ₂ e	267	kgCO ₂ e/month	3,236	kgCO ₂ e/year
Other Non-BEC Offsets	-60	kgCO ₂ e	-10	kgCO ₂ e/month	-120	kgCO ₂ e/year
Other Carbon Offsets	-60	kgCO ₂ e	-10	kgCO ₂ e/month	-120	kgCO ₂ e/year
Total for Baseline Period Before Offsets	9,933,998	kgCO₂e	1,903,978	kgCO₂e	18,781,961	kgCO₂e
Total for Baseline Period After Offsets	9,933,998	kgCO₂e	1,903,968	kgCO₂e	18,781,884	kgCO₂e

CARBON & EMISSIONS RECODING TOOL (CERT)

Simplifying Carbon Emission Calculation and Tracking



Sample from the Carbon & Emissions Recording Tool (CERT)

of their direct emissions (scope 1), indirect emissions from purchased energy (scope 2) or non-scope 2 indirect emissions (scope 3).

Indices and Comparisons

The tool also gives access to various indices that normalise the company's carbon footprint against various business indicators like productivity, financial performance etc. These normalised values can be used to more accurately assess their carbon efficiency as the business environment evolves over time.

By comparing the carbon emissions across time periods, the company can better assess where the gaps are in their carbon mitigation efforts, and whether their existing efforts are effective. Where emissions indices show increased carbon footprints, a company may decide to invest in technologies or implement programmatic changes to their operations in order to mitigate such increases. Conversely, decreases in carbon footprint are good indicators that existing measures are working well, and should be kept in place or bolstered.

Already, local SMEs such as Vac-Tech Engineering Pte Ltd, a pioneer LowCarbonSG participant, have realised tangible benefits from monitoring their emissions. Their Safety Manager, Mr Retna Vinod, said "LowCarbonSG provided us with tools and guidance to help us decarbonise more effectively. CERT was useful in helping us to track our emissions and identify areas to make our operations more energy- and resource-efficient. As a

Indices & Ratios						
Comparisons of different sizes and operations may have vastly different emissions. These indices and ratios can help you to make sense of your carbon footprint in relation to common business metrics you may use, and allow you to compare your carbon emission performance within and/or across sectors.						
Annual Indices for Baseline Period		Intensity Factors After Offset				
For Unit	Scope 1	Scope 2	Scope 3	Other Non-SCC Offset	Total	Intensity Unit
Production / Productivity	187,850	31.89	32.86	-0.20	187,928.56	kgCO ₂ e/Units Produced
Gross Revenue	5,367.24	1.08	0.91	-0.03	5,989.10	kgCO ₂ e/1000 SGD
Expenses	6,477.08	3.91	1.33	-0.08	6,479.94	kgCO ₂ e/1000 SGD
Net Profit	18,908.30	6.92	5.92	-0.20	18,929.79	kgCO ₂ e/1000 SGD
Total Number of Employees	1,816,488.06					
Gross Floor Area (Sqm)	21,536.72					

Comparisons by Percentage			
	1st Submission vs Baseline	2nd Submission vs Baseline	3rd Submission vs Baseline
Estimated Annual Absolute Emission (kgCO ₂ e/year)	-6.7%	-2.0%	-8.5%
Emission Intensity by Production / Productivity (kgCO ₂ e/Units Produced)	-6.7%	-18.3%	-23.8%
Emission Intensity by Gross Revenue (kgCO ₂ e/1000 SGD)	-18.3%	-2.0%	-20.0%
Emission Intensity by Expenses (kgCO ₂ e/1000 SGD)	-22.7%	-2.0%	-24.2%
Emission Intensity by Net Profit (kgCO ₂ e/1000 SGD)	-10.0%	-2.0%	-16.6%
Emission Intensity by Total Number of Employees (kgCO ₂ e/person/yr)	-28.2%	-2.0%	-29.6%
Emission Intensity by Gross Floor Area (Sqm) (kgCO ₂ e/sqm/yr)	-9.7%	-2.0%	-11.5%



result, we have managed to cut our diesel consumption by 4.6%, electricity usage by 2.2%, and water usage by 7.9%, while reducing operating costs."

As the Singapore government and major corporations pivot towards a lower-carbon supply chain, companies that are able to manage and reduce their emissions will gain a significant competitive advantage. Measuring and monitoring emissions is a good first step to kick-start your company's decarbonisation journey.

Learn more about LowCarbonSG at <https://unglobalcompact.sg/lowcarbonsg>



Developing Low Carbon and Zero Carbon Emissions Technologies

Maritime has specific needs when it comes to reducing carbon emissions and the International Maritime Research and Development Board (IMRB) is one of a range of initiatives with a remit to developing technologies that can help to attain low-carbon or zero-carbon emissions.

WHAT IS IMRB

International Maritime Research and Development Board (IMRB) is a proposed organisation established to commission, co-ordinate and administer programmes for the applied research and development of low-carbon and zero-carbon emissions technologies that are specifically tailored for maritime applications, including the development of working prototypes.

