

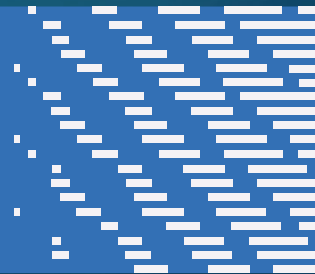


MPA
SINGAPORE

Towards a Sustainable and Resilient Maritime Future

Annual Report

2023



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ABOUT MPA

MPA was established on 2 February 1996 with the mission to develop Singapore as a premier global hub port and international maritime centre, and to advance and safeguard Singapore's strategic maritime interests.

MPA is the driving force behind Singapore's port and maritime development, taking on the roles of port authority, maritime and port regulator and planner, international maritime centre champion, national maritime representative and a champion of digitalisation and decarbonisation efforts at regional and international fora such as at the International Maritime Organization.

MPA partners industry, research community and other agencies to enhance safety, security and environmental protection in our waters, facilitate maritime and port operations and growth, expand the cluster of maritime ancillary services, and develops maritime digitalisation and decarbonisation policies and plans, R&D and manpower development. MPA is responsible for the overall development and growth of the maritime domain and Port of Singapore.

In 2023, Singapore's annual vessel arrival tonnage crossed 3 billion Gross Tonnage and it remains the world's busiest transshipment hub with a total container throughput of 39 million 20-foot equivalent units (TEUs).



CHAIRMAN'S MESSAGE

Maritime Singapore has navigated through a year marked by significant achievements amidst a backdrop of global challenges.

As a bunkering and transshipment hub connecting Asia with the Americas, Middle East, Europe and Africa, Singapore is a critical node along the global supply chain and has remained steadfast in supporting international trade and providing key maritime services, including finance, insurance, arbitration and shipbroking. The Port of Singapore was well-recognised both locally and internationally, such as the top international maritime city in the Xinhua-Baltic International Shipping Centre Development Index for the 10th consecutive year.

Our re-election to the International Maritime Organization (IMO) for a 16th consecutive term underscores Singapore's pivotal role in shaping the future of global maritime standards and practices. Singapore is also Vice-Chair of the IMO Marine Environmental Protection Committee (MEPC), and plays a leading role in facilitating international consensus towards the adoption of the IMO Strategic Plan and the 2023 IMO Revised Strategy on Reduction of Greenhouse Gas (GHG) Emissions from Ships, as well as contributing to capacity-building programmes for an inclusive and sustainable maritime future.

Closer to home, the Port of Singapore witnessed a remarkable year, with vessel arrival tonnage crossing the three billion Gross Tonnage (GT) mark for the first time, reaching a record of 3.09 billion GT. Our container throughput grew by 4.6%, reaching a new high of 39.01 million twenty-foot equivalent units (TEUs), and a total of more than 590 million tonnes of cargo was handled.

Development of Tuas Port is progressing steadily. Reclamation works for Phase 1 have been completed, construction for Phase 2 has crossed the 60% mark, and preparatory works for Phase 3 have also commenced. In 2023, three more berths under Phase 1 were opened, increasing the total operational berths in Tuas Port to eight. Three more berths will be opened by the end of 2024.

Singapore continues to grow as an International Maritime Centre with total business spending exceeding S\$4.8 billion in 2023, with over 25 maritime companies establishing or expanding their operations here. These companies include the shipping arms of international trading firms, such as COFCO International Freight, and shipping operators, such as Asyad Shipping. Existing companies in Singapore, such as A.P. Moller-Maersk and Itochu, are also expanding their operations. A.P. Moller-Maersk is enhancing its omni-channel fulfilment capabilities with a new 1.1 million sq. ft. facility in Jurong West,

“With a sturdy ship crewed by a very strong team, I am confident that together with our industry and union partners, we are well-equipped to ride out the storms and seize the opportunities that come along, as we lead Maritime Singapore to greater heights.”

- Mr. Niam Chiang Meng



CHAIRMAN'S MESSAGE

while Itochu has established a green desk in Singapore to support the green fuel bunkering and transportation value chain.

As the world's largest bunkering hub, bunker sales in Singapore reached a record 51.8 million tonnes, surpassing the previous high, with alternative fuels accounting for 1.2% of this – highlighting the growing demand for greener fuels that we must be prepared to meet. We witnessed a significant milestone in our development towards a multi-fuel future, with the world's first ship-to-containership methanol bunkering operations on board the *Laura Maersk*, conducted in July 2023 in the Port of Singapore. The operation was supported by MPA, working together with Maersk and various government and research partners, to ensure that the crew training, safety preparations and incident management responses, were all in place for the efficient and safe operations. We have learnt a lot from the process and are working towards the development of the Methanol Bunkering Technical Reference in 2024. In March 2024, we worked with our partners and successfully supported the trial in the Port of Singapore on the world's first use of ammonia, in combination with diesel in the combustion process, as a marine fuel onboard the Singapore-flagged ammonia-powered vessel, the *Fortescue Green Pioneer*.

In the global arena, the collective efforts to address maritime challenges have never been more critical. Singapore and many partners worked together to support the 80th session of the IMO Marine Environment Protection Committee (MEPC80), which saw the successful adoption of the 2023 IMO Revised Strategy on Reduction of GHG Emissions from Ships, setting out enhanced targets for international shipping, including the common target to reach net-zero GHG emissions by international shipping by or around, i.e. close to, 2050.

Singapore has actively participated in this transformation journey and established several Green and Digital Shipping Corridors (GDSCs) with global partners to trial new technologies and fuels, and to support the scale-up of green and smart solutions to improve the efficiency and sustainability of shipping routes. At home, we are also putting in place the building blocks for an electric harbour craft (eHC) ecosystem. We have recently launched the first eHC charging point pilot at the Marina South Pier in April 2024. Insights from the pilot will inform the development of our national eHC charging infrastructure masterplan, implementation plan, as well as the national standards for eHC charging.

As we set our course for 2024 and beyond, we foresee some rough seas ahead with ongoing geopolitical tensions and global economic growth expected to slow down. Nevertheless, smooth seas do not make skilled sailors, and it is through such challenges that we grow and become more resilient. With a sturdy ship crewed by a very strong team, I am confident that together with our industry and union partners, we are well-equipped to ride out the storms and seize the opportunities that come along, as we lead Maritime Singapore to greater heights.

Mr. Niam Chiang Meng
Chairman
Maritime and Port Authority
of Singapore

CHIEF EXECUTIVE'S MESSAGE

Despite threats to global supply chains, MPA and Maritime Singapore reached several milestones in 2023. We achieved a record-breaking annual vessel arrival tonnage of 3.09 billion gross tonnage (GT) and saw a new high of 39.01 million twenty-foot equivalent units (TEUs) in container throughput. Maritime businesses contributed a record \$4.8 billion in total spending, and more than 25 maritime companies established or expanded their operations under MPA-related programmes. The number of start-ups under the PIER71™ programme also grew to almost 120, from just 17 in 2018.

These achievements are not ours alone but testament of the strong support and collaboration with our international partners, industry, research and enterprise community, and unions.

We will continue exploring ways to support the growth of businesses while helping them to reduce costs and remain competitive. In January 2024, we announced that MPA will waive the need for security deposits and banker's guarantees for billing parties assessed to be of lower credit risk from 1 April 2024. More than 80 per cent of the over 1,000 MPA's existing billing parties are expected to have their security amount worth more than \$20 million/year waived, which will improve the liquidity of maritime businesses and help them better manage rising business costs.

Charting a Greener Course with Decarbonisation

The successful adoption of the 2023 IMO Strategy on Reduction of Greenhouse Gas (GHG) Emissions from Ships in July 2023 has lent renewed urgency to accelerate global maritime decarbonisation efforts. Following Singapore's first Green and Digital Shipping Corridor (GDSC) with the Port of Rotterdam established in 2022, we have since initiated more GDSCs with Australia, Japan, Los Angeles / Long Beach, and Tianjin, expanding the partnership network to develop and trial new technologies and fuels, as well as support the scale-up of green and digital solutions.

As the world's largest bunkering hub, Singapore is enhancing our capabilities to meet the evolving fuel needs of international shipping. We facilitated the world's first ship-to-containership methanol bunkering operation in July 2023, and are due to develop the Technical Reference for Methanol Bunkering in 2024. For ammonia, we have concluded an Expression of Interest (EOI) to provide a low- or zero-carbon ammonia solution for power generation and bunkering on Jurong Island. MPA and the Energy Market Authority (EMA) are currently reviewing the proposals submitted by six shortlisted consortiums in a closed Request for Proposal (RFP), with a 2nd stage RFP planned around Q3 2024 for the selected consortiums to work

“We are mindful of the various challenges that will continue to impact global supply chains going ahead. However, these also present opportunities that can help focus international efforts and bring to bear the collective resources to develop solutions to address these challenges.”

- Mr. Teo Eng Dih



CHIEF EXECUTIVE'S MESSAGE

with MPA and EMA on the pre-Front End Engineering Design (pre-FEED) study of their proposals. More recently, in February-March 2024, we conducted the successful trial of the world's first use of ammonia in combination with diesel as a marine fuel onboard a dual-fuelled Singapore-registered ammonia-powered vessel, the *Fortescue Green Pioneer*, in the Port of Singapore.

On electrification, we are working closely with the industry and research agencies on ways to help reduce the cost of adopting electric harbour craft (eHC) and to build the eHC charging infrastructure to support the wide scale adoption of eHC in the Port of Singapore. We have recently shortlisted 11 passenger launch and cargo lighter designs to be further enhanced as ready reference designs that harbour craft owners can adopt. Demand for these designs can be aggregated to help lower overall cost of production. We are also working with Enterprise Singapore to onboard other banks and financial intermediaries to the expanded Enterprise Financing Scheme-Green to offer more options for debt financing. Alternative financial solutions are also being explored, including the creation of special investment vehicles and leasing models, to cater to the different risk management and growth strategies of the harbour craft owners.

As an organisation, MPA closely tracks our sustainability efforts, aligning with the Whole-of-Government GreenGov.SG initiative to peak our GHG emissions around 2025, and achieve



Fortescue, with the support from MPA, government agencies, research institutes, and industry partners, successfully conducted the world's first use of ammonia, in combination with diesel in the combustion process, as a marine fuel onboard the Singapore-flagged ammonia-powered vessel, the *Fortescue Green Pioneer*, in the Port of Singapore between February and March 2024.

net zero around 2045. MPA will be disclosing our environmental sustainability efforts, including the GreenGov.SG indicators – on GHG emissions, electricity utilisation, water efficiency, waste disposal indexes – in our 2023 Sustainability Report.

Embracing Digitalisation for a Smarter Future

Digitalisation remains a key pillar of our strategy to enhance operational efficiency and the overall competitiveness of the Port of Singapore. The launch of the Just-In-Time Planning and Coordination Platform

under Phase 2 of our digitalPORT@SG™ to optimise vessel arrival schedules, and digital bunkering initiative to streamline bunker delivery transactions, are some of the efforts implemented to facilitate services in the Port of Singapore. We have also brought onboard eight classification societies, through a letter of intent signed in April 2023, to develop standards and technical references in support of the maritime decarbonisation and digitalisation, including in areas such as smart and autonomous shipping, cyber security, and electrification.

By collaborating with leading cybersecurity solution providers and maritime stakeholders, the Maritime Cyber Assurance and Operations Centre (MCAOC) was established to aggregate demand for cybersecurity services and address the challenge of the limited talent pool of cyber professionals by pooling and optimising resources to provide security monitoring services and operations at the MCAOC. Manpower currently engaged in monitoring systems can be freed up by organisations to focus on other business priorities. At the Singapore Maritime Week 2024, ten companies, together with international participants from the Port

CHIEF EXECUTIVE'S MESSAGE

Authorities CIO Cybersecurity Network (Pacc-Net) and other like-minded ports and port authorities, completed a tabletop exercise to validate the initial operational capabilities of MCAOC. These include real-time cybersecurity monitoring of members' digital systems, information dissemination on cyber threats to allow swift response, and circulating advisories on system recovery measures.

Empowering Our Maritime Future

The development of our maritime workforce is crucial to sustaining our growth and competitiveness. A record 60 MaritimeONE Scholarships and seven Tripartite Maritime Scholarships were awarded in 2023, while MPA's Global Internship Award welcomed 39 new participants. We also launched the Singapore Maritime Institute-MaritimeONE Postgraduate R&D Scholarship to develop quality local maritime research talent and domain experts. The Sail Milestone Achievement Programme (SailMAP), started in 2022 to encourage upskilling by rewarding seafarers for reaching key career milestones, has already facilitated career advancements for almost 100 seafarers to date.

To upgrade our own staff, MPA has also put in place new training agreements with the American Bureau of Shipping and Lloyd's Register for MPA surveyors, to gain valuable hands-on experience in key areas such as remote surveys and audits, as well as exposure

to cutting-edge technologies, such as energy-efficient batteries and alternative fuels.

At the broader sectoral level, MPA and the Singapore Maritime Foundation (SMF) established a Joint Office for Talent and Skills, which will work closely with industry partners and local tertiary institutions to develop talent pipelines, as well as facilitate training and upskilling of maritime workers. Following the Tripartite Advisory Panel's (TAP) recommendations to enhance manpower development, we have launched the Maritime Energy Training Facility to provide specialised training in the safe handling of alternative fuels, and are also working to introduce a stackable micro-credential training model to support mid-career upskilling.

To attract local talent to join the maritime workforce, we initiated the 'Sea The Difference' campaign, highlighting the diverse career opportunities in the maritime sector, including profiling lesser-known careers, as well as debunking common myths.

Our Vision for Tomorrow

We are mindful of the various challenges that will continue to impact global supply chains going ahead. However, these also present opportunities that can help focus international efforts and bring to bear the collective resources to develop solutions to address these challenges. As the world's busiest transshipment hub and largest

bunkering port, Singapore can play a big role to catalyse the transformation efforts in the sector, tapping on our strong innovation ecosystem and facilitative regulatory environment. There is much that we need to do and can do. I look forward to the continued work with our tripartite partners – industry partners and unions, and our global partners – to make international shipping become more resilient, efficient and sustainable.

Thank you for your unwavering support and dedication to our shared vision. Here's to a more digital, more sustainable, net-zero and innovative future of shipping!