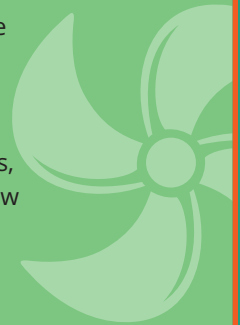
BY WHO

- BIMCO
- CRUISE LINES INTERNATIONAL ASSOCIATION
- INTERCARGO
- INTERFERRY
- INTERNATIONAL CHAMBER OF SHIPPING
- INTERNATIONAL PARCEL TANKERS ASSOCIATION
- INTERTANKO
- WORLD SHIPPING COUNCIL



WHY IT WAS SET UP

Subject to IMO oversight, the sole duty of the IMRB will be to accelerate the research and development of low-carbon and zero-carbon fuels, energy sources, propulsion systems and other new GHG reduction technologies, operating under a charter approved by the IMO.



AIM FOR IMRB TO BE OPERATIONAL BY 2023

Contributions to be made within four months after the end of each calendar year



CONTRIBUTIONS OF 2 USD PER TONNE OF FUEL CONSUMED BY EVERY SHIP

To collect about USD 5 billion over a ten-year period via the establishment of the International Maritime Research Fund (IMRF); Set-up IMRF account for each ship



IMRF

Shall provide the financial support for the administration, management & operation of the IMRB and the monies necessary to fund the specific programmes and projects approved and funded by the IMRB

The IMRB may also accept & utilize financial contributions provided to the IMRB on a voluntary basis by Governments, Institutions & Other Entities.



HOW DOES IT WORK

Amendments to MARPOL Annex VI

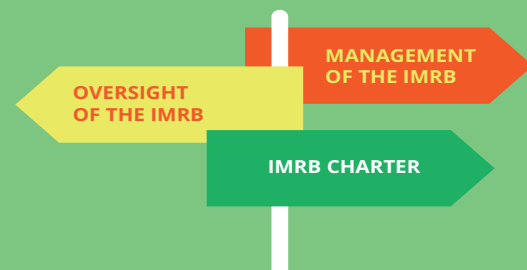
- Certificates and Statements of Compliance related to fuel oil consumption reporting, operational carbon intensity rating and the IMO Maritime Research Fund to be issued or endorsed by administration or authorized organisation
 - Apply to all ships of 5,000 gross tonnage and above
- Shall not apply to:
 - 1 Ships solely engaged in voyages within waters subject to the sovereignty or jurisdiction of the state, the flag of which the ship is entitled to fly; and
 - 2 Ships not propelled by mechanical means, and platforms including FPSOs and FSUs and drilling rigs, regardless of their propulsion.

GOVERNANCE CONCEPT

The IMO Marine Environment Protection Committee should establish arrangements, inter alia, for the approval of the annual budget and expenditure of the IMRB, oversight of the IMRB's management functions and work in accordance with the IMRB Charter, and approval of the appointment of the IMRB's senior officers.

The IMRB should be established, managed and operated without cost to the Organisation, and once the IMO Maritime Research Fund (IMRF) is operational, costs can be recovered from the IMRF.

The IMRB Charter should set out, inter alia, the primary research and development objectives of the IMRB, critical



principles and operating parameters including treatment of intellectual property rights, collaboration with related R & D initiatives, selection procedures for the IMRB Board of Directors, conflict of interest provisions, criteria and procedures for eligibility and review of R & D proposals made to the IMRB including Technology Readiness Levels (TRLs); and other criteria as may be necessary.

IMRB ORGANISATION



RESPONSIBLE FOR MAKING HIGH-LEVEL DECISIONS CONCERNING STRATEGY AND MANAGEMENT OF THE IMRB

- The IMRB Board of Directors shall consist of (11) individuals, including a Chairperson
- Initial Chairperson of the board will be selected by the IMO secretary-General
- The IMRB Nominating Committee shall be composed of (13) members

SSA Council sets roadmap to navigate the future with a vision “To promote, influence and shape the future of Maritime Singapore”

The Singapore Shipping Association (SSA) has always been appreciated as the collective, representative voice of the Singapore shipping industry. The fallout from COVID-19 and its devastating effect on shipping, particularly on the issue of crew change, has only highlighted the strong leadership role taken by SSA. But as digitalisation and decarbonisation regulations impact further on the industry, can this continue?

To set the vision and roadmap ahead for the Association, the SSA Council Members took part in a

workshop on 17th September, facilitated by SSA Executive Director, Michael Phoon.

At SSA's core is the attraction and retention of a quality member base who have a passion to further develop Singapore as a key vibrant maritime hub. It was agreed that SSA's vision “To promote, influence and shape the future of Maritime Singapore” will help ensure the Association continues to be dynamic, vibrant and visible in Maritime Singapore and to stay relevant as a trusted partner and THE VOICE of its members and the industry.

SSA Council 2021/2022



Caroline Yang
SSA President



René Piil Pedersen
SSA Vice President & Honorary
Secretary, General Affairs
Committee Chairman



Katie Men
Vice President and
Honorary Treasurer



Colin de Souza
Chair of the International
Committee



Nitin Mathur
Chair of the Services
Committee



Lee Keng Lin
Chair of the SSA Offshore
and Renewable Energy
Committee



Gina Lee-Wan
Chair of the Legal &
Insurance Committee



Ng Ee Ping
Vice-Chair of the
International Committee



Teo Teng Seng
Chair of the Digital
Transformation Committee



Akanksha Batura Pai
Chair of the Young
Executives Group (YEG)



Apostolos Boutos
Chair of the Marine
Fuels Committee



Gerbrand Vroegop
Chair of the Shipping Finance
Services Committee

SSA will continue to foster deep engagements with members, develop wider and stronger networks with stakeholders nationally, regionally and internationally, and jointly shape practical policies for better sustainable shipping. The Council team agreed to focus on four key areas: digitalisation; decarbonisation; talent and a thriving IMC.

Digitalisation

COVID-19 has certainly accelerated the speed of digital adoption. Recent developments include the IMO cybersecurity regulation, changes to the Electronics Transaction Act (ETA) by the Singapore authorities and MPA's digitalPORT@SGTM which streamlines vessel, immigration and port health clearances across multiple agencies into a single application.

The MPA is also working towards digitalOCEANSTM, an interoperable platform and information hub that facilitates cross-border data exchange and automated services across supply chain players, clearance authorities and other national single windows. As shipping operations become more interconnected digitally, the SSA focus is to:

- i. Shape sustainable digitalisation through standardisation and cyber protection*
- ii. Promote the adoption of digital technologies to help transform economies and enhance productivity and connectivity*
- iii. Influence relevant stakeholders to support national digitalisation initiatives with partners and ecosystems*

Initial trials of the single maritime window included SSA members and this early familiarisation of the system enabled them to be ahead of the game when dealing with the increasingly digitalised shipping environment. At the same time their inputs were helpful to the port authority which incorporated their suggestions into the improved system.

While some organisations have embraced digitalisation well, many others, such as the small-medium enterprises

(SMEs), are still grappling with the swift changes. These companies may also miss out on the opportunities presented by being connected to new eco-systems, physically or digitally.

The formation of the SSA Digital Transformation Committee (DTC) and the establishment of the new Startup membership tier aims to help increase members' awareness of emerging technologies/solutions and facilitate collaborations. The newly introduced Digital Vision and Sustainability Programme (DSVP) is another initiative to help member companies develop their digital blueprint.

To build a sustainable talent pipeline for critical and emerging manpower, both sea and shore side, the Association will grow its networks so that together we can develop policies to attract maritime talent.

Decarbonisation

Climate change, with increasingly severe weather disasters, is regarded as one of the greatest threats to humanity. SSA recognises that rapid decarbonisation of the shipping sector will be vital if the world economy is to achieve the Paris Agreement's climate change goals. SSA is committed to decarbonisation and will look to:

- i. Help shape decarbonisation policies on standards and operations*
- ii. Influence stakeholders to support national decarbonisation initiatives*
- iii. Promote decarbonisation technologies*

SSA believes that the International Maritime Research Development Board (IMRB) and the proposed creation of \$5billion International Maritime Research Fund (IMRF) will address the key issue of reducing actual carbon emissions by supporting the necessary research and development.

SSA is open to discussions of Market-Based Measures (MBM), as long as they are considered in conjunction with the IMRB and comply with the International Maritime Organization (IMO) principle of a level playing field. The Association is also committed to help its members support Singapore's National Determined Contribution (NDC) and meet international decarbonisation targets.

At a recent SSA low carbon management workshop, conducted jointly with the MPA and Global Compact Network Singapore (GCNS), GCNS shared the need for decarbonisation and how companies can work towards zero carbon emissions. Participants were also given a demonstration of GCNS' carbon management tool which measures and manages carbon emissions.

Talent

Despite contributing 7% of Singapore's GDP and employing more than 160,000 people, the maritime sector appears to be less attractive and sexy than aviation, for example, to young people. The SSA will identify and work with relevant stakeholders to:

- i. Promote Maritime Singapore to attract and retain talent*
- ii. Groom young leaders and support a sustainable talent pipeline*
- iii. Shape Maritime Singapore to make it attractive*

SSA will continue to collaborate with MPA, the Singapore Maritime Foundation (SMF) and other organisations to build awareness of the many opportunities in Maritime Singapore. The SSA Young Executive Group (YEG) is part of the Association's efforts to nurture young maritime professionals and next generation leaders, promoting the activities available within the Association, developments in the wider shipping community and collaboration with other organisations to create more awareness of Maritime Singapore.

To build a sustainable talent pipeline for critical and emerging manpower, both sea and shore side, the Association will grow its networks so that together we can develop policies to attract maritime talent.

To make Singapore attractive as a leading IMC and be recognised as a maritime knowledge hub, SSA will be exploring collaborative initiatives to boost the technology/innovation eco-system, augment the maritime legal and arbitration offerings and R&D in decarbonisation etc.

Thriving IMC

The success of the Singapore IMC cluster is in part due to its pro-business policies. However, anecdotal evidence suggests that the stricter stipulations on foreign talents and a seeming reluctance for seafarers to be seen as key maritime frontline workers and not just as travellers crossing borders, has made a dent on how easy it is to run maritime operations in Singapore.