Mr. Teo Eng Dih
Chief Executive
Maritime and Port Authority
of Singapore

MEMBERS OF THE AUTHORITY

(AS AT 31 DECEMBER 2023)



Mr. Niam Chiang Meng

Chairman
Maritime and Port Authority
of Singapore



Mr. Teo Eng Dih

Chief Executive
Maritime and Port Authority
of Singapore



Mr. Abu Bakar Bin Mohd Nor

Group Chairman,
M Kapital Holdings Pte Ltd



Mr. Chan Cheow Hoe

Government Chief Digital
Technology Officer,
Smart Nation & Digital
Government Office



Dr. Vincent Lien

Managing Director,
Lien Properties Pte Ltd



Ms. Mary Liew

General Secretary,
Singapore Maritime
Officers' Union



Mr. Jermaine Loy

Principal Private
Secretary to Prime Minister,
Prime Minister's Office



Mr. Chris Ong Leng Yeow

Chief Executive Officer,
Seatrium Ltd,
Seatrium Offshore
& Marine Ltd



Mr. Esben Poulsen

Executive Chairman,
Enesel Pte Ltd



Mr. Sng Seow Wah

Corporate Advisor,
Temasek International



A/Prof. Simon Tay

Associate Professor,
Faculty of Law,
National University of Singapore;
Chairman, Singapore Institute of
International Affairs



Mr. Teo Choo Wee

Director,
PIL Holdings Pte Ltd



RADM Sean Wat

Chief of Navy,
Republic of Singapore Navy



Ms. Caroline Yang

President,
Singapore Shipping
Association



Mr. Yee Ping Yi

Deputy Secretary,
Strategy, Sustainability &
Technology,
Ministry of Transport

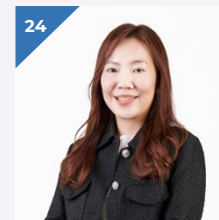
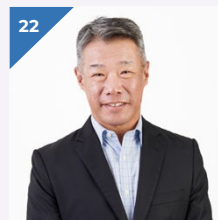
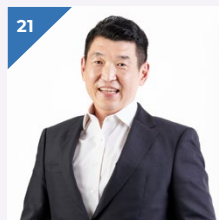
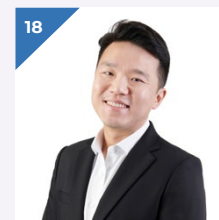
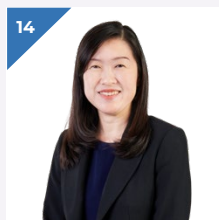
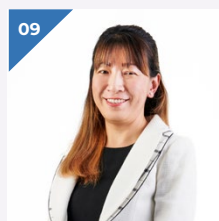
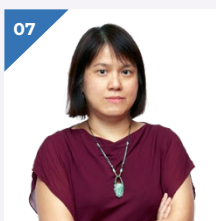
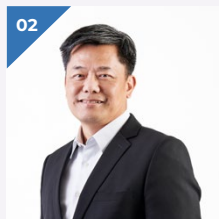
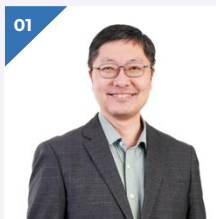


Ms. Patricia Yim

Member of the Authority

SENIOR MANAGEMENT

(AS AT 31 DECEMBER 2023)



- 01 Mr. Teo Eng Dih**
Chief Executive
- 02 Mr. David Foo**
Assistant Chief Executive (Operations Technology)
- 03 Mr. Kenneth Lim**
Assistant Chief Executive (Industry & Transformation)
Quality Service Manager
- 04 Capt. M Segar**
Assistant Chief Executive (Operations)
- 05 Mr. Tan Hoe Soon**
Assistant Chief Executive (Corporate & Strategy)
Chief Risk Officer
- 06 Ms. Tan Beng Tee**
Senior Advisor

- 07 Ms. Angela Png**
Senior Legal Advisor & Corporate Secretary
- 08 Capt. Dakanashamoorthy Ganasen**
Senior Director, Operations & Marine Services
- 09 Ms. Cindy Sim**
Senior Director, Finance, Procurement & Admin
- 10 Ms. Tan Woei Tyng**
Senior Director, International Maritime Centre
- 11 Er. Tham Wai Wah**
Senior Director, Engineering & Project Management
Chief Engineer / Chief Sustainability Officer

- 12 Mr. Cheah Aun Aun**
Director, Shipping / Director, Marine
- 13 Ms. Chua Chen Yun**
Director, Internal Audit
- 14 Ms. Caroline Goh**
Director, Business Capability Development
- 15 Mr. George Goh**
Director, Communications & Community
- 16 Mr. Dennis Khoo**
Director, Maritime Systems & Technology
- 17 Mr. Koh Chin Yong**
Chief Information Officer / Director Information Technology
- 18 Mr. Jason Leong**
General Counsel

- 19 Mr. Ng Yi Han**
Director, Innovation, Technology & Talent Development / Chief Transformation Officer
- 20 Mr. Tan Suan Jow**
Dean of MPA Academy
- 21 Mr. Vince Tan**
Director, Operations Transformation & Planning
- 22 Mr. Thai Low Ying-Huang**
Chief Hydrographer
- 23 Mr. Benjamin Wong**
Director, Strategy & Policy
- 24 Ms. Yeo Suat Lay**
Director, Human Resource

CORPORATE GOVERNANCE

Organisation and Structure

MPA is a statutory board under the Ministry of Transport which oversees all the statutory bodies in the transport sector. It was established and incorporated under the Maritime and Port Authority of Singapore Act. The Board, headed by a non-executive Chairman, sets strategic directions for MPA to achieve its mission and fulfil its roles as laid out in the Act. Appointed by the Minister for Transport for a three-year term, Board Members include MPA's Chief Executive, senior officials from the public sector and industry and union representatives.

The following Board Committees are also established by the Board to oversee various matters and activities:

- Audit Review Committee
- Data and Cybersecurity Committee
- Investment Committee
- MINT Fund Steering Committee
- Registration Committee
- Senior Personnel Board
- Welfare Committee for Seafarers

Board meetings are held on a bi-monthly basis to deliberate and approve important matters on governance, operations, policy and sustainability. These matters reflect the key material issues addressed in this report.

MPA's 21 divisions are headed by divisional Directors or Senior Directors, who are responsible for managing the day-to-day operations of their divisions.

Disclosure of Compensation

The fees for the chairperson, members of the Board and remunerations of the Senior Management team, are pegged to the guidelines of the Public Service Division.

(as at 31 December 2023)



INVESTMENT COMMITTEE

Chairman

Mr. Niam Chiang Meng

Members

Mr. Teo Eng Dih
Dr. Vincent Lien
Mr. Chris Ong
Mr. Sng Seow Wah
Mr. Abu Bakar

Secretary

Director (Finance,
Procurement & Admin)



SENIOR PERSONNEL BOARD

Chairman

Mr. Niam Chiang Meng

Members

Mr. Teo Eng Dih
Mr. Abu Bakar
Ms. Patricia Yim

Secretary

Director
(Human Resource)



AUDIT REVIEW COMMITTEE

Chairman

Dr. Vincent Lien

Members

RADM Sean Wat
Ms. Caroline Yang
Mr. Sng Seow Wah
Mr. Jermaine Loy

Secretary

Head
(Internal Audit)



WELFARE COMMITTEE FOR SEAFARERS

Chairman

Ms. Mary Liew

Members

Mr. Esben Poulsson
Mr. Teo Choo Wee

SSA

Mr. Deepak Arora
General Manager
Maritime Human Resources
NYK Shipmanagement Pte Ltd

PSA Corporation

Mr. Goh Teck Chin
Assistant Vice
President (Safety and Health)
PSA SG HSSE Division

Jurong Port Pte Ltd

Mr. Chen Xinjia Norman
Head, Strategic
Management Department

Seafarers' Missions

Mr. Toh Soon Kok
Port Chaplain
Mission to Seafarers Singapore

Rev. Carl Bjarkam
Port Chaplain
Danish Seamen Church

MPA

Senior Director
(Engineering &
Project Management)

Director (Shipping)

Secretary

Deputy Director
(Seafarer Management)



REGISTRATION COMMITTEE

Chairman

Mr. Teo Choo Wee

Members

Ms. Caroline Yang
Ms. Mary Liew
Mr. Jermaine Loy

Secretary

Director (Shipping)



DATA AND CYBERSECURITY COMMITTEE

Chairman

Mr. Niam Chiang Meng

Members

Mr. Teo Eng Dih
Mr. Chan Cheow Hoe
Mr. Chris Ong
Mr. Teo Choo Wee

IMDA

Ms. Aileen Chia

Secretary

Chief Information
Officer



MINT FUND STEERING COMMITTEE

Chairman

Prof. Lui Pao Chuen

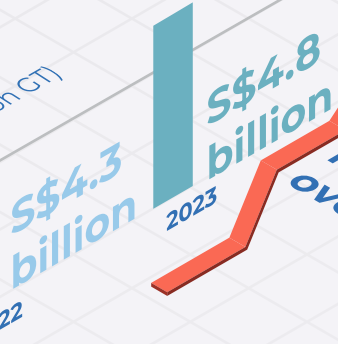
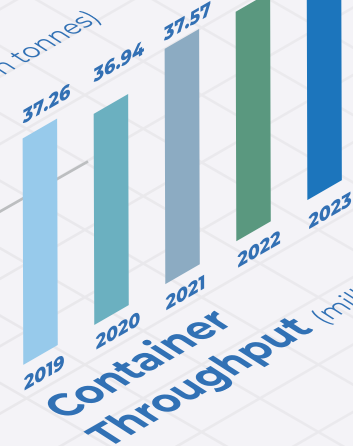
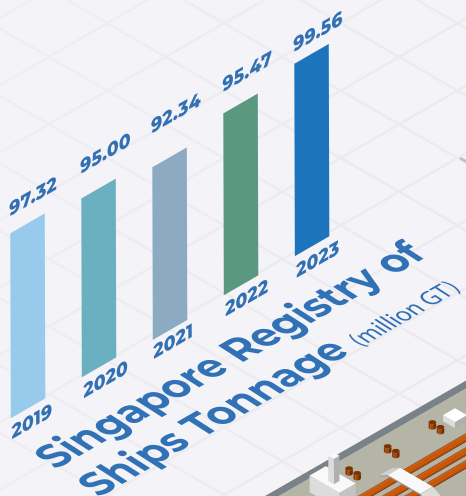
Members

Mr. Teo Eng Dih
Mr. Esben Poulsson
A/P Simon Tay
Ms. Patricia Yim

Secretary

Director (Innovation,
Technology and
Talent Development)

2023 PERFORMANCE SUMMARY



25 maritime companies established

¹ 2023 figures comprise conventional bunker, LNG bunker, biofuel blends bunker and methanol bunker.

CHAPTER 1

Ensuring a Safe, Efficient and Sustainable Global Hub Port

In 2023, the Maritime and Port Authority of Singapore (MPA) continued to pursue its mission to maintain and enhance the safety and efficiency of the Port of Singapore. From overseeing the smooth operation of cargo and passenger terminals to managing the safe navigation of a variety of vessels in the busy Singapore Strait, our commitment to safety has been unwavering. At the same time, MPA remains keenly focused on our commitment to accelerate digitalisation and decarbonisation, contributing to efforts to make global maritime supply chains more resilient and sustainable.



Ensuring a Safe, Efficient and Sustainable Global Hub Port

SAFETY

FEREX: Elevating Maritime Safety through Advanced Exercises

MPA conducted its annual Ferry Rescue Exercise (FEREX) to validate the effectiveness of the Ferry Mishap Contingency Plan and Whole of Government (WoG) tiered response plan. The exercise was part of the 10th edition of the International Safety@Sea Week (IS@S) and involved IS@S participants, 13 Government Agencies, and ferry operators.



A simulated medical evacuation of a critically injured passenger by the RSAF during the annual FEREX at the 10th International Safety@Sea Week.

For the first time, the exercise scenario focused on an electric ferry mishap, emphasising preparedness for potential battery-operated craft incidents in Singapore waters. The exercise simulated a thermal runaway, leading to a fire in the battery compartment, requiring passenger evacuation, medical treatment, and fire containment efforts. Objectives included increasing awareness, understanding risks associated with electric vessel fires, and validating the Whole of Government (WoG) tiered response plans.

Medevac Operations and Rescue Missions in 2023

The number of major maritime incidents in the Port of Singapore remained low in 2023. The total number of safety incidents per 100,000 vessel movements dropped from 8.7 in 2022 to 8.2 in 2023 – more than half of that in 2018 (17.8).

MPA was involved in nine search and rescue operations, and nine medical evacuations in 2023. These operations – coordinated by MPA's Maritime Rescue Coordination Centre (MRCC) with agencies, such as the Republic of Singapore Air Force (RSAF), the Republic of Singapore Navy (RSN), the Police Coast Guard (PCG) and the Singapore Civil Defence Force (SCDF) – demonstrate MPA's readiness and efficiency in handling maritime emergencies.



Emergency responders from the SCDF participating in the multi-agency FEREX at the 10th International Safety@Sea Week.

01

Missing Singapore-registered vessel, SUCCESS 9, found

Following a distress call on 10 April 2023 from the Singapore-registered SUCCESS 9 reporting that it had been boarded, MPA took the lead in coordinating a multinational search effort to locate the ship. All nearby and passing commercial ships were mobilised to assist in the search for the vessel.



The vessel's location was finally discovered on 15 April when the commercial ship MONJASA SPRINTER intercepted its distress call while passing by. The Information Fusion Centre (IFC) at the Changi Command and Control Centre (CC2C) and the Monrovia Regional Maritime Rescue Coordination Centre (MRCC) were immediately notified of the situation. Subsequently, a Côte d'Ivoire Navy patrol vessel was deployed to confirm and board SUCCESS 9, leading to the safe and healthy recovery of all crew members.



The MPA team coordinating the search for the missing SUCCESS 9 vessel.

This search operation, spearheaded by MPA, involved the active participation of various entities, including the RSN, the IFC, and maritime administrations from several West African nations. The successful outcome of this operation underscored the pivotal role played by MPA and highlighted the significance of international cooperation in ensuring maritime safety.

02

Ferry fire and transfer incident

Following a fire in the engine room of the ferry QUEEN STAR 2 on 5 May 2023, passengers were safely transferred to another ferry, MERBAU ERA, and brought to the Regional Ferry Terminal at HarbourFront Centre. MPA's CARE Team and other emergency units coordinated effectively to ensure passengers were safe and their needs taken care of. There were no reported injuries in this incident.

03

Rescue of partially submerged Indonesian vessel

On 13 August 2023, MPA received a distress call from an Indonesian-flagged wooden craft at risk of sinking near Changi. MPA responded promptly, dispatching two patrol boats and a Police Coast Guard boat. All 12 persons on board were safely evacuated, while the craft was secured and towed to safety.

Ensuring a Safe, Efficient and Sustainable Global Hub Port

Efficiency

Enhancing Operational Efficiency through Technology

MPA continues to enhance its operational efficiencies and systems performance through its digitalisation efforts, acquisition of new technology and implementation of various upgrade of its systems.

Delivery of the Next-Generation Hydrographic Vessel, *Mata Ikan*

July 2023 marked the arrival of the next-generation hydrographic vessel, *Mata Ikan*, a 35-metre long craft featuring state-of-the-art design and technology. Its optimised hull form, designed using computational fluid dynamics, enhances seakeeping and reduces resistance. Equipped for various hydrographic missions,

Mata Ikan carries multibeam echosounders, side scan sonars, and has the capability to deploy USVs and remotely operated vehicles (ROVs). Its multi-functional design, including buoy laying capabilities, significantly elevates the efficiency of MPA's Hydrographic Division's operational capabilities.

Utilising an Unmanned Surface Vessel (USV) in Hydrographic Surveys

MPA recently acquired a battery-powered USV, equipped with a multi-beam echosounder and a high-precision real-time kinematic positioning-Global Navigation Satellite System (RTK-GNSS). This addition significantly enhances MPA's capabilities in bathymetric data collection, particularly in shallow areas where traditional survey vessels may risk grounding.



The battery-powered Unmanned Surface Vessel will enhance MPA's capabilities in bathymetric data collection.



MPA's next-generation hydrographic vessel, the *Mata Ikan*, is equipped for diverse hydrographic missions.