SSA will seek to:

- i. Promote ease of doing maritime business in Singapore*
- ii. Position SSA as a world leading Association*
- iii. Influence relevant stakeholders to support new challenges in shipping through expanding SSA credentials*
- iv. Shape a thriving IMC with customised policies to remain competitive and vibrant*

SSA will be bold in clearly stating our position on matters where others may have opposing views. This may involve sharing unpalatable inputs and perspectives with relevant stakeholders. However, we will be committed to work towards resolving arising challenges and issues in the maritime sector, locally and internationally, for the betterment of shipping.

With steadfast steps, SSA will be able to promote, influence and shape the future of Maritime Singapore, not only as a national trade association but a world leading shipping association.

Visionary Shipping At 3rd SSA Tech and Demo Day

SSA successfully held the 3rd edition of Tech & Demo Day at Amara Hotel on the 10 September 2021. SSA was thankful for positive responses and high attendance albeit the stringent safe management measures as part of the MICE (Meetings, Incentives, Conferences, and Events) requirements stipulated by the Singapore Tourist Board's (STB).

Themed 'Visionary Shipping', SSA hoped the various sessions held that day helped inspire members embrace digitalization and the connected maritime eco-system for business resilience.

The SSA-led Digital Vision & Sustainability Programme (DVSP), comprising four initiatives :- Tech Talk Thursdays, Tech & Demo Day, Digital Technology Adoption Consultancy, and Sustainability Workshops for the SMEs (Small & Medium Enterprises) in the maritime industry, was officially launched at the event.

SSA developed this programme to help the SMEs in the maritime and shipping industry develop and execute bespoke digitalisation blueprints while setting up the cornerstones for them to build business resilience and sustainability in this everchanging global business environment driven by technology. Catalysing on the current trends to drive digitalisation and sustainability in the maritime and shipping industry, SSA is proud to have been able to launch this programme to its members. Credits to the designated DVSP Champions from member companies who have come on board this route to digitalisation and sustainability with SSA.

The event started with a series of presentations by representatives from Enterprise Singapore (ESG), Port of Singapore Authority (PSA), Singtel, Maritime and Port Authority of Singapore (MPA), Infocomm Media Development Authority (IMDA), and SSA's Digital & Transformation Committee (DTC). Every speaker shared their different perspectives on the importance of



digitalisation, and much attention was given to promote organisation-wide transformational efforts for the growth of SMEs, particularly those in the maritime and shipping industry.

Following the presentations, there was a panel discussion moderated by Mr Lakhbir Singh from Orient Maritime Agencies Pte Ltd. Representatives from SSA, MPA, and IMDA, came together to discuss working in the "New Normal" after the COVID-19 pandemic with regards to companies' digital capabilities and how the industry can help SMEs to digitalise. The session ended off with a final presentation from Eastern Pacific Shipping Pte Ltd.

Throughout the event, there were various demonstration booths set up and breakout sessions in different rooms organised to allow attendees to interact with technology providers. During these sessions, the representatives and speakers showcased their services designed to meet the needs of both SMEs and global shipping players. Workshops by MPA, PIER71, as well as MPA & WSG, were organised to ensure the SMEs became aware of the various supports available for them, in the course of their transformation journey.

SSA would like to thank all speakers and the event sponsor, Enterprise Singapore, for making the 3rd SSA Tech & Demo Day a success!

MPA launches notation for Singapore Registry of Ships

The Maritime and Port Authority of Singapore has rolled out the Singapore Registry of Ships (SRS) Notation initiative to recognise ship owners and operators who voluntarily incorporate solutions to drive digital transformation, strengthen cyber security, enhance the well-being of seafarers and pursue sustainable shipping.

The SRS will be the first registry in the world to introduce different categories of notation for its ship owners - 'smart', 'cyber', 'welfare' and 'green'. A certificate of recognition will be issued to Singapore-flagged vessels that fulfil the requirements for each of the categories and their details will be published on the MPA website.

The SRS Notation initiative was announced by Senior Minister of State for Transport, Chee Hong Tat, at the 2021 SRS Forum, a hybrid event involving more than 350 participants. In more detail, the notation categories are:

- a. **"Smart" notation** – awarded to vessels that adopt digital solutions to improve the safety and efficiency of shipboard operations, such as automation, advanced monitoring, and remote inspection.
- b. **"Cyber" notation** – awarded to vessels that have adopted advanced cyber security measures to protect their key shipboard operational technology systems from cyber attacks. The four key systems are communication systems, propulsion, machinery and power control systems, navigation systems and cargo management systems.
- c. **"Welfare" notation** – awarded to vessels equipped with good infrastructure and welfare amenities to enhance the quality of life for their crew.
- d. **"Green" notation** – awarded to vessels that have implemented solutions to reduce their carbon emissions, such as usage of low- or zero-carbon fuels.

Qualifying vessels will receive additional benefits which will be introduced from 2022, such as a reduction in initial registration fees and rebates on annual tonnage taxes during the qualifying duration.

Having delivered the opening address at the Forum, themed 'Your Partner in Quality and Sustainable Shipping', Mr Chee presented the SRS Top Net Tonnage Contributor Award to Wan Hai Lines Ltd. Meanwhile a total of 15 companies received Green Ship certificates under the Green Ship Programme in recognition of their efforts to reduce the environmental impact of their fleet.

Below are a list of companies and individuals recognised at Singapore Ship Registry of Ships (SRS) Forum 2021

1. SRS Top Net Tonnage Contributor Award

- Wan Hai Lines Ltd

2. Green Ship Certificate

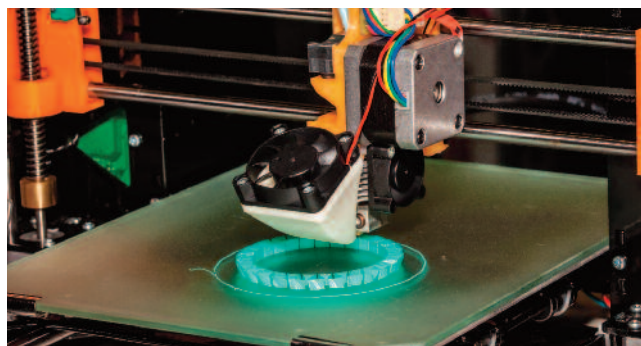
- A.P. Moller
- BW Group
- CLdN Cobelfret
- Financial Products Group
- FueLNG Pte Ltd
- Goodwill Maritime Pte Ltd
- IMC Shipping Co
- IS Container Pte Ltd
- Meratus International
- Nova Shipping & Logistics
- Pacific Carriers Limited
- V-Bunkers Tankers Pte Ltd
- Wan Hai Lines Ltd
- Wideshine Enterprises
- XT Shipping

Additive Manufacturing Shows Enormous Potential For Maritime

The Additive Manufacturing (AM) market has been growing at a fast rate of around 20% (CAGR) annually since 2014. AM applications have enabled manufacturers to explore various design considerations through multiple iterations of rapid prototyping in the development and manufacturing phases. In the marine industry, use of AM has moved well beyond rapid prototyping applications into serial production processes, due to the advantages of greater printing flexibility, shorter production time and other cost savings. In fact, AM potential has already been recognized by various stakeholders in Singapore such as government, ship owners, shipyards, and classification societies, etc. For example, ABS, Sembcorp Marin, Polar Tankers, and 3D Metalforge have successfully fabricated, tested, and installed functional additive manufactured parts on board the oil tanker Endeavor.

Despite AM's strong industrial applications, the implementation of AM remains constrained by its maturity in terms of printing quality and consistency. The parts produced may be subjected to many uncertainties during the printing process such as cracking, porosity and suboptimal microstructures.

The AM processes and resulting parts must be Validated and Verified (V&V) through a process that is rigorous, proportional to the risk of part failures, and based on sound measurement science technology. Currently, most V&V activities rely on raw material qualification, physical testing (destructive and non-destructive) of produced parts, and some in-process condition measurements. These activities can be resource-intensive and time consuming, especially when third-party V&V approvals are involved. Additionally, because AM applications are often used for rapid production needs (often in small batches and prototype development), V&V activities can be prohibitively expensive in relation to the actual production costs.



For AM applications to achieve their full potential, V&V activities not only must be effective, but also as dynamic as the AM technology use cases. Model-based approaches, including the use of modeling and simulation tools (for example the AM digital twin developed by IHPC) and in-situ/in-process measurements, can provide the tools needed to allow V&V activities to keep pace with the delivery demands of AM use cases. While final part quality testing will always be an important part of any V&V process for critical parts, model-based approaches can be used in the V&V process to complement physical testing and potentially reduce the physical testing requirements.

However, if model-based approaches are to be used in the V&V process, the evaluation of their performance and the way they are used need to be standardised. ABS, as a classification society, is developing methods and guidelines for evaluating the performance of these approaches and incorporating them into the V&V process when appropriate.

As AM is still at a nascent stage, we expect that more companies will begin to adopt such technology in the near future, and that AM could become an essential part of the production process for on-demand printing. In support of this, ABS will continue to play an active role in AM certification and qualification.

Bringing Military & Industry Leaders Together to Counteract Maritime Security Threats and Strengthen Regional Collaboration



Top row (left to right): Mr Michael Phoon (Executive Director, SSA), LTC Lester Yong (Head IFC), LCDR Sam Yee (Officer-in-charge, UKMTO).

Bottom row (left to right): CDR Eric Jaslin (Commander, Mica Center), Mr Steven Kwan (Assistant Vice President, Dy Advanced Systems, Ewam Bu, ST Engineering), Dr Phillip Belcher (Marine Director, Intertanko)