Vessel Traffic Information System (VTIS) Mid-Life Upgrade

The 4th generation Vessel Traffic Information System (VTIS) plays a critical role in sea traffic management, handling over 120,000 vessels arriving in the Port of Singapore annually. Since its operationalisation in 2011, the 4th generation VTIS underwent a mid-life upgrade in 2021/2022 to enhance MPA's vessel traffic management operations. This included refreshing the VTIS servers with virtual machine technologies, thus reducing the equipment footprint by about 50 per cent and improving the efficiency of our VTIS maintenance tasks. Completed in the second quarter of 2023, this upgrade cements MPA's commitment towards using technologies to reap operational efficiencies.

Radar Enhancements for Improved Vessel Detection

As part of MPA's ongoing efforts to enhance maritime safety, MPA carried out and completed an upgrade of the radar systems at four of MPA's remote sites in 2023. These new radars are based on state-of-the-art solid-state technology and superior in terms of reliability, performance and energy efficiency compared to the existing magnetron-based ones, thus enhancing our vessel detection capabilities within waters under Singapore VTIS' area of monitoring.

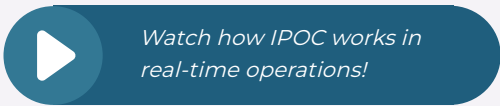
MPA also completed the integration of one of the PCG's radars with our VTIS in 2023, further bolstering MPA's VTIS radar capabilities and strengthening overall system redundancy.

Ensuring a Safe, Efficient and Sustainable Global Hub Port

Enhancing Incident Management and Safety Enforcement

The Integrated Port Operations C3 (IPOC) is an artificial intelligence-enabled (AI) system which aims to enhance situational awareness for vessel activities in our port waters and enable timely responses to incidents. Data from various agencies, such as PCG, RSN and SCDF, will be integrated through the IPOC system, supported by machine learning and AI, to enable comprehensive coverage and automated alerts.

Phase 1 of the IPOC system was delivered in 2023, augmenting MPA's capability in managing maritime incidents and streamlining daily maritime safety enforcement operations. The IPOC system provides a common situation picture to aid incident managers, augmented with sensemaking capabilities for real-time anomaly detection. The system is currently undergoing sea trials and user training, and set to go live in the first quarter of 2024.



Watch how IPOC works in real-time operations!


Integrated Port Operations C3 (IPOC) System

Objective

To strengthen MPA's incident response management and safety enforcement capabilities across the full spectrum of operations, thus improving operational efficiency and effectiveness.


Key Features

Enhanced Situational Awareness




Allows users to see more and see faster through a common maritime situation picture and with real-time operational updates anytime and anywhere.

Improved Incident Management Workflows




Uses machine learning and artificial intelligence to help users make quicker and better decisions when managing time-critical maritime incidents.

Agile Development Approach



Delivers novel technologies and solutions over time through short development cycles and in close collaboration with end users.

Enhanced Whole-of-Government Collaboration



Strengthen collaboration with the Ministry of Transport and Republic of Singapore Navy through proactive sharing of information and data.

Deployment of Maritime 5G Phase 1

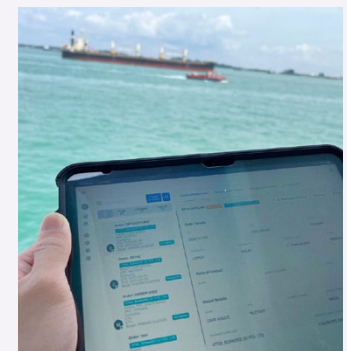
Three maritime 5G base stations were operationalised in 2023, in collaboration with IMDA and MI, to support the testing and development of data-intensive and low-latency solutions such as telemedicine services at sea, maritime drones and autonomous vessels, to improve safety, effectiveness, and efficiency in maritime operations. Other maritime services such as digital bunkering would also benefit from the availability of 5G in our port waters.

The remaining base stations will be set up in 2024 and 2025, which once completed, will provide full maritime 5G coverage in Singapore's major anchorages, fairways, terminals, and boarding grounds.

Implementing the World's First Digital Bunkering Initiative



Watch how Fullerton Health Group uses 5G to provide telemedicine services for crew onboard vessels



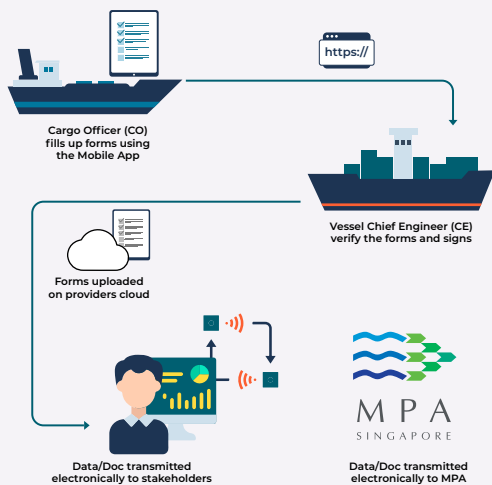
Top and left: With digital bunkering, Cargo Officers and Chief Engineers can complete the pre- and post-bunkering processes without filling any physical documents, enhancing the efficiency and transparency of bunkering operations in Singapore.

On 1 November 2023, MPA launched the digital bunkering initiative, introducing processes and documentation like electronic

Ensuring a Safe, Efficient and Sustainable Global Hub Port

bunker delivery notes (e-BDNs), a first for any port worldwide. This initiative, having undergone over 100 trials with more than 20 participating companies since January 2023, marks a huge step forward in enhancing efficiency and transparency of bunkering operations in Singapore, and is estimated to save close to 40,000 man-days per year for the bunker industry.

MPA has whitelisted digital bunkering solutions for adoption by the industry to ensure conformance to standards, baseline functionality, risk management and regulatory reporting requirements. MPA will also be exploring further enhancements, such as the use of smart data logger and transmission of Mass Flow Meter (MFM) profile. The implementation of digital bunkering initiative is an opportunity for business transformation for the industry to digitalise operations and upskill their workers.



Phase 2 of digitalPORT@SG™ and Just-In-Time (JIT) Operations

Under digitalPORT@SG™ Phase 2, the JIT Planning and Coordination Platform was rolled out last year. The Just-In-Time Planning and Coordination Platform provides incoming vessels with their estimated time of berthing, allowing them to route their journey more efficiently and save on fuel costs and time. Marine services providers can optimise their resources to minimise waiting times for customers.

The JIT platform, rolled out on 1 October 2023, is operational for container vessels heading to PSA Terminal and bulk vessels heading to Jurong Port, with approximately 90 liners/agents of container/bulk vessels, and all bunker operators and towage providers, successfully onboarded.

The platform facilitates optimal arrival and departure of vessels, enabling faster ship turnaround times and reducing dwell time at anchorages. This in turn leads to the reduction of carbon emissions, while also improving operational efficiency at the Port of Singapore.

Key Aspects of digitalPORT@SG™ Phase 2: Just-In-Time (JIT) Operations



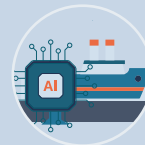
Reduction in Vessel Dwell Time:
By facilitating better coordination and scheduling, which in turn leads to quicker turnaround times for ships.



Impact on Carbon Emissions:
By streamlining vessel arrivals and departures, environmental footprint of port operations is minimised.



Facilitation of Just-In-Time Operations:
By facilitating optimal vessel passage planning for ships to arrive in port on time, especially for a busy port like Singapore, vessel traffic is more safely and effectively managed.



Optimisation of Anchorage Space:
By utilising AI, the active anchorage management module – to be released in 2024 – will ensure more efficient use of limited anchorage space to support the growth of vessels calling at the port, in turn leading to faster and safer operations.

MPA's Renewable Energy Masterplan

MPA is continuing efforts to ramp up solar deployment at our existing facilities and upcoming building projects, including exploring the viability of erecting solar photovoltaic (PV) canopy structures at Tuas Port and MPA's piers to maximise generation of green electricity.

In addition, MPA will commence with the first phase of the Renewable Energy Masterplan for Pulau Satumu, where Environmental Impact Assessment and conceptual design for integration of the solar PV and energy storage system on the island will be carried out. When completed, Pulau Satumu will be energy self-sufficient and powered entirely by green electricity. MPA is also exploring other forms of renewable energy, such as tidal and wind energy.



Ensuring a Safe, Efficient and Sustainable Global Hub Port

Delivering Tuas Next-Generation Port

Tuas Port, envisioned to be the world's largest fully-automated, intelligent, and sustainable container terminal at a single location, represents the future of Maritime Singapore. When completed in the 2040s, Tuas Port will have a handling capacity of 65 million TEUs, almost double the volume that is currently handled. The Next-Generation Port, together with Singapore's International Maritime Centre, will form a strong value proposition and ensure Maritime Singapore remains trusted, resilient and ready for the future.

Tuas Port Phase 1

Reclamation works for Tuas Port Phase 1 had been completed. MPA, in collaboration with partners – such as the National University of Singapore's (NUS) Centre of Excellence in Modelling and Simulation for Next Generation Ports (C4NGP), A*STAR's Institute of High Performance Computing (IHPC), and the Technology Centre for Offshore and Marine, Singapore (TCOMS) – has pioneered the development of an operational digital twin for automated container terminal operations at Tuas Port Phase 1. This digital simulation allows for the evaluation and optimisation of terminal layouts, which facilitates strategic planning in response to disruptions in global supply chains.



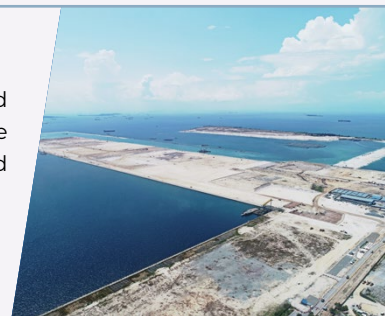
The joint MPA-NTU-PSA team behind the innovative Rigid Inclusion Piles foundation system, a more cost-effective and sustainable solution.

MPA collaborated with NTU and PSA on the R&D project to develop an innovative Rigid Inclusion Piles foundation system, to replace traditional reinforced concrete piles used for container yards. The system will not only be more cost-effective and quicker to construct but can also be demolished easily in the future when the land is redeveloped. Unlike the traditional reinforced concrete piles, this method can potentially result in a large reduction in carbon footprints with green concrete without steel reinforcements.

The pilot load test at PSA Tuas Port Phase 1 was successfully completed in 2023 with positive results and feedback from BCA.

Tuas Port Phase 2

As of 2023, the construction of Tuas Port Phase 2 has crossed the 60 per cent completion mark. Key milestones include the completion of all 227 caissons for the retaining wall and the land reclamation for the first three container berths.



Aerial view of Tuas Port Phase 2

MPA is studying the impact of rising sea levels on Tuas Port, and is developing coastal adaptation solutions for Tuas Port Phases 2 and 3, in consultation with PSA. MPA also worked with PUB to incorporate updated protection planning parameters. MPA had also incorporated the latest NEA-Centre of Climate Research Singapore climate projection findings, in the Site-Specific Engineering Study for MPA facilities on offshore islands.

Tuas Port Phase 3

Preparatory works for Phase 3 have commenced, focusing on soil investigation and the design of containment bunds. The award for the tender to engage a multi-disciplinary team for the engineering and design of Phase 3 is slated for the second quarter of 2024.



Exploring the use of treated landfill mixed materials for reclamation of Tuas Port Phase 3.

MPA is partnering with the National Environment Agency (NEA) to explore using treated landfill mixed materials from Semakau Landfill as an alternative to sand for the reclamation works for Phase 3 of the Tuas Port development. To enable safe usage of mixed materials for land reclamation, MPA and NEA are working with a geotechnical and environmental consultant, as well as institutes of higher learning, to study the excavation and treatment of the landfilled mixed materials. If found to be viable, this initiative will reduce a large amount of sand required for reclamation fill and prolong the lifespan of our Semakau Landfill site. Reclamation works for Phase 3 are expected to be completed in the mid-2030s.

Ensuring a Safe, Efficient and Sustainable Global Hub Port

Tuas Ecosystem Working Group

To spearhead port-industry integration, the Next-Generation Port steering committee commissioned five sub-working groups under the Tuas ecosystem working group on industry value chain, multi-modal transport connectivity, decarbonisation, adaptation and digitalisation.

These sub-working groups will study and develop synergistic solutions across each domain, and chart long-term strategic plans to develop a vibrant and sustainable Tuas ecosystem, ensuring that Tuas Port remains at the forefront of maritime development.

Enhancing Tuas Port Accessibility: Tripartite Committee for Transport Connectivity

The Tripartite Committee for Tuas Port Connectivity, a collaborative group of government agencies, PSA Corporation, and maritime unions, focuses on improving the commute for port workers to and from Tuas Port. Initiatives have included upgrading road infrastructure and optimising public transport schedules in the Tuas area.

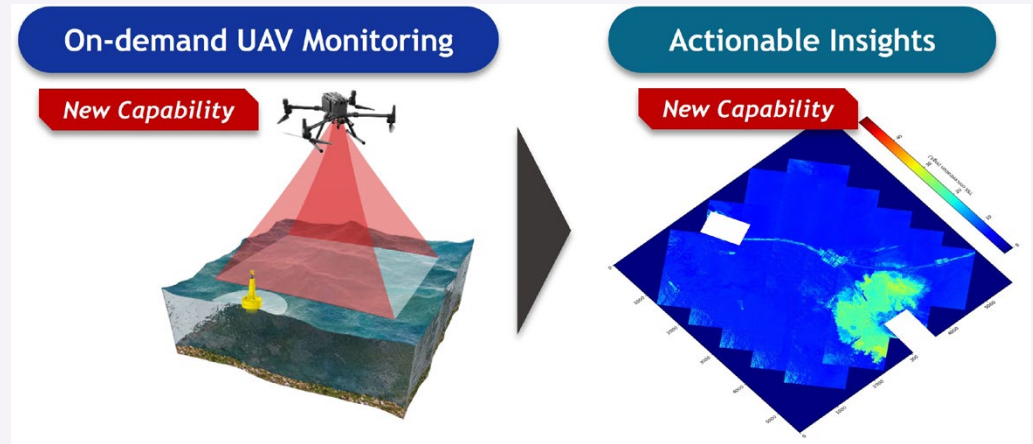
AI-Enabled Multispectral Imaging for Environmental Monitoring

The complex coastal environment poses many logistical challenges for the deployment of Unmanned Aerial Vehicles (UAV) for real-time monitoring of marine operations, such as land reclamation and dredging.

A collaboration between MPA, the Nanyang Technological University (NTU), and DHI has led to the development of an Unmanned Aerial Vehicle-based turbidity monitoring system using AI and multispectral imaging.

An agency-academia-industry collaboration between MPA, the Nanyang Technological University (NTU), and DHI Water & Environment (S) Pte Ltd has led to the development of Singapore's first UAV-based turbidity monitoring system using AI and multispectral imaging. This innovative technology allows for rapid response to potential breaches of Environmental Quality Objectives during dredging and reclamation works.

Recognised for its innovation, this technology clinched the Merit Award at the Minister's Innovation Award 2023.



Top: On-demand UAV monitoring with actionable insights for environmental monitoring.

Left: Test flight of a UAV equipped with multispectral camera at Tuas.