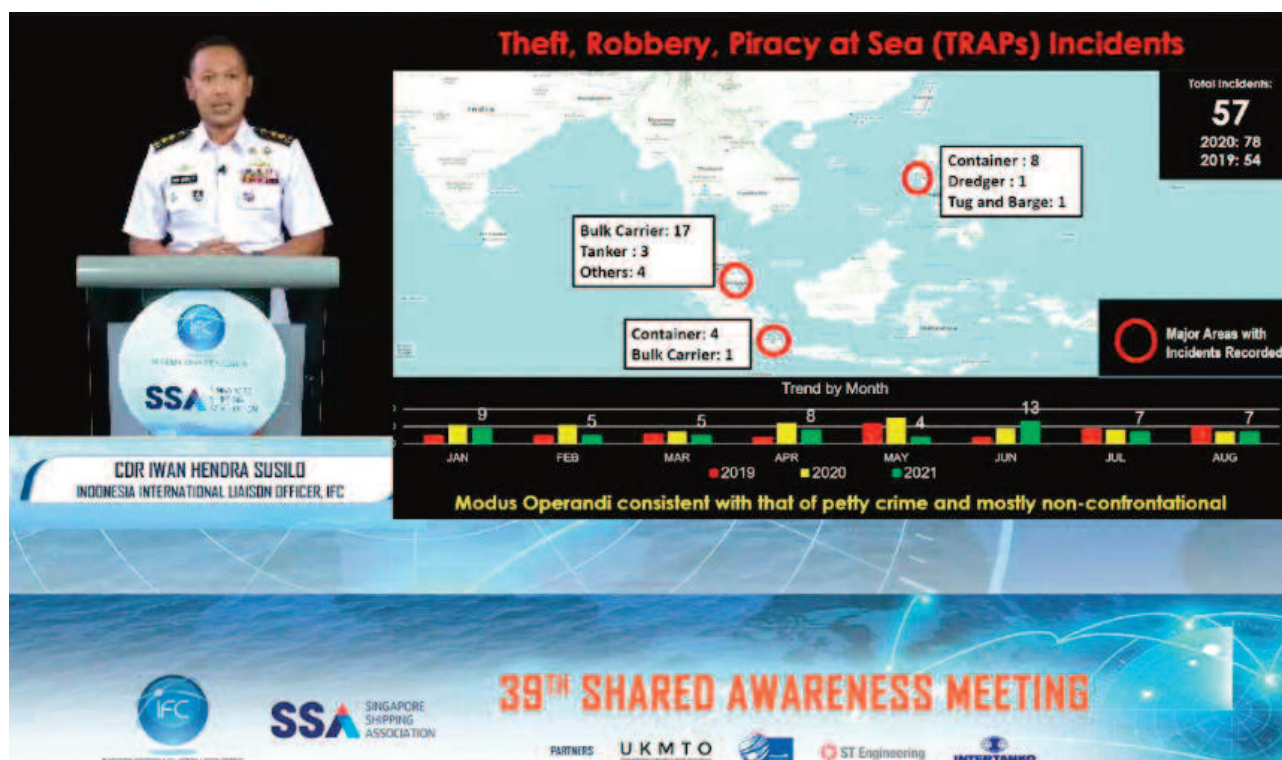
The Information Fusion Centre (IFC) and the Singapore Shipping Association (SSA) co-organised the 39th Shared Awareness Meeting (SAM) on 14 Oct 2021. This was the second time the IFC and SSA co-hosted the event, which saw strong participation of more than 240 participants from 30 countries, comprising key stakeholders from the shipping industry and maritime security (MARSEC) agencies.

In his opening address, Head of IFC Lieutenant-Colonel (LTC) Lester Yong, highlighted how collaboration with key stakeholders has enabled IFC to strengthen shared information to facilitate operational responses for maritime security.

"The SSA is a key partner as it is the leading voice driving cooperation and important initiatives for the betterment of the shipping industry, particularly in our region," said LTC Yong.

Speaking at the same event, SSA President Ms Caroline Yang, said, "The international maritime community recognises the need to take a collaborative approach to ensure ships can transit in key water ways and open seas, safely and securely."

As part of the IFC's AOI brief, the Indonesia International Liaison Officer (ILO) at the IFC, CDR Iwan Hendra Susilo,



on behalf of IFC, shared the IFC's observations and assessments on the Theft, Robbery, and Piracy at Sea (TRAPS) incidents in 2021, which primarily took place in three hotspots: the eastbound lane of the Singapore Strait, Manila Anchorage, and Jakarta Anchorage. CDR Iwan shared that the modus operandi of the perpetrators involved remained consistent with petty crime, and while some perpetrators were reportedly armed, the majority were non-confrontational, opting to flee upon being sighted. He also noted that average monthly incidents in the last quarter had halved to 7 from a high of 13 in June this year.

Responding to queries from the participants, LTC Yong shared examples of how regional authorities had been actively collaborating and sharing information, particularly through the respective ILOs at the IFC, for more effective enforcement and deterrence measures. Shippers were also encouraged to contribute to overall efforts by maintaining vigilance and adopting shipboard protection measures when in or transiting identified hotspots, and by immediate reporting of

incidents/suspicious activities to local authorities and the IFC so as to facilitate prompt responses.

In addition, there were no incidents of sea robberies within Singapore's waters since 2020 despite the huge volume of shipping that passed through – an acknowledgement of the combined and continued efforts of Singapore's maritime agencies, IFC, and the shipping industry.

The IFC is a 24/7 regional MARSEC Information Sharing Centre with linkages to more than 100 partners worldwide. Supported by a team of more than 20 ILOs from partner navies and coastguards, the IFC's key role is to facilitate sharing of accurate and reliable white-shipment information to cue timely responses and enhance MARSEC efforts. As part of its shipping engagement efforts, the IFC regularly organises the SAM to update key partners on the MARSEC situation, and share best practices and industry insights to strengthen mutual understanding and cooperation amongst all stakeholders, for safe and secure seas.