CHAPTER 2

Strengthening Singapore's Position as a Leading International Maritime Centre

Singapore is home to over 180 international shipping groups as well as many other maritime service providers engaged in finance, insurance, shipbroking, law and arbitration. Key maritime companies continue to contribute significantly to economic activity with more than S\$4.8 billion total business spending in 2023.

MPA has remained agile and responsive to industry needs by adopting new ways to promote Singapore as an international maritime centre and a gateway to the region, complemented by a transparent and trusted legal system, political and economic stability, and a highly-skilled and culturally adaptive workforce.



Strengthening Singapore's Position as a Leading International Maritime Centre

Singapore is the Top Maritime Centre in Xinhua-Baltic Index for 10th Consecutive Year

Singapore topped the Xinhua-Baltic International Shipping Centre Development Index for the 10th consecutive year. The Xinhua-Baltic Index is an annual ranking that evaluates and lists the performance of the world's largest cities as international shipping centres.

Singapore Named "Best Global Seaport" and "Best Seaport in Asia" at 2023 Asian Freight, Logistics, and Supply Chain (AFLAS) Awards

At the 2023 AFLAS Awards organised by Asia Cargo News, the port of Singapore was awarded the "Best Global Seaport" for the third consecutive year, and received the "Best Seaport in Asia" award for the 35th time. These awards, determined by reader votes, recognise the port's pivotal role in the global supply chain and its leadership in maritime decarbonisation and transformation efforts.

Positioning Singapore as the maritime green finance hub

MPA initiated an Expression of Interest (EOI) in October 2023 to encourage the adoption of electric harbour craft in the domestic sector, by seeking innovative solutions to reduce financial barriers and risks. The EOI attracted nearly 20 proposals from financial institutions, intermediaries, marine insurance providers and brokers, offering green financing and insurance solutions to promote the uptake of electric harbour craft among owners and operators in Singapore.

Beyond the domestic harbour craft sector, MPA partnered the Monetary Authority of Singapore (MAS) to develop a taxonomy of eligible assets and activities to encourage maritime companies in adopting incremental solutions. The taxonomy helps standardise the language on green shipping, as well as guide investors in their decision-making process.

RANK	SHIPPING	FINANCE & LAW	MARITIME TECHNOLOGY	PORTS & LOGISTICS	ATTRACTIVENESS & COMPETITIVENESS	OVERALL RANK
1	ATHENS	NEW YORK	SINGAPORE	SHANGHAI	SINGAPORE	SINGAPORE
2	SINGAPORE	LONDON	OSLO	ROTTERDAM	LONDON	ROTTERDAM
3	TOKYO	TOKYO	BUSAN	SINGAPORE	COPENHAGEN	LONDON
4	SHANGHAI	OSLO	LONDON	HONG KONG	ROTTERDAM	SHANGHAI
5	HAMBURG	PARIS	SHANGHAI	GUANGZHOU	OSLO	TOKYO

Singapore was also ranked first in 'The Leading Maritime Cities of the World 2022' report by Menon Economics and DNV.

MAS' Singapore-Asia Taxonomy for Sustainable Finance


Desired Outcomes

Credible green and "transition" definitions and interoperability with other global taxonomies to:


- Align and steer concerted private and government financing
- Reduce potential greenwashing and reputational risks
- Promote cross-border financing flows

TAXONOMY FEATURES


Environmental Objectives




Climate change adaptation




Climate change mitigation



Biodiversity protection




Resource resilience




Pollution prevention and control


Eight Focus Sectors




Energy




Industrial




Carbon Capture & Sequestration




Agriculture & Forestry




Construction/Real Estate



Waste/Circular Economy



Information & Communications Technology



Transportation

Traffic Light System

- **Green:** Activities that are operating at near zero emissions or are on a 1.5°C- aligned pathway
- **Amber:** Activities that are moving towards a green transition pathway within a defined time frame or are facilitating significant emissions reductions in the short term with a prescribed sunset date.
- **Amber (measures):** Decarbonisation measures that enable an activity to improve and align with 'green/amber' over a defined time period.
- **Ineligible:** Activities that do not align with 'green/amber' or are not yet assessed and beyond the scope of the taxonomy.

Choice Location for Companies Seeking to Expand in the Asia-Pacific Region

In 2023, Maritime Singapore continued to see growth, with more than 25 maritime companies expanding or establishing new activities, including setting up decarbonisation desks in Singapore. These companies include the shipping arms of international trading firms, such as COFCO and Asyad. Singapore continues to attract new businesses, as well as new investments by companies already in Singapore, due to our city-state's strategic

position and robust maritime infrastructure, making it an attractive destination for global traders and maritime businesses.

An example is A.P. Moller-Maersk (Maersk), which has enhanced its omnichannel-fulfilment capabilities with World Gateway 2 in Jurong West, a 1.1 million sq. ft. facility set to finish in the first quarter of 2025.

Several ancillary service providers also expanded their operations, including Idwal – a vessel inspection company –

Strengthening Singapore's Position as a Leading International Maritime Centre

which established its Asia headquarters in Singapore, as well as Simpson Spence Young – which set up a financial advisory outfit here to complement its ship brokerage services. Another shipbroker, BRS Shipbrokers launched its chemical broking desk in Singapore.

Among maritime services companies that had set up decarbonisation desks in Singapore were Itochu, which established its green desk in Singapore to look into value chain for green fuel bunkering and transportation.

These developments not only highlight Singapore's strategic importance in global shipping routes, but also reflect its ability to attract diverse maritime businesses, fostering a dynamic and innovative maritime ecosystem.

Singapore to host International Congress of Maritime Arbitrators (ICMA) XXIII in 2026

The Singapore Chamber of Maritime Arbitration (SCMA) is a specialist arbitration institution which provides a neutral, cost-effective and flexible framework for maritime and international trade arbitrations that is responsive to the needs of industry users. Its global and regional members hail from all sectors of maritime, trade and arbitration communities.

SCMA won the bid for Singapore to host the International Congress of Maritime Arbitrators (ICMA) XXIII in 2026. ICMA is a prestigious thought leadership platform for the global maritime arbitration community. This reaffirms Maritime Singapore's aspirations to be a leading international maritime centre and hub for maritime dispute resolution.

Supporting Maritime Businesses: Maritime Cluster Fund and Maritime Sector Incentive

The Maritime Sector Incentive (MSI) and Maritime Cluster Fund (MCF) are pivotal in supporting the growth of Singapore's maritime cluster. The MSI offers tax concessions to businesses setting up or expanding their maritime operations in Singapore, while the MCF focuses on facilitating upskilling, reskilling, and transformation efforts. Qualifying MSI companies may also enjoy withholding tax exemption on qualifying payments for ship and container financing.

In 2023, more than 3,200 locals benefitted from the MCF through co-funding of their training and upskilling programmes. Since its launch in 2013, the MCF has supported about 70 digitalisation projects.

Proactive Credit Management Policies

MPA collects port dues for services provided to ocean-going vessels that call at our port. To insure itself against the risk of defaults, MPA currently requires all billing parties that are billed more than S\$5,000 annually to furnish a security deposit or banker's guarantee.

As part of MPA's regular review of our processes to find better ways to achieve our policy and regulatory objectives, while reducing regulatory and compliance costs, from 1 April 2024, MPA will waive the need for security deposits and banker's guarantees



Participants of the 2023 SRS Forum held on 26 October 2023.

for billing parties that MPA assesses to be of lower credit risk.

The move is expected to benefit about 80 per cent of MPA's existing billing parties, and improve businesses' cashflow by more than S\$20 million each year. This initiative underscores our commitment to facilitating a business-friendly environment while maintaining fiscal prudence and risk management.

The Singapore Registry of Ships (SRS) – Charting a Course of Excellence in Maritime Governance

The Singapore Registry of Ships (SRS) continues to rank among the top 10 global registries. The SRS, representing the maritime flag of Singapore, has become

synonymous with setting high safety standards, efficiency, and a commitment to environmental sustainability. Administering about 4,000 vessels, aggregating nearly 100 million gross tonnage (GT) in 2023, the SRS is among the world's largest ship registries with one of the youngest quality fleets.

In 2023, 22 newly Singapore-registered ships also received Green Ship Certificates under the Green Ship Programme, rewarding SRS ships for their efforts in reducing the environmental impact of their fleets. MPA more of such greener ships to use Singapore as their flag of choice in the coming years, and we will continue to work with shipping companies in adopting low- and zero-carbon fuels and energy-efficient technology and designs in their fleets.

Strengthening Singapore's Position as a Leading International Maritime Centre

Achievements in the Tokyo and Paris MOUs on PSC

SRS has consistently demonstrated its commitment to maritime safety and environmental sustainability within the frameworks of the Tokyo and Paris Memoranda of Understanding (MoUs) on Port State Control (PSC) performance. These MoUs, integral to regional maritime governance, collectively aim to eliminate substandard shipping practices, enhance maritime safety, protect the marine environment, and improve the living and working conditions of seafarers aboard ships.

The Tokyo MoU (TMOU) involves 22 member authorities in the Asia-Pacific region, including Singapore, while the Paris MOU (PMoU) has 27 member authorities in Europe. Together, these organisations work to eliminate substandard shipping, enhance maritime safety, safeguard the marine environment, and improve living and working conditions of seafarers onboard ships.

SRS has consistently met the standards of TMOU and PMoU on the performance of our ships – both safety and environmental – in accordance with international rules and regulations. In its latest annual reports¹, which outlines the performance of ships in 2022, SRS climbed to 2nd position in the TMOU Flag Administration performance rankings, and advanced to 6th in the PMoU rankings.

These achievements demonstrated our unwavering commitment to ensure that our fleet consistently exceeds expectations, in terms of both safety and environmental stewardship. Through the implementation of rigorous enforcement measures, coupled with proactive engagement with stakeholders, we continuously strive to not only meet but surpass international standards. These achievements underscore our resolve to prioritise the well-being of our crew, protect the environment, and maintain the trust and confidence of all those we serve.



Penguin Refresh was one of 22 Singapore-registered ships that received Green Ship Certificates at the SRS Forum held on 26 October 2023.



Achievements in the Tokyo and Paris MOU Port State Controls

¹ The 2023 TMOU and PMoU Annual Reports is expected to be published in 2024.

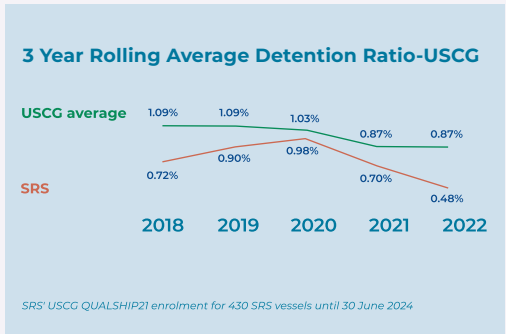
Strengthening Singapore's Position as a Leading International Maritime Centre

Recognition in the United States Coast Guard (USCG) QUALShip 21 Program

The dedication of SRS to ensuring top-notch quality and unparalleled safety standards has garnered international acclaim, exemplified by our consistent qualification in USCG's QUALShip 21 program since 2017.

In 2022², the SRS secured its qualification for the year 2023–2024, with an impressive three-year average detention ratio of 0.48 per cent. This qualification serves as a hallmark of excellence, rewarding flag vessels that exhibit an unwavering dedication to upholding the highest standards of quality and safety in maritime operations.

Our continued inclusion in this programme not only validates our ongoing efforts but also underscores our unwavering pledge to prioritise the well-being of our crew, protect the environment, and ensure the safety and satisfaction of all stakeholders involved.



Singapore Crosses Record Three Billion Gross Tonnage in Annual Vessel Arrival Tonnage

The Port of Singapore achieved a record-breaking annual vessel arrival tonnage of three billion gross tonnage (GT) with the arrival of the ONE OLYMPUS containership on 25 December 2023. This milestone was celebrated at an event organised by MPA on 26 December 2023. Mr. Chee Hong Tat, then Acting Minister for Transport, highlighted the strong tripartite cooperation as the key factor enabling this achievement.



Watch the arrival of ONE OLYMPUS to the Port of Singapore

From top: On 25 December 2023, the 3 billion gross tonnage (GT) mark was crossed with the arrival of the Singapore-flagged containership, ONE OLYMPUS.

The record 3 billion GT in annual vessel arrival tonnage was celebrated at a milestone event organised by MPA.

² The 2023 USCG QualShip 21 Annual Report is expected to be published in 2024.

Strengthening Singapore's Position as a Leading International Maritime Centre

Maritime Forums

Singapore Maritime Week (SMW) 2023:

SMW celebrated its 17th edition from 24-28 April 2023, drawing an impressive gathering of nearly 26,000 participants across 50 events. The week-long event featured a diverse array of activities, including a Ministerial panel discussion, high-level dialogues, conferences, networking receptions, and a trade exhibition.

The overarching theme for SMW 2023 was "Ambition Meets Action", and the programme was organised under Decarbonisation, Innovation, Talent, and Services pillars. The then-Secretary-General of the International Maritime Organization (IMO), Mr. Kitack Lim, delivered the keynote addresses at both the Opening Ceremony and Accelerating Decarbonisation conferences.

Five out of seven candidates for the 2023 IMO Secretary-General election spoke at SMW 2023, representing Bangladesh, China, Dominica, Kenya, and Türkiye. Notably, the event also attracted significant participation from prominent decarbonisation organisations, such as the UN Global Compact, United Nations Framework Convention on Climate Change (UNFCCC) Climate Champions, and UN Foundation.

The event's highlights included the inaugural Ministerial roundtable, featuring the participation of Norway, Denmark, the United Kingdom and Portugal, marking a significant milestone in fostering international collaboration. Besides Mr. Kitack Lim, the Opening Ceremony was also graced by several distinguished keynote speakers, including John Kerry, US Special Envoy for Climate Change.

SMW 2023 marked the revival of the Advanced Maritime Leaders' Programme. MPA hosted 25 participants from 17 countries, in collaboration with the IMO and the World Maritime University. The event also witnessed the signing of eight Memoranda of Understanding (MOUs), including partnerships with the Port of Los Angeles and Long Beach for the Green and Digital Shipping Corridor, and collaborations with eight classification societies for advancing decarbonisation and digitalisation efforts.

More than 1,500 students and members of the public also participated in MaritimeSG Tours, organised as part of the SMW public engagement events. There was a significant increase in the public participation this year compared to the 700 participants engaged in 2022.

The Republic of Singapore Navy (RSN) also participated in SMW for the first time and showcased their Combatant Craft Medium at the Marina South Pier, alongside the MPA Guardian, as part of the SMW public outreach efforts.

Various sustainable practices were also adopted at SMW 2023, including the reduction of single-use materials and maintaining a temperature of 25 degrees Celsius.



Maritime Dialogue



From top: Panellists of the SMW Leaders' Perspectives forum during the Singapore Maritime Week 2023.

Mr. Chee Hong Tat, then Senior Minister of State for Transport, participating in the SMW Maritime Dialogue during the Singapore Maritime Week 2023.

Strengthening Singapore's Position as a Leading International Maritime Centre

Industry Forum on Sanctions' Impact on Shipping:

Held on 7 August 2023, the MPA Academy-organised seminar, "The Impact of Sanctions on Shipping," attracted an audience of over 280 participants. This event provided a platform for industry stakeholders to discuss the immediate impact of the Russian-Ukraine conflict on vessel operations, trade routes, insurance operations, and also how international shipping could manage these trade interruptions, and potentially the longer term impact on maritime routes.