Maritime Shares Common Goals But Not A Unified Voice

SSA President Caroline Yang took part in one of the opening events at London International Shipping Week. Under discussion at the International Shipowning & Shipmanagement Summit (ISSS) were the challenges faced by shipping as a result of the COVID-19 pandemic including the issues of crew repatriation and the constantly changing COVID-19 rules that have to be navigated.



Speakers included Mark O'Neil, President of both Intermanager and Columbia Shipmanagement, Guy Platten, Secretary General of the International Chamber of Shipping, Olav Nortun, Chief Executive of Thome Group, Phil Belcher, Intertanko Marine Director, Bjoern Sprotte, Chief Executive of V.Group, Bjørn Højgaard, Chief Executive of Anglo-Eastern Univan Group, and Singapore Shipping Association President Caroline Yang.

Despite differing viewpoints, there was general agreement with Ms Yang's assertion that, while many countries pay lip service to the need to treat seafarers as frontline workers, the reality on the ground is quite different. She said that countries must start to align their actions with words.

Although different regions have different approaches to challenges, Ms Yang felt that there is reason to be optimistic. Cooperation between national and international associations, as well as the IMO, have resulted in a cohesive approach from the maritime sector with regards to technology and decarbonisation.

For Ms Yang the vital topics today remain crew change and vaccination of seafarers, and finding a way to work with governments globally, taking into account their different cultures, is the priority if we are to achieve these goals.

Although different regions have different approaches to challenges, Ms Yang felt that there is reason to be optimistic.

A wide-angle photograph of the Singapore skyline across the water. The Marina Bay Sands hotel, with its iconic three towers and a large, white, lotus-shaped structure at the base, is prominent on the left. The background is filled with numerous other skyscrapers of varying heights and colors, mostly in shades of blue and grey. The water in the foreground is calm, reflecting the buildings and the sky. The sky is a clear, pale blue.

MPA, SSA and GCNS sign MoU to Raise Carbon Accounting Capabilities among Maritime Companies in Singapore

The Maritime and Port Authority of Singapore (MPA), Singapore Shipping Association (SSA) and the Global Compact Network Singapore (GCNS) signed a Memorandum of Understanding (MoU) on 24th September 2021, to support the development of capabilities in carbon accounting amongst maritime companies in Singapore.

The MoU identified three focus areas in the tripartite collaboration. Firstly, conducting training courses on carbon reporting, monitoring and management for local maritime companies affiliated with SSA. Secondly, supporting local maritime companies in their journey to track and monitor their carbon emissions, and to recognize companies in their emissions reduction. Lastly, developing a guide on maritime sector carbon reporting.

Ms Quah Ley Hoon, Chief Executive of MPA said, "A collective effort is key to helping the local maritime industry achieve their decarbonisation goals. MPA is pleased to partner with GCNS to tap on its expertise on

corporate sustainability, as well as to tap on the industry know-how and network of SSA in this critical endeavor to help maritime companies transit to a more sustainable future."

Mr Michael Phoon, Executive Director of SSA said, "As a key maritime stakeholder, SSA can contribute to the IMO2050 decarbonisation goals by steering our members and the shipping community to undertake carbon accounting and embrace efforts towards reducing the carbon footprint. We hope this collaboration with MPA and GCNS will enable the shipping industry to do our part towards decarbonisation."

Ms Esther Chang, Executive Director of GCNS added, "Decarbonisation has become a global imperative for countries and businesses alike. As a key engine of Singapore's economy, the maritime industry has great potential to steer actions and progress on decarbonisation. GCNS is delighted to partner with MPA and SSA to help companies chart their paths towards a low-carbon future."

INTERNATIONAL SAFETY@SEA WEEK 2021

Watch all five session recordings at www.safetyatseaweeek.gov.sg



Capt. Yves Vandeborn, Honorary President, The Nautical Institute (Singapore), Mr Steen Lund, Chief Executive Officer of RightShip at the Opening Session.

The International Safety@Sea Week from 30 August to 1 September 2021 attracted over 1,000 attendees with industry leader speakers from Singapore, Hong Kong, UK and Norway.

This was the 8th edition organised by the Maritime and Port Authority of Singapore (MPA), and it included the biennial International Chemical and Oil Pollution Conference (ICOPCE).

Attendees from more than 70 countries participated in five sessions and discussed topics related to maritime safety such as safety in cargo transportation, future of crew training, marine environmental protection as well as incident management.

In his opening address, Mr Chee Hong Tat, Senior Minister of State for Transport, announced the start of the Sea Crew Vaccination Initiative or SEAVAX to facilitate vaccination access for eligible non-resident foreign

seafarers who are either working in the Port of Singapore for a prolonged duration, engaged in the supply of essential goods, or engaged in ferrying passengers.

Mr Steen Lund, Chief Executive Officer of RightShip, delivered the keynote address on the theme - "The Human and Technology Crossroads for Maritime Safety", where he highlighted safe crew change and crew welfare as industry priorities where technology could play a role in mitigating risk and improving current standards.

ICOPCE's keynote speaker, Mr Carsten Brix Ostenfeldt, INTERTANKO Council Member and Chief Operations Officer, Anglo-Eastern Ship Management Ltd, spoke on "A Holistic View on the New Era in Marine Environment Protection"; he shared that industry players should continue investing and implementing environmentally efficient technologies on their vessels as shipping transitions to a zero-pollution future.