The seminar featured three distinguished speakers: Mr. Jayendu Krishna, Director-Deputy Head Maritime Advisers of Drewry Maritime Services (Asia); Mr. Tony Paulson, Head of Asia and Corporate Director at West of England P&I; and Mr. Stephen Harper, Head of Legal – Shipping – at BW Group. The Q&A session was moderated by Mr. Punit Oza, MPA Academy Senior Adjunct Fellow.

International Safety@Sea (IS@S) Week 2023:

The 2023 International Safety@Sea Week, opened by then Acting Transport Minister Mr. Chee Hong Tat, focused on "Advancing Maritime Safety in a Green and Digital Age". Held between 23 and 27 October, the event included eight sessions, including the main International Safety@Sea Conference, two safety forums, FEREX participant programme,

and industry visits to MPA's Port Operations Control Centre and PSA's Innovation Centre.

The event drew over 1,300 participants from 20 countries, and featured 28 industry thought leaders from various global maritime organisations – IMO, the Australian Maritime Safety Authority, Danish Maritime Authority, US Coast Guard, International Association of Classification Societies, Oil Companies International Marine Forum and The Nautical Institute. Discussions centred around operationalising methanol bunkering, building a cyber safe and resilient maritime ecosystem, and using technology to strengthen maritime safety.

Singapore Registry of Ships Forum 2023:

Held on 26 October 2023, the Forum, titled "Safe, Secure, and Sustainable Shipping", attracted over 350 participants. Discussions spanned seafarers' training for new fuels, regional maritime security cooperation, and included a dialogue session with MPA's Chief Executive Mr. Teo Eng Dih on decarbonisation strategies in shipping and its goal of achieving net-zero emissions by 2050. Wan Hai Lines Ltd received the Top Net Tonnage Contributor Award, while 22 Singapore-registered ships were honoured with Green Ship Certificates, recognising their efforts in reducing the environmental impact of their fleet.



Left: The International Safety@Sea Week was launched by then Acting Minister for Transport, Mr. Chee Hong Tat.

From top right: Mr. Tony Paulson, Head of Asia and Corporate Director at West of England P&I, speaking at the MPA Academy seminar, "The Impact of Sanctions on Shipping".

Wan Hai Lines Ltd received the Top Net Tonnage Contributor Award at the Singapore Registry of Ships Forum 2023.

A panel discussion on maritime decarbonisation at the 2023 SRS Forum.



CHAPTER 3

Safeguarding Singapore's Strategic Maritime Interests

With one-third of world trade volumes funnelled through the Straits of Malacca and Singapore (SOMS), our city-state lies at the heart of the global supply chain. The MPA is actively involved in regional and international collaborations to protect and promote Singapore's maritime interests. These include the promotion of maritime and port connectivity, navigational safety, and the protection of the marine environment.

As Singapore's national maritime representative, MPA participates actively and assumes leadership positions in key international bodies, such as the IMO, the International Hydrographic Organization (IHO) and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), among others.

Safeguarding Singapore's Strategic Maritime Interests

Singapore Re-elected to IMO Council

Singapore was successfully re-elected to the IMO Council for a 16th consecutive term at the 33rd Session of the IMO Assembly on 1 December 2023.

As an IMO Council Member, Singapore will continue to play an active role serving in leadership positions, contribute towards enhancing navigational safety for the international maritime community, promote efficient and sustainable shipping and protect the marine environment.



Dr. Amy Khor, Senior Minister of State, Ministry of Transport and Ministry of Sustainability and the Environment (centre), and officers from MPA, Ministry of Transport and Ministry of Foreign Affairs at the 33rd Session of the IMO Assembly.

Singapore re-elected to the IALA Council

Singapore was successfully re-elected to the IALA Council for a four-year term (2023–2027) at the 14th IALA General Assembly on 3 June 2023. MPA also renewed its MoU with IALA to support the training and capacity building of IALA National Members. As a Council member, Singapore will continue to contribute to the

development of standards, recommendations and guidelines on aids to navigation, vessel traffic services and e-navigation.

MPA Appointments in Key International Committees

Vice-Chair of the IMO Marine Environment Protection Committee (MEPC)

Mr. Tan Hanqiang from MPA, previously First Secretary (Maritime), was re-elected Vice Chair of MEPC for a second term in July 2023 at MEPC's 80th Session. As Vice-Chair, Hanqiang also chairs the Steering Committee overseeing the comprehensive impact assessment of measures to reduce greenhouse gas (GHG) emissions from international shipping, aligning with the 2023 IMO Strategy on Reduction of GHG



Mr. Tan Hanqiang was re-elected Vice Chair of IMO's Marine Environment Protection Committee for a second term in July 2023.

Emissions from Ships in July 2023 – where Singapore worked with fellow IMO Member States to build consensus around a strengthened and inclusive GHG emissions reduction strategy.

Chair of the IMO Council Working Group on the Strategic Plan

MPA's Mr. Darrick Leow, Counsellor (Maritime) at the High Commission of the Republic of Singapore to the United Kingdom (UK) was appointed as Chair of the Working Group at the 129th session of the IMO Council held in July 2023. As Chair, Singapore successfully facilitated discussions on the development of the IMO Strategic Plan for 2024-2029, with the finalised text adopted by the 33rd session of the IMO Assembly in December 2023.



Mr. Darrick Leow, was appointed Chair of the IMO Council Working Group at the 129th session of the IMO Council held in July 2023.

Building consensus to address climate change

The 80th session of the Marine Environment Protection Committee (MEPC 80) saw the successful adoption of the 2023 IMO Strategy on Reduction of Greenhouse Gas (GHG) Emissions from Ships, which sets out enhanced targets for international shipping, including a target to reach net-zero GHG emissions by or around, i.e. close to 2050, taking into account different national circumstances. The adoption by all IMO Member States by consensus, without reservations, was a clear demonstration of the collective will in addressing climate change. The 2023 IMO Strategy also sends a strong and unequivocal signal to the global maritime community on the way ahead, which will help strengthen investment confidence in newbuilds and infrastructure development along the fuel supply chain.

Singapore welcomes these developments at the IMO and is actively supporting ongoing work to achieve the targets set out in the 2023 IMO Strategy. This includes ongoing work by the IMO's Steering Committee on the comprehensive impact assessment of the basket of candidate mid-term measures, coordinated by Singapore as the Vice-Chair of MEPC and to ensure that the implementation of the Strategy and development of the candidate mid-term measures are effective and inclusive.

New 2023 IMO Targets



Carbon intensity of the ship to decline through further improvement of the energy efficiency for new ships



To decline carbon intensity of international shipping



To increase uptake of zero or near-zero GHG emission technologies, fuels and/or energy sources



GHG emissions from international shipping to reach net zero

Safeguarding Singapore's Strategic Maritime Interests

Chair of the IMO STCW Convention and Code Comprehensive Review:

MPA's Capt. Zheng Yi, Deputy Director (Seafarers Skills Upgrading, Certification and Accreditation) chaired the IMO Working Group on the Comprehensive Review of the 1978 Standards of Training, Certification, and Watchkeeping (STCW) Convention and Code, which aims to keep seafarer's training, certification and watchkeeping aspects in line with developments in the shipping industry, and address several challenges faced by seafarers. The Working Group met from 7 to 9 February 2023 at the ninth session of the IMO's Sub-Committee on Human Element, Training and Watchkeeping (HTW9) to establish the aims and principles that would lay the groundwork for the comprehensive review of the STCW Convention and Code.

As Chair, Singapore will continue to lead and actively participate in the discussion of the Comprehensive Review to contribute our views and safeguard our interests.



Capt. Zheng Yi, Deputy Director (Seafarers Skills Upgrading, Certification and Accreditation), chairing the IMO Working Group on the Comprehensive Review of the 1978 Standards of Training, Certification, and Watchkeeping (STCW) Convention and Code.

Co-Chair of the UN Global Geospatial Information Management Working Group on Marine Geospatial Information:

MPA's Dr. Parry Oei was appointed as the Co-Chair in August 2023. As Co-Chair, Dr. Oei continues to promote the use of internationally agreed-upon geospatial information frameworks and established standards, to improve the growing inter-dependent relationships between people and the marine environments. In addition, Dr. Oei continues to support the Committee of Experts in the development of norms, principles, guides and standards to increase significantly the availability of high-quality, timely and reliable geospatial information including any regional capacity development initiatives.



Dr. Parry Oei, was appointed Co-Chair of the UN Global Geospatial Information Management Working Group on Marine Geospatial Information in August 2023.

Vice-Chair for 34th Tokyo MoU Port State Control Committee (PSCC):

MPA's Mr. Chen Kit Jam, Senior Deputy Director (Shipping) was elected as Vice-Chair for a new 3-year term in October 2021. The PSCC, consisting of representatives from the member Authorities, co-operating member

Authorities and observers, meet annually to discuss and manage the implementation as well as on-going operation of the Tokyo MoU.

As Vice-Chair, Kit Jam plays a significant role in the annual discussions and management of the Tokyo MoU, widely regarded as the foremost Port State Control regime. His contributions amongst others, include serving as Leader of the Intersessional Group for APCIS (Asia-Pacific Centralised Information System) backup, which considers functional strategies to safeguard the regional PSC database from various forms of threats, such as cyber-attacks from external sources.

Kit Jam also successfully led missions under the Tokyo MoU to promote harmonisation on PSC throughout the Asia-Pacific region, as well as leading 'fact-finding' mission to specific IMO member State to assess whether the qualitative criteria have been fulfilled by an authority applying for membership to the Tokyo MoU.



Mr. Chen Kit Jam, Senior Deputy Director (Shipping), elected as Vice-Chair for the 34th Tokyo MoU Port State Control Committee (PSCC).

Safeguarding Singapore's Strategic Maritime Interests

Advancing Maritime Leadership: Highlights from 2nd IAP Meeting and 8th PAR 2023

Maritime International Advisory Panel (IAP) 2nd Annual Meeting

The Maritime International Advisory Panel (IAP) conducted its second annual meeting from 25 to 26 April 2023, during the Singapore Maritime Week (SMW) 2023. Established in 2022 by the Ministry of Transport (MOT) and MPA, the IAP seeks international perspectives on key long-term trends shaping the maritime industry.

Discussions were led by Mr. Chee Hong Tat, then Senior Minister of State for Finance and Transport. The two-day session convened global business leaders to exchange ideas on seizing opportunities in digitalisation and sustainability. Six new members joined the IAP, and local industry and union leaders provided valuable perspectives.

8th Port Authorities Roundtable (PAR) 2023: Global Port Transformation in Shanghai

MPA initiated the Port Authorities Roundtable (PAR) in 2015 and is currently serving as the PAR Secretariat. PAR provides a platform for port authorities to exchange best practices, discuss common issues, and foster collaborations.

The 8th edition of PAR held in Shanghai in September 2023 focused on the theme "Seizing New Opportunities Amidst Global Port Transformation." Seventeen port authorities from the Americas, Asia, Europe, the Middle East, and Oceania participated.

Discussions centred on three key areas: global port and shipping trends, decarbonisation, and digitalisation. MPA's Chief Executive, Mr. Teo Eng Dih, delivered a presentation titled "Navigating the Pathways towards a Net-Zero Port", emphasising MPA's commitment to climate action for a future net-zero emissions port.



The Maritime International Advisory Panel held its second annual meeting during the Singapore Maritime Week 2023.

MoUs signed at Port Authorities Roundtable 2023 hosted in Shanghai and the sidelines of 3rd Global Sustainable Transport Forum in Beijing

MPA signed several MoUs with key partners in China to enhance collaboration in various areas.

MPA-Shanghai Municipal Transportation Commission

Signed at PAR 2023 in Shanghai, the MoU aims to strengthen port and maritime ties between Shanghai and Singapore. It seeks to facilitate mutual learning through information exchange on port and shipping developments, maritime policies and regulations, as well as training and research. Additionally, the MoU aims to co-develop digitalisation and decarbonisation solutions for shipping and port development. This collaboration is significant as Shanghai is one of China's key transshipment centres and plays a crucial role in the development of the Yangtze River delta.



Mr. Teo Eng Dih, MPA Chief Executive (right), with Mr. Yu Fulin, Director General of Shanghai Municipal Transportation Commission (left), at the signing of the MoU between MPA and the Shanghai Municipal Transportation Commission.

MPA-Tianjin Port and Shipping Authority

This MoU focuses on discussing issues related to maritime digitalisation and decarbonisation, exchanging information and experiences on shipping and regulatory framework, and facilitating maritime talent exchanges and collaborative opportunities in areas such as maritime research and development.



Mr. Teo Eng Dih, MPA Chief Executive (seventh from right), with Mr. Wang Honghai, Director-General of Tianjin Port and Shipping Authority, (sixth from left) at the signing of the MoU between MPA and the Tianjin Port and Shipping Authority

MPA-China Classification Society (CCS)

MPA and CCS aim to explore collaborations to reduce GHG emissions through the use of zero or near-zero emission marine fuels and marine battery technology under this MoU. They also plan to co-innovate smart ship technologies with researchers, industry, and maritime startups through platforms, such as PIER71™ and support the development of maritime talent and training through maritime scholarship programmes and internship opportunities. Headquartered in Beijing, CCS is a full member of the International Association of Classification Societies with a global presence.



Mr. Teo Eng Dih, MPA Chief Executive (second from left), with Mr. Sun Feng, Chairman and President of China Classification Society (third from left), at the signing of the MoU between MPA and China Classification Society.

Safeguarding Singapore's Strategic Maritime Interests

Enhancing Maritime and Port Connectivity through Strategic MoUs

MPA and the Vietnam Maritime Administration (Vinamarine) signed an MoU on Maritime Cooperation on 9 February 2023, and the exchange of the MoU was witnessed by the Prime Ministers of Singapore and Vietnam. Under this MoU, MPA and Vinamarine will explore collaboration to address common maritime challenges, co-develop practical solutions and exchange views on areas including maritime digitalisation, port state control inspection, maritime training and green shipping.

MPA Joins the International Association for Classification Societies (IACS) and Maritime Technologies Forum

On 30 November 2023, MPA and the International Association of Classification Societies (IACS) signed a Letter of Intent (LOI) at the sidelines of the 33rd session of IMO Assembly (A33) in London, to collaborate on various maritime digitalisation and decarbonisation initiatives. Under the LOI, both parties will consider the development of technical standards and unified requirements to ensure that new maritime solutions are safely implemented.

The LOI will focus on key areas such as smart and autonomous ships, digitalisation and cybersecurity, marine electrification, and the use of zero- and low-carbon fuels onboard vessels. As part of the collaboration, both parties will have regular information

and knowledge exchange, including discussions on industry challenges and opportunities, standards, best practices, and emerging technologies.

MPA was also welcomed as an associate member to the Maritime Technologies Forum (MTF) – which counts among its founding members ABS, DNV, Lloyd's Register, ClassNK, Japan's Maritime Bureau, Ministry of Land, Infrastructure, Transport and Tourism, the Norwegian Maritime Authority, and the UK's Maritime and Coastguard Agency.

MPA brings regulatory expertise, technology, innovation experience, and networks to the partnership, collaborating with classification societies and Flag States on research and projects related to safe testing, crew training, and the adoption of alternative fuels. This helps strengthen MTF's collaborative approach to advancing safety and sustainability in the maritime industry.

Reinforcing Commitment to Maritime Safety and Environmental Protection

From 31 July to 4 August 2023, Singapore hosted the 14th Co-operation Forum, the 46th session of the Tripartite Technical Experts Group, and the 14th Project Coordination Committee meeting. The forum attracted nearly 200 delegates from over 60 countries and organisations. It provided a platform for collaborative dialogue among the three littoral States, user States, alongside the wider international maritime community, on critical issues of navigational safety and environmental conservation in the SOMS.



From top left: Mr. Teo Eng Dih, MPA Chief Executive (right) with Mr. Nguyen Dinh Viet, then-Acting Administrator of Vinamarine (left) at the signing of the MoU on Maritime Cooperation between MPA and Vinamarine.

Mr. Teo Eng Dih, MPA Chief Executive (left), with Mr. Nick Brown, Chair of the International Association of Classification Societies (IACS) (right), signed the Letter of Intent between MPA and IACS.

Mr. Chee Hong Tat, then Acting Minister for Transport, delivering his opening address at the 14th Co-operation Forum.

Participants at the 14th Co-operation Forum held between 31 July and 4 August 2023.

Safeguarding Singapore's Strategic Maritime Interests

Championing Global Cyber Governance

At its 107th session, the IMO Maritime Safety Committee (MSC) agreed to include the revision of cyber risk management guidelines in the agenda of the 108th MSC session.

Recognising evolving cyber threats, the revised guidelines aim to enhance maritime safety and security, while remaining flexible for different maritime industry players to adapt the appropriate measures for their own practices and activities.



Members of the IPMCS attended the annual Global Maritime Transport System Cyber Security Symposium 2023 in Sydney, Australia.

MPA and the Cyber Security Agency of Singapore (CSA) are part of the Singapore team involved in the International Partnership for Maritime Cyber Security (IPMCS), a joint working group comprising members from Australia, Denmark, Netherlands, the UK, and the United States, to draft the updated guidelines.

Leading Data Harmonisation and Standardisation at IMO

MPA's Data and Compliance Division collaborates with various international organisations, such as the International Organization for Standards (ISO), the United Nations Economic Commission for Europe (UNECE), the World Customs Organization (WCO), and the IMO Expert Group on Data Harmonization (EGDH). MPA also contributes to the development of the IMO Compendium, focusing on data elements and models for the Maritime Single Window, Just-in-Time, and lessons from other maritime shipping use-cases.

Successful Handover of IMO-Singapore SWiFT Project in Port of Lobito, Angola

MPA, in partnership with the IMO and World Bank, developed the Maritime Single Window (MSW) system under Project SWiFT (Single Window in Facilitation of Trade). This initiative, building on Singapore's digital transformation success, involved stakeholder engagement with the Port of Lobito and the IMO secretariat. A handover ceremony was held to mark the completion and delivery of the project. The MSW platform enables electronic data submission through one online portal for efficient ship clearance, aligning with global maritime digitalisation and decarbonisation goals per the IMO's FAL Convention amendments.

The SWiFT project, a joint effort by IMO and Singapore, assists medium-sized ports in establishing digital connectivity to meet FAL Convention requirements, with close collaboration with Angolan stakeholders to tailor the MSW platform for Lobito Port's needs.

Expanding Maritime Education and Training

Launch of New Enhanced Technical Co-operation & Training Package for IMO and Member States

MPA – through its training arm, the MPA Academy (MPAA) – has been advancing global maritime leadership and technical skills training since 1998. MPAA collaborates with the IMO under the Singapore-IMO Third Country Training Programme to strengthen the capacity of IMO Member States.

Marking the 75th anniversary of the IMO Convention and 25 years of the IMO-Singapore partnership, Singapore has committed US\$5 million from 2024–2028 for enhanced technical cooperation and training. This fund will support fellowships, scholarships, workshops, and courses for IMO members, with an initial allocation of US\$2 million for 2024–2025.



MPA's Mr. Gavin Yeo, Deputy Director (Industry & Decarb Products) (third from right) at the handover ceremony of the IMO-Singapore SWiFT Project at the Port of Lobito, Angola.

Collaboration with International Partners



World Maritime University (WMU)

MPAA is committed to enhancing international partnerships and knowledge exchange with leading maritime institutions. A notable event was hosting the largest group of WMU Masters students, with 35 attendees from 20 countries, from 5 - 9 June 2023. This visit, focusing on maritime leadership development and capacity building, was part of their field studies in Port and Shipping Management & Logistics.

Japan Coast Guard (JCG)

In collaboration with JCG under the Japan-Singapore Partnership Programme, MPAA conducted the 15th Maritime Safety Management course in 2023 from 15 to 19 May 2023. This course, aimed at officials from 14 countries, focused on maritime safety awareness.

Indonesian Directorate General of Sea Transportation (DGST)

From 14 to 15 December 2023, MPA and DGST held the 17th meeting of the DGST-MPA Training MoU, coinciding with the 8th DGST-MPA Officers Dialogue. Over 17 years, this MoU has facilitated over 110 programmes and workshops for more than 1,700 officials. Training focuses on implementing IMO conventions, enhancing navigational safety, marine environmental protection, and maritime leadership.

CHAPTER 4

Advancing Maritime Decarbonisation

As a low-lying island, Singapore is particularly susceptible to the adverse effects of climate change. As the steward of our global hub port and international maritime centre, MPA is playing an active role to help steer global shipping towards the IMO's 2023 GHG emission targets for international shipping through strategic collaborations like the Green and Digital Shipping Corridors and establishing common standards, paving the way for smoother technology adoption to accelerate decarbonisation of the maritime sector.

We are also building an ecosystem to support electric harbour craft operations in the Port of Singapore and are making investments in developing renewable energy, including tidal, solar and wind. We have committed to the public sector's target to peak emissions around 2025 and to achieve net zero emissions around 2045 under the GreenGov.SG initiative.



Advancing Maritime Decarbonisation

Green and Digital Shipping Corridors (GDSCs)

In 2023, MPA initiated multiple GDSCs with global partners, serving as testbeds to trial new technologies and fuels, as well as support the scale-up of green and digital maritime solutions for wider adoption.

GDSC with Rotterdam

Singapore established a GDSC with the Port of Rotterdam in 2022. Since then both ports, together with more than 20 partners, have been working towards reducing GHG emissions from this international shipping corridor by 20 per cent, striving for 30 per cent by 2030, compared to 2022. Both ports have since have taken steps to adopt similar bunkering standards and safety frameworks to accelerate the adoption of zero and near-zero emission fuels on the trade route.

In 2023, a modelling study led by one of the partners, the Mærsk Mc-Kinney Møller Center for Zero-Carbon Shipping, and supported by the ports, has explored multiple alternative fuels, including synthetic and bio-variants of methanol, ammonia, LNG, and hydrogen. Working groups have been established to address deployment of these fuels, including demand and supply, standards, safety procedures, financing, and regulations. Additionally, efforts are underway to address gaps in regulation and financing for low carbon fuels, with a focus on incentivising the uptake of alternative fuels.



22 global value chain partners across shipping lines, fuel suppliers, port authorities and operators, industry coalitions, banks, leading institutes of higher learning and knowledge partners gathered at the third Green Corridor workshop held in Rotterdam in September 2023.

GDSC with Port of Los Angeles (POLA) and Port of Long Beach (POLB)

MPA, along with POLA and POLB, supported by C40 Cities, have signed a MoU to establish a GDSC to accelerate the transition to low- and zero-emission fuels by ships calling at Singapore and the San Pedro Bay port complex. A Partnership Strategy for a GDSC across the Pacific Ocean was unveiled at the United Nations Climate Change Conference and associated meetings in December 2023 (COP28/CMP18/CMA5) to coordinate decarbonisation efforts, establish consensus on green shipping best practices, improve access to technology and digital solutions, and leverage networks to scale the uptake of zero and near-zero emission technologies, fuels, and energy sources. A partnership structure and governance mechanism have been developed to provide clarity on the roles and responsibilities of GDSC partners, and processes for onboarding new participants,

financial management, confidentiality, and decision-making have been outlined.

As next steps, the ports and C40 have commissioned a study to analyse trade flows and vessel traffic between Singapore, Los Angeles, and Long Beach, estimating the quantity of near-zero and zero-emission fuels required for this traffic and identifying opportunities for collaboration to advance the development of the GDSC.

GDSC between Tianjin and Singapore

MPA and the People's Republic of China's Tianjin Municipal Transportation Commission signed a MoU to establish the Singapore – Tianjin GDSC, marking the first between Singapore and China. The GDSC aims to support the decarbonisation, digitalisation, and growth of the maritime industry in the Bohai Region. The corridor will serve as a testbed for both countries to pilot and trial digital solutions, alternative fuels, and technologies, and facilitate talent development to support the decarbonisation and digitalisation of shipping.

The collaboration involves working with the research community, institutes of higher learning, and industry stakeholders to enable more efficient port clearance through digital exchanges, encourage the offtake of zero or near-zero GHG emission fuels and adoption of new fuel technologies, spur innovation, support the growth of the maritime startups community, and facilitate manpower training and professional development.



Mr. Teo Eng Dih, MPA Chief Executive (right), with Mr. Wang Zhinan, Director General, Tianjin Municipal Transportation Commission (left) signed the MoU to establish Singapore – Tianjin Green and Digital Shipping Corridor on 6 December 2023.

Advancing Maritime Decarbonisation

GDSC between Japan and Singapore

The Singapore Ministry of Transport (MOT) and the Ministry of Land, Infrastructure, Transport and Tourism of Japan (MLIT) signed a memorandum of cooperation (MoC) to establish the Singapore – Japan GDSC. This marks the first Green and Digital Shipping Corridor between Singapore and Japan, aiming to develop standards and best practices supporting the decarbonisation, digitalisation, and growth of the maritime industry.

The collaboration involves the MPA working with six Japanese ports – the Port of Tokyo, Port of Yokohama, Port of Kawasaki, Port of Osaka, Port of Kobe, and Port of Nagoya – which are key nodes for major economic regions in Japan. These ports will embark on pilot projects and trials for alternative marine fuels such as ammonia and hydrogen, develop bunkering infrastructure and standards, encourage the adoption of technologies to decarbonise port infrastructure and digital solutions, and exchange information and best practices on maritime cybersecurity risks.



Mr. Teo Eng Dih, MPA Chief Executive (sixth from left), with Ms. Yuki Tanaka, Director-General for International Affairs (seventh from right), with the signed MoC to establish Singapore – Japan Green and Digital Shipping Corridor.

GDSC between Australia and Singapore

In June 2023, MPA and Australia’s Department of Infrastructure, Transport, Regional Development, Communications, and the Arts (DITRDCA) commenced discussions to explore areas of cooperation in green and digital shipping and agreed to establish a Singapore – Australia GDSC by the end of 2025. An MoU was signed on 5 March 2024 to formalise collaboration to establish the Singapore – Australia GDSC. The signing of the MoU was welcomed by the Prime Ministers of Singapore and Australia during their 9th Annual Leaders’ Meeting.

Both countries will work with interested partners to explore facilitating digital information exchange to enable efficient port clearance, port calls and flow of vessels, as well as develop zero or near-zero GHG emission fuel supply chains for the maritime industry, the latter includes building necessary infrastructure, formalising standards, developing and implementing the training requirements.

In addition to the MoU, MPA and Australia’s Commonwealth Scientific and Industrial Research Organisation (CSIRO), supported by Singapore’s Agency for Science, Technology and Research (A*STAR), are working to collaborate on research and development projects, and pilots under the Australia-Singapore Initiative on Low Emissions Technologies for Maritime and Port Operations (ASLET). First announced in 2021, the ASLET will support the Singapore – Australia GDSC outcomes.



MPA Chief Executive Mr. Teo Eng Dih (right), with then IMO Secretary-General Mr. Kitack Lim (centre), and Mr. Sveinung Ofteidal, Specialist Director, Norwegian Ministry for Climate and Environment (left) at the signing of the MoU to support maritime decarbonisation activities under the GreenVoyage2050 Project and NextGEN Connect initiative.

Strengthening Partnerships for a Sustainable Maritime Future

MoU to Assist Developing Countries Reduce Emissions

IMO, the Ministry of Climate and Environment of Norway, and MPA signed an MoU to support developing countries in reducing emissions from ships and in ports. This collaboration involves the sharing of knowledge, experience, and best practices, and was signed during the 14th Intersessional Working Group on GHG Emissions Reduction at the IMO Headquarters in London on 20 March 2023.

The initiative is within the frameworks of the NextGEN Connect initiative and the GreenVoyage2050 Project. The NextGEN Connect initiative, established in April 2022,

aims to bring industry, academia, and global research centres together to offer inclusive solutions for maritime decarbonisation. The GreenVoyage2050 Project, established in May 2019, with funding from the Government of Norway, supports developing countries in implementing the Initial IMO Strategy on the Reduction of GHG Emissions from Ships.

Advancing Maritime Decarbonisation

Workshop on GHG Reductions by Shipping Routes and Maritime Hubs

A workshop was convened in Singapore on 5 and 6 October 2023 to discuss the role of shipping and maritime hubs in reducing GHG emissions. Organised by the IMO, MPA, and the Ministry of Climate and Environment of Norway, the workshop aimed to foster cooperation along shipping routes and encourage actions to lower GHG emissions from ships. Forty participants from various countries participated in the two-day workshop where they were also briefed on a route-based action plan methodology developed by the Lloyd's Register Maritime Decarbonisation Hub (LR MDH).



MPA Chief Executive Mr. Teo Eng Dih (left) with H.E. Eivind S. Homme, Ambassador, Royal Norwegian Embassy (centre), and Associate Professor Chai Kah Hin, NUS Centre for Maritime Studies (right), at the IMO-Singapore NextGEN Connect workshop to discuss shipping routes and maritime hubs' actions to cut shipping's GHG emissions.

Inaugural MPA-C40 Green Ports Forum

The first in-person MPA-C40 Green Ports Forum was held as part of a collaboration between Singapore and the global city network, C40, to address climate change. The forum brought together participants from 11 ports and eight cities to discuss the role of green ports in reducing emissions, focusing on the development of new maritime fuel supply chains, green shipping and financing, and the establishment of green shipping corridors.



Participants of the MPA-C40 Green Ports Forum visiting the Singapore Maritime Gallery.

Launch of LR MDH "Routes-based Action Plans: A Toolkit" Report

The LR MDH report titled "Routes-based Action Plans: A Toolkit", launched at the Voyage to Net-Zero Forum at the 28th United Nations Climate Change Conference (COP28/CMP18/CMA5), highlighted the critical role of regional hubs in connecting demand clusters with fuel supply sources for a low-carbon maritime future. The report was developed by LR MDH, a joint initiative between Lloyd's Register and the Lloyd's Register Foundation, in partnership with IMO, MPA, and the Norwegian Ministry of Environment and Climate, as part of the NextGEN Connect-GreenVoyage2050 project.



Representatives of Clifford Capital, Lloyd's Register Maritime Decarbonisation Hub, NUS Centre for Maritime Studies, MPA, C40 and Port of Los Angeles at the Voyage to Net-Zero Forum during the 28th United Nations Climate Change Conference in December 2023.