Both keynote speakers were joined by Dr Øyvind Hellan, Vice President (Research) of SINTEF Ocean and Mr Nick Chubb, Managing Director at Thetius, in an engaging panel discussion moderated by Capt Yves Vandenberg, Honorary President, The Nautical Institute (Singapore).

On the second and third day, experts and industry leaders based in Singapore and overseas shared their insights and views at two MPA flagship conferences.

Plenary 1 of the International Safety@Sea Conference discussed wide-ranging issues on safer carriage of goods onboard container ships, and their views on what more could be done. The second plenary examined the need to rethink the approach to crew training in a VUCA (Volatility, Uncertainty, Complexity and Ambiguity) world, as well as better cater to the millennial workforce.

ICOPCE's first plenary focused on marine environmental protection in a changing landscape, with discussion on major maritime incidents and how the adoption of new fuels might impact marine accidents, salvage and pollution. Panellists for Plenary 2 shared about how different companies responded to incidents at sea, the salvage procedure and issues, and navigating the increased complexity of incident management.

This year's International Safety@Sea Awards winners were awarded for their outstanding contributions in search and rescue efforts, and innovation in technology, systems and training. The awards are presented by MPA each year to recognise outstanding efforts of organisations and individuals who have contributed towards ensuring safer seas.

Award Winners This Year

Outstanding Contributions in Search and Rescue Efforts in 2020

1. Anglo-Eastern Shipmanagement (Singapore) Pte. Ltd.
2. ASP Ships Group (Manager) / Rio Tinto (Owner)
3. CMA CGM International Shipping Company Pte. Ltd.
4. Executive Ship Management Pte. Ltd.
5. Tai Chong Cheang Steamship Co., (Shanghai) Ltd.
6. TATA NYK Shipping Pte. Ltd. (Owner) / Fleet Ship Management Pte. Ltd. (Technical Manager)
7. Thome Group
8. Union Marine Management Services Pte. Ltd

Open Category

1. Singtel Satellite
2. Teekay Marine (Singapore) Pte. Ltd.

STARTUP MEMBERS



ScanReach

ScanReach is a maritime technology company headquartered in Norway and we have recently opened a Singapore office. ScanReach has developed the world's first wireless IoT platform for complex and confined steel environments in the maritime market. Our solutions enable a number of onboard smart sensors as well as improved POB safety for vessels and offshore installations worldwide.

ORDINARY MEMBERS



Minerva Bunkering Pte Ltd

Minerva Bunkering Pte Ltd is an international marine fuel logistics company that provides fuel and service solutions to ships in port and at sea. The company operates the industry's largest physical supply network and serves over 700 active customers across all major commercial shipping sectors. Minerva Bunkering is a 100-percent-owned subsidiary of Mercuria Energy Group, one of the largest privately-held energy and commodities companies in the world.



Tian San Shipping

Tian San Shipping provides transportation and marine services to keep the port of Singapore running smoothly. We own and operate a fleet of about 50 harbour vessels consisting of ferries, launches, RoRos, workboats and garbage collection craft which ply the port waters daily, serving the needs of all port users.



Vallianz Offshore Marine ("VOM")

Being part of Vallianz Holdings Ltd, Vallianz Offshore Marine ("VOM") is an established provider of Offshore Support Vessels (OSVs) and integrated offshore marine solutions servicing the renewable and oil and gas industry.

Headquartered in Singapore, the Group and its associated companies in the Middle East and Indonesia own and operate a fleet of 74 OSVs, covering markets in the Middle East, APAC and Gulf of Mexico.



Yinson Green Technologies Pte Ltd

Yinson Green Technologies Pte Ltd aims to build a global business which accelerates the transition to a net zero world. Current projects include Hydroglyder, a fully electric passenger craft equipped with advanced hydrofoil technology; and a fully electric harbour craft solution with swappable batteries for the Port of Singapore as part of the Goal Zero consortium, funded by MPA and SMI.

Executive Development Programme

Training Calendar | NOV 2021 - JAN 2022

Course Title	Start Date	End Date	Duration	FEES* (SGD)	
				SSA Members	Non-SSA Members
Introduction to Shipping (Masterclass)	16/11	17/11	2 Days	\$642 \$342*	\$963 \$513*

2022

Alternative Gas Fuel - Design & Safety Management for Vessels & Terminals	20/01	21/01	2 Days	\$963 \$513*	\$1605 \$855*
SS600 & Basic SS648 in the Bunker Industry	23/02	24/02	2 Days	\$856 \$296*	\$1284 \$444*
Vessel Technical & Operations – IMO 2020 & Beyond	24/02	25/02	2 Days	\$963 \$513*	\$1605 \$855*

***Fees subject to prevailing GST. MCF Training Grant is available for eligible participants. Please refer to www.mpa.gov.sg/mcf for more information. Dates may be subject to change.*

For course enquiries, please contact Kuna at 6305 2267 or email kuna@ssa.org.sg



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James Tham, Managing Director
Penguin International Ltd.



Image Courtesy Penguin Intl. Ltd.

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