Letter of Intent (LOI) with Classification Societies and International Association of Classification Societies (IACS)

MPA signed a LOI with eight Registered Organisations (ROs) and the International Association of Classification Societies (IACS) to develop common standards to promote wider adoption and technical references tailored to Singapore's requirements, to ensure the safe implementation of new maritime solutions. These solutions will be in areas such as smart and autonomous ships, cybersecurity, marine electrification, and the integration of zero- and low-carbon fuels on vessels.

Electrification of Vessels

Launch of First Electric Passenger Ferries in Singapore

MPA and Shell Eastern Trading Pte Ltd signed a MoU on 17 April 2023 to expand collaboration on maritime decarbonisation efforts in Singapore. This five-year agreement focuses on advancing the adoption of electric harbour craft, developing charging infrastructure, and researching low-and-zero-carbon fuels.

The MoU was signed in conjunction with the unveiling of the first of a series of electric ferries in Singapore, and the first for Shell globally, at the Shell Energy and Chemicals Park on Pulau Bukom. Shell worked with a Singaporean homegrown shipbuilder and shipowner, Penguin International, on this

Advancing Maritime Decarbonisation

first fully-electric ferry service in Singapore. Operating between Pasir Panjang Ferry Terminal and the Shell Energy and Chemicals Park on Pualu Bukom, the electric vessels ferry Shell personnel, contractors, and visitors.



The *Penguin Refresh* is the first of a series of electric ferries in Singapore.

Yinson Hydromover: Singapore's First Fully Electric Cargo Vessel

In November 2023, Yinson GreenTech, alongside the Goal Zero Consortium led by SeaTech Solutions, celebrated the launch of the *Hydromover*, Singapore's first fully electric cargo vessel. The vessel was one of the three winning proposals announced by MPA and the Singapore Maritime Institute (SMI). The *Hydromover* serves as a living lab and will facilitate R&D in vessel hydrodynamics, propulsion, motor dynamics, and battery performance, in collaboration with the Singapore Institute of Technology (SIT) and the Technology Centre for Offshore and Marine, Singapore (TCOMS).



The *Yinson Hydromover* is Singapore's first fully electric cargo vessel.

Penguin Tenacity Hydrogen Fuel Cell Project

Vinssen, a South Korean company specialising in the production of electric and hydrogen hybrid propulsion systems, has embarked on a trial to evaluate hydrogen as a marine fuel. The hydrogen fuel cell system will be installed on the RoRo vessel, *Penguin Tenacity*. The trial, starting in 2024 and spanning a year, aims to convert operational data into real-time insights to assess the system's stability and performance.

Building the Electric Harbour Craft (eHC) Ecosystem

Expression of Interest (EOI) for Design and Promote Adoption of eHC

MPA has concluded an EOI on the design and adoption of electric harbour craft in Singapore.

In February 2024, MPA selected 11 out of 55 proposals for electric passenger launches

and cargo lighter vessels at the close of the EOI. Six proposals reflected higher technology readiness/maturity and readiness to market, while the remaining five proposals demonstrated promising concepts but require further design development. MPA will provide funding from our industry funds to support the enhancement of the designs undertaken by the companies or research institutes. This will help reduce the overall costs for these designs when scaled up and support continuous improvements.

When the designs and prototypes are ready, the participants can progressively market these enhanced eHC reference designs to interested parties and aggregate production demand from the industry. The use of ready reference designs and production at scale is expected to help reap cost savings for companies planning to make the transition to eHCs.

Proposals for Pilot Trials of eHC Charging Points

MPA has called for proposals to set up, maintain, and operate charging stations for eHC at Jurong Port, Marina South Pier, Pasir Panjang Ferry Terminal, PSA Marine - West Coast Base, and Sebarok Terminal, together with the existing licensees and operators of these sites.

In January 2024, MPA announced that Pyxis Energy Pte Ltd, Pyxis Maritime Pte Ltd and SP Mobility Pte Ltd partnership, Seatrium O&G (International) Pte Ltd, and Yinson Electric Pte Ltd have been selected for their vessel charging concepts to be piloted in Singapore. The proposal by Pyxis and SP Mobility will be deployed at Marina South Pier, while MPA will work with Seatrium and Yinson to further develop their concepts prior to testing.



MPA conducted a briefing for the Expression of Interest to encourage the design and adoption of electric harbour craft in Singapore.

Advancing Maritime Decarbonisation

National Charging Infrastructure Standard Development

In partnership with Enterprise Singapore (ESG) and other stakeholders, MPA is developing a technical reference for eHC charging systems to ensure safety and interoperability. This industry consultation to align on the technical specifications will commence in 2024.

Developing an eHC Charging Masterplan with Research Institutes

MPA is collaborating with various agencies including A*STAR and SMI to develop a charging masterplan for eHC. This initiative involves evaluating potential charging sites and understanding the needs and power requirements for eHC operations within the Port of Singapore. Insights from harbour craft users and a pilot charging station at Marina South Pier will contribute towards the development of the masterplan supporting MPA's plans to progressively roll out charging infrastructure for eHC operations in Singapore from 2025.

EOI for Financing and Insurance for Electric Harbour Craft

In October 2023, MPA invited financial institutions and intermediaries to submit financing and insurance solutions through an EOI to help early movers with the higher upfront cost of owning eHCs.



Singapore's first methanol bunkering operation involving a Maersk container vessel, *Laura Maersk*, was successfully completed at the Raffles Reserved Anchorage, with the support of MPA, government agencies and research institutes.

In April 2024, MPA announced it had received 19 financing and insurance proposals. MPA shortlisted proposals from five banks that offer direct debt financing options for harbour craft owners, and will issue a closed call for proposals in the second quarter of 2024 to further select the alternative financing proposals submitted by eight consortia for implementation.

The EOI also saw seven insurance-related submissions, which indicated that the proposed insurance premiums for eHC are comparable to that of conventional harbour craft. MPA will consult the industry on supportive mechanism to right-price the insurance premiums.

Gearing Up for a Multi-fuel Future

The maritime industry is progressively transitioning towards alternative fuels like methanol, ammonia, and hydrogen to foster a more sustainable future. MPA is proactively gearing up to support this diverse fuel landscape, ensuring Singapore remains a leading bunkering hub.

First Methanol Bunkering Operation in the Port of Singapore

On 27 July 2023, Singapore witnessed its first-ever ship-to-containership methanol bunkering operation, servicing Maersk's *Laura Maersk* with 300 metric tonnes of bio-methanol. This landmark operation was

Partners' roles in the first methanol bunkering operation

In preparation for the methanol bunkering operation in Singapore, MPA worked with over 28 agencies, partners and institutes to organise table-top exercises (TTX) and workshops, before carrying out a Ground Deployment Exercise (GDx).

Customised methanol firefighting programme was also conducted by the Co-operative of SCDF Employees Ltd (COSEM) for MPA staff and Hong Lam Marine crew members as part of the preparations for the bunkering operation.

As part of the risk and environmental impact assessment for the methanol bunkering operation, MPA reviewed methanol-related incidents globally and worked with the Meteorological Service of Singapore to provide advance lightning risk warning if required.

A methanol plume model was jointly developed by the Institute of High Performance Computing (IHPC), A*STAR, Tropical Marine Science Institute (TMSI), NUS, and TCOMS, to forecast the dispersion path of the methanol plume in an event of an accidental methanol release and guide operations. During the methanol bunkering operation, researchers from the Cambridge Centre for Advanced Research and Education in Singapore flew drones equipped with methanol detector with plume modelling capabilities and infrared camera from MPA's patrol craft MPA Guardian to augment the detection of potential methanol leaks into the atmosphere and methanol flames in an event of an accidental leak.

These novel capabilities will be further enhanced to support the review of responses to maritime incidents and raise the preparedness of seafarers, marine professionals, and the port ecosystem in Singapore as new marine fuels such as methanol are introduced.

Advancing Maritime Decarbonisation

the culmination of extensive collaborative efforts involving over 28 agencies, focused on ensuring safety through workshops, hazard analyses, and emergency response drills. MPA also collaborated with various organisations to assess risks, develop prevention methods, and enhance emergency response capabilities.

Advanced technologies such as methanol-detecting drones were employed to enhance safety. Insights from this pilot will contribute to developing a technical reference for methanol bunkering in 2024. MPA also shared its experience with IMO to facilitate the adoption of methanol as a marine fuel globally.

EOI for Methanol Bunkering in Singapore

MPA launched an EOI on 14 December 2023, inviting submissions for methanol bunkering solutions in Singapore's port. The EOI seeks comprehensive proposals to address the expected increase in methanol-fuelled vessels, focusing on fuel supply resilience.

MPA is also working with industry partners to study methanol supplies, infrastructure requirements such as terminal facilities and methanol-carrying bunker tankers, seafarers training, and bunkering standards, as part of the broader effort to operationalise methanol bunkering and supply methanol at scale in the Port of Singapore.

Ammonia Power Generation and Bunkering Initiative

Following an initial EOI phase that concluded in April 2023, MPA and the Energy Market Authority (EMA) have shortlisted six consortiums whose proposals will be further developed in a closed Request for Proposal (RFP) to provide a low- or zero-carbon ammonia solution for power generation and bunkering on Jurong Island. This step aims to identify a principal developer that the Government will work with to develop an end-to-end ammonia solution. The initiative positions Singapore as one of the first countries in the world to test and deploy a direct ammonia combustion power plant, as well as support ammonia bunkering for both international shipping and domestic harbour craft.

Emergency Response Workshop for Ammonia Bunkering

In a collaborative effort, MPA, the French Embassy in Singapore, and Innovation Norway hosted a workshop focused on emergency response strategies for ammonia bunkering incidents. Conducted from 24 to 26 May 2023, the event drew over 70 international experts from diverse sectors, including port authorities, emergency response agencies, maritime classification societies, research institutes and knowledge partners, fuel suppliers, as well as shipping lines and charterers. Discussions centred on understanding the risks of ammonia as a marine fuel, exploring mitigation tactics, and establishing protocols for managing potential accidents during its bunkering and use in ship operations.



Representatives from MPA, the French Embassy in Singapore, and Innovation Norway at a workshop on the emergency response strategies for ammonia bunkering incidents.

Advancing Maritime Decarbonisation

Exploring Natural Energy Sources

Tidal Energy: Proof of Value Project for Clean Tidal Energy

MPA has partnered with Bluenergy Solutions to initiate a tidal energy project near Pulau Satumu, aimed at reducing the reliance on diesel for power generation at Raffles Lighthouse (RLH) facilities. This project involves the deployment of four underwater turbines, co-designed with A*STAR's Institute of High Performance Computing, to convert tidal kinetic energy into electricity. The generated power will supply the RLH's non-operational electrical needs, including those of its living quarters. This initiative is part of broader efforts to explore renewable energy sources, with ongoing trials and plans for expanded applications in waterfront and vessel charging facilities.

Wind Energy: Wind Sail Vessels Visit Singapore

Singapore welcomed three wind-powered vessels, in the Port of Singapore. The *Berge Olympus* equipped with four WindWings developed by BAR Technologies and Yara Marine Technologies, made a port call while on voyage between Asia and Brazil. The technology helps the 210,000 DWT dry bulk carrier save fuel and reduce emissions when it sails along routes with favourable wind conditions.

Other wind propelled vessels which called into Singapore were the Singapore-registered *Pyxis Ocean*, similarly equipped with WindWings, as well as the Panama-flagged *Sea Zhoushan* that was fitted with Norsepower rotor sails.

The wind technology utilises the Bernoulli's principle and Newton's Third Law to help vessel harness crosswinds and generate thrust to propel the vessel, hence reducing overall energy demand, saving fuel and lowering emissions.



Photo credit: Berge Bulk

The *Berge Olympus*, a 210,000 DWT dry bulk carrier powered by wind-assisted propulsion, made its maiden voyage to Singapore on 17 October 2023 while on its way from China to Brazil.

Singapore Welcomes Suiso Frontier

In a landmark event, Singapore welcomed the world's first bulk liquefied hydrogen carrier, *Suiso Frontier*, to its port between 31 August and 10 September 2023. The visit involved meticulous safety preparations, including consultations with government bodies, risk assessments, plume modelling, and comprehensive emergency response and evacuation plans. MPA's Emergency Operations Centre was fully operational throughout the carrier's stay to ensure utmost safety.



The world's first bulk liquefied hydrogen carrier, *Suiso Frontier*, arriving at the Port of Singapore in August 2023.

Advancing Maritime Decarbonisation

Driving Sustainable Development and Circular Economy

Net-Zero and Super Low Energy Building Initiatives

As part of its commitment to sustainable infrastructure development, MPA is building three net zero and Super Low Energy buildings set to be completed by 2026/2027. The three buildings – the MPA Building at Tuas Terminal Gateway, the new Maritime House, and The WAVES – are designed to maximise on-site generation of renewable energy, while achieving at least 60 per cent energy savings above the 2005 BCA building codes used as the anchor reference for Green Mark energy savings.

MPA Building at Tuas Terminal Gateway

The innovative building will house MPA's operations and other functions to support port operations in Singapore. The building is expected to be an attractive space option for shipping and port-related companies, and other complementary business, seeking office spaces at the heart of Tuas Port and the wider Tuas ecosystem. The tender for the construction of the building will be launched in the first half of 2024.

Redevelopment of Maritime House

The new Maritime House building will not only continue to provide for seafarer's welfare through exclusive affordable accommodations, but will also be a one-stop international training and research hub and a venue for international forums. The new Maritime House is currently being designed, and tender for the construction works will be called in 2024. Works are expected to be completed by end-2026.

The WAVES at Marina South

"The WAVES", or Waterfront for All, innovation, Enterprise, and Sustainability, at Marina South is envisioned to be a vibrant Integrated Maritime and Lifestyle development. Pioneering an iconic building typology, "The WAVES" comprises the Maritime Hub, Maritime Innovation Labs, Maritime Drone Estates. These cutting-edge facilities is expected to draw interest from promising maritime enterprises seeking test bedding sites. The WAVES is also expected to be a choice location for families, with its scenic waterfront and exciting F&B offerings.



Artist's impression of the new Maritime House building.



Artist's impression of the MPA Building at Tuas Terminal Gateway.

CHAPTER 5

Making Headway in Maritime Digitalisation and Innovation

In 2023, MPA continued to drive forward with a range of digitalisation initiatives aimed at enhancing support for the maritime industry. These efforts encompassed the enhancements to improve operational efficiencies and effectiveness – including the mid-life upgrade of MPA's Vessel Traffic Information System (VTIS), radar enhancements for improved vessel detection, as well as Phase 1 of the Integrated Port Operations C3 (IPOC) System.

MPA also launched new digital initiatives that will define how we operate at sea – such as the Phase 1 deployment of Maritime 5G base stations, the world's first digital bunkering initiative, as well as the Phase 2 implementation of digitalPORT@SG™ and Just-In-Time (JIT) operations.

[Click here to read more about these developments in Chapter 1.](#)



Making Headway in Maritime Digitalisation and Innovation

Digitalisation for Maritime Singapore

Launch of Revamped Maritime Innovation Lab (MIL) 2.0

On 25 October 2023, the MPA unveiled the MIL2.0, in the presence of Dr. Amy Khor, Senior Minister of State, Ministry of Transport and Ministry of Sustainability and the Environment, and industry partners. A dedicated space designed to test new operational concepts and transform MPA's operations model, MIL2.0 seeks to translate research outcomes – from existing and future research grants – into rapid prototyping and deployment products that will support maritime use cases.

MIL2.0 focuses on developing and integrating capabilities across the domains of space, air, sea, sub-sea, cyber, and sustainability for improved efficiency and effectiveness. It also aims to transform our future Integrated Operations Hub (IOH) at The WAVES, as well as help redesign and enhance our officers' job scope to be future-ready.

Building Digital Capabilities with MPA's Product Development & Engineering Team

To further build up technical capability and steer industry transformation in digitalisation and decarbonisation, MPA established the Product Development & Engineering (PDE) team in January 2023 to catalyse the maritime industry's digital transformation.

This team drives innovation in digital products and supports the digital Maritime and MPA transformation objectives, playing a crucial role in the digital future of the maritime industry.

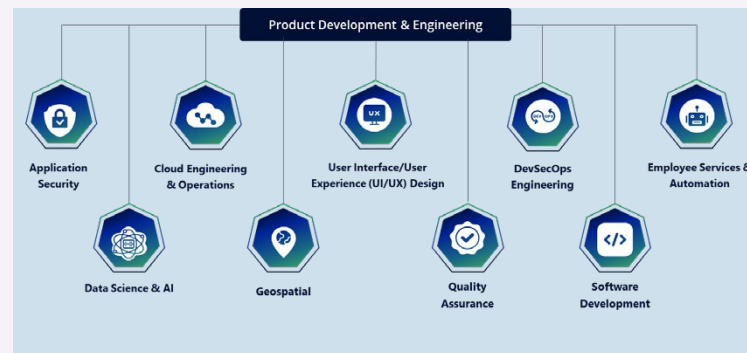
Comprising nine competency centres, the PDE will have the capacity and capability to innovate and deliver IT systems faster, better and more cost-effectively in tandem with operational demands and to support MPA's ambitions in leading industry digital transformation.

Integration with Classification Societies and Maritime Authorities

MPA completed integration with seven Classification Societies – the American Bureau of Shipping, Bureau Veritas, China Classification Society, ClassNK, DNV, Korean Register, and Lloyd's Register – consolidating and storing all e-certificates issued for the Singapore Registry of Ships (SRS). This collaboration with Classification Societies and other maritime authorities facilitates advanced electronic verification of ship certificate information, streamlining port reporting formalities for increased efficiency.



Top and left: Dr. Amy Khor, Senior Minister of State, Ministry of Transport and Ministry of Sustainability and the Environment, visiting the newly launched Maritime Innovation Lab 2.0 on 25 October 2023.



Left: The nine competency centres in MPA's Product Development & Engineering team to support our ambitions in leading industry digital transformation.

Making Headway in Maritime Digitalisation and Innovation

Safeguarding Maritime Singapore Through Fortifying Cyber Resilience

Increasing Resilience with the Maritime Cyber Assurance and Operations Centre (MCAOC)

As our reliance on digital tools and applications grows, our vulnerability to cyber threats increases in tandem. MPA is collaborating with the maritime industry to enhance cyber resilience through the establishment of the MCAOC to strengthen early detection, monitoring, and response to cyber threats.

The pilot implementation of MCAOC will commence in first quarter of 2024. The attainment of full operational status is targeted in 2025. The MCAOC also aims to collaborate with industry players, the research community, and classification societies on joint projects.



MPA's Maritime Data and Cyber Security Department briefing Dr. Amy Khor, Senior Minister of State, Ministry of Transport and Ministry of Sustainability and the Environment, on the Maritime Cyber Assurance and Operations Centre at the MIL 2.0 Opening Ceremony on 25 October 2023.

Enhancing Our Cybersecurity Response

- Ex Cyber Star 23:**
 As the maritime sector lead for cybersecurity, MPA participated in Ex Cyber Star, a WoG cybersecurity exercise in September 2023, testing Singapore's cyber incident management and emergency response plans.
- GRID NetWars:**
 MPA, alongside PSA Corporation and Jurong Port, took part in the inaugural GRID NetWars in September 2023, a cybersecurity ranging exercise focused on industrial control systems and operational technology.
- CIDEX 23:**
 MPA, PSA Corporation, and Jurong Port formed a joint maritime team that participated in the Critical Infrastructure Defence Exercise (CIDEX) held in November 2023, organised by the Singapore Armed Forces. The exercise aimed to prepare and strengthen Singapore's capabilities in handling cyber-attacks in the event of a national emergency.
- PACC-NET TTX 2023:**
 MPA, together with members from the Port Authorities Chief Information Cybersecurity Network (PACC-Net) held the inaugural PACC-Net table-top exercise (TTX) during the Singapore Maritime Week 2023. Tanger Med Port Authority, Port of Seattle, and Port Klang Authority participated, including observers from Port of Los Angeles, Hamburg Port Authority, and Port of Gothenburg.

1



2



3



From left:
 1. MPA's Maritime Data and Cyber Security Department participating in EX Cyber Star 2023.

2. MPA's Maritime Data and Cyber Security Department participating in Critical Infrastructure Defence Exercise (CIDEX) 2023.

3. MPA's Maritime Data and Cyber Security Department participating in Port Authorities Chief Information Cybersecurity Network (PACC-Net) TTX during the Singapore Maritime Week 2023.

Making Headway in Maritime Digitalisation and Innovation

Digitalisation for MPA

Customer Relationship Management (“CRM”) System – “BizEngage”

In December 2023, MPA saw the launch of a new CRM system, BizEngage, that runs on Salesforce. The CRM system will transform the way divisions conduct industry engagement and events – from improving the end-to-end experience of officers, to serving as a one-stop repository of engagement data useful for planning and strategy purposes. With the use of the agile-scrum methodology, the CRM system will continue to develop new capabilities in tandem with the growing needs of the organisation.

DREAM Infrastructure Transformation Project

Under its Datacentre Resiliency Enhancement, Approach-to-Modernisation (DREAM) project, MPA has modernised its legacy IT infrastructure to a hyperconverged infrastructure platform capable of pooling and allocating infrastructure resources dynamically to improve server capacity and performance, and redeveloped core port, marine and shipping application systems onto a cloud-native technology. This upgrade enables us to swiftly adapt to the rapidly evolving digital technology landscape. In a collaborative effort to minimise operational disruption, the project involved comprehensive end-to-end migration with participation from multiple MPA teams and our vendor.

Key outcomes of this transformation include enhanced customer experience, increased service availability, and improved service resiliency. The project also ensures MPA’s technology investments are future-proof, compatible with modern cloud technologies and solutions, and reinforces cybersecurity through advanced architecture and updated software and hardware components.

MPA’s Project and Contract Management System (PCMS)

MPA is developing an integrated platform that facilitates seamless interaction between project and contract management processes. The PCMS will interface with existing MPA’s systems (e-Procurement, e-Cabinet, and Workday). It will offer automated control measures to address potential risks throughout project and contract stages.

PCMS will provide a single source of truth, offering a comprehensive and 360-degree view of projects and contract details. All key project and contract information will reside within

PCMS, providing users access to accurate and up-to-date information in a single system. In addition, PCMS will streamline and automate some of the existing workflows in MPA to achieve cost and time savings, along with other intangible benefits.

PCMS will be developed in two phases. Phase 1 comprises the project management module and integration with Workday which will commence in March 2024 and complete in February 2025. Phase 2 comprises the contract management module and integration with existing MPA systems which will complete in October 2025.

Going Digital: Onboarded eGuarantee@Gov

In line with the Digital Government Blueprint’s vision of being “Digital to the Core,” MPA onboarded eGuarantee@Gov. Jointly launched by the Ministry of Finance and the Monetary Authority of Singapore (MAS) in October 2023, eGuarantee@Gov digitalises the process for businesses to provide a banker’s guarantee or insurance bond to government agencies within a day, compared with 5-7 days previously.

Deployed Robotic Process Automation (RPA) for Procurement and Finance Processes

MPA successfully launched an enterprise RPA tool to eliminate manual processes, and has implemented RPA in several areas such as automatic downloading of documents from GeBIZ and automatic email reminder on outstanding e-invoices.



The DREAM Project team at the first cut-over from legacy infrastructure to hyperconverged infrastructure.



The PCMS project team consisting of officers from the Engineering & Project Management Division and IT Division.

Making Headway in Maritime Digitalisation and Innovation

Improved Process Efficacy and Facilitated Faster Payments to Vendors

To better support Government vendors, MPA undertook a review of the Procure-to-Pay process to identify potential improvement areas to achieve better productivity and support the industry with faster payment. Other initiatives included issuance of Workday purchase orders for procurement contracts to tap on Workday's streamlined processes for prompt processing and approval of invoices.

Driving Maritime Innovation

Our MarineTech ecosystem is becoming a more closely knit community of venture capitalists, corporate venture capitalists, and start-ups. PIER71™ start-ups raised more than S\$68 million in the past few years and have attracted more than 116 start-ups that champion new digital and decarbonisation solutions from around the world. PIER71™ startups like BeeX, Groundup.ai, eyeGauge, Phasio, and SungreenH2 are some of the successful startups that managed to raise funds in 2023.

Innovation plays a critical role in accelerating the digitalisation and decarbonisation of the maritime industry. Developments in areas such as additive manufacturing, provide new opportunities for growth. For example, Pelagus 3D, a joint venture by ThyssenKrupp and Wilhelmsen will offer spare parts for the maritime industry worldwide via a digital platform, strengthening the resilience and flexibility of global supply chains.

2023 marks the 5th anniversary of PIER71™. In 2023, the MPA-NUS collaboration also saw an expansion of the PIER71™ initiative beyond Smart Port Challenge 2023 (SPC2023) to connect shortlisted start-ups to overseas markets, government stakeholders, and prospective maritime customers through the PIER71™ Ascend 12-month programme.

PIER71™ Smart Port Challenge 2023: 13 Statements, 17 Finalists Emphasising Digitalisation and Decarbonisation

For the SPC2023, 13 challenge statements were identified, covering maritime decarbonisation, port productivity, voyage optimisation, and cyber resilience. Out of 150 applications from 30 countries, 17 finalists were shortlisted, with nearly 50 per cent of the submissions related to maritime digitalisation and 40 per cent focused on maritime decarbonisation. Solutions include support for clean fuels operations, carbon-value chain, electrification, and green maritime supply chain, highlighting the industry's increasing attention and urgency to accelerate the green energy transition.

From the 17 selected start-ups, the top nine were chosen to pitch. SPC2023 concluded with a strong focus on green technology, showcasing solutions and technologies impacting maritime, particularly alternative fuels and decarbonisation technologies.

Following an evaluation by a panel of judges of their proposed system, business model, market potential, impact to the maritime

industry and overall team capabilities, the winners are:




1st place - Measure.AI

MeasureAI makes novel, low-cost, reusable and highly sensitive real-time gas sensors. They use a patented a novel method of making various unique of gas sensors for ammonia and other gases, addressing safety concerns for bunkering of alternative fuels.




2nd place - CRecTech

CRecTech developed a novel catalyst coating for sustainable biogas reforming that greatly enhances the production of methanol.




3rd place - Rux Energy

Rux Energy is an Australian advanced materials startup aiming to double the volumetric efficiency and halve the cost of dispatchable hydrogen storage for bulk distribution, refuelling, heavy mobility and aviation through their Metal Oxide Framework. Their goal is to be directly responsible for 50 million tonnes of CO2 abatement, each year, every year, by 2030.

SPC2023 also saw 30 of PIER71™'s alumni showcasing their MarineTech solutions.


PIER71™'s 5th Anniversary

PIER71™ celebrated its 5th year anniversary on 21 November 2023 through the PIER71™ Great Circle 2023, which was attended by over 360 people from the maritime community. Since its inception in 2018, PIER71™ has nurtured 110 MarineTech startups through the support of over 80 corporate, investment, and ecosystem partners.

One startup that has grown and internationalised is Moaah. Moaah provides a compliance screening software for cross-border export and transport for Harmonised System (HS) products and commodities. With over 300 mil+ datapoints, Moaah can detect mis-declared and dangerous goods using its proprietary database of products' chemical composition and global trade data for HS products. Using direct government data, Moaah matches cargo content to customs regulations, including import restrictions, duties and tariffs.

Their single database to access all trade related regulations and data to provide intelligence for cross border export, import and transport of goods is gaining traction around the world.

Headquartered in Singapore, Moaah has customers from over 30 countries, supported by teams in Singapore, Indonesia, Lithuania, France, Pakistan, India and South Korea.



Start-ups can look forward to the "The WAVES" at Marina South, an integrated maritime and lifestyle development that will house research institutes and start-ups. [Click here to read more about it.](#)

Making Headway in Maritime Digitalisation and Innovation

Partnerships

Sharing GeoSpace-Sea Public Data for Innovation

GeoSpace-Sea began sharing public data in August 2022, extending it in 2023 to include the Special Purpose Chart. Currently, over 30 datasets, including water depth and natural features, have been released. The primary goal is to promote innovation and encourage the development of applications that utilise GeoSpace-Sea datasets to address future challenges.

IHO-SG Lab Hosts S-57 to S-101 ENC Conversion Workshop

In November 2023, the IHO-Singapore Innovation and Technology Laboratory (IHO-SG Lab) led a workshop on S-57 to S-101 Electronic Navigational Chart (ENC) Conversion in Singapore. Over 20 professionals from 20 IHO member States gathered to enhance their skills in converting to the new S-101 ENC standards, approved by the IMO for implementation on 1 January 2026. The collaborative effort with industry partners aims to advance maritime navigation, and equip participants to share their experiences with their home countries' hydrographic offices.

MPA-PSA Partnership: MoU on Port Technology Research and Development Programme

MPA and PSA Singapore reaffirm a 12-year partnership, committing S\$12 million each to support transformative research in automation, robotics, digital solutions, and sustainability for port operations.

Priorities include testing robotic container handling solutions, smart grid and energy storage systems, and exploring maritime drone use for remote ship inspections and optimising ship-to-shore deliveries.

Wärtsilä-MPA MoU: Accelerating Maritime Decarbonisation and Digitalisation

Under the MoU, MPA and Wärtsilä will explore renewable fuel technologies, establish partnerships for green fuel safety concepts, and work towards developing global standards for maritime fuel safety.

The parties will also look to enhance port operations efficiency through developing secure data exchanges and collaborate on assessing cyber threats to shipboard systems, ship-shore system communications, and MPA's digital platforms. Additionally, they will explore collaborations with stakeholders to identify new skills for the future maritime workforce in digitalisation and decarbonisation.



Participants attending the IHO-Singapore Innovation and Technology Laboratory workshop, led by Dr. Parry Oei, Advisor (Hydrographic Division).

CHAPTER 6

Building a Future-Ready Maritime Workforce

In the dynamic maritime industry, where innovation and adaptability are essential, developing a skilled and knowledgeable workforce is critical. MPA is dedicated to developing a multi-skilled maritime workforce that is adaptable and resilient. From scholarships and global internships, to fostering international partnerships, each of these initiatives are aimed at strengthening the capabilities within Singapore and the global maritime sector. These efforts reflect a focused approach to support the professional growth and readiness of individuals in the maritime field, including in the growth areas of decarbonisation, digitalisation – including artificial intelligence and cybersecurity – as well as automation.



Building a Future-Ready Maritime Workforce

Scholarships and Awards: Pioneering Maritime Excellence

MPA, in partnership with businesses, tertiary institutions and other maritime-related organisations, offer several initiatives that not only help interested individuals kickstart a career in the maritime industry, but also help those already employed in this sector to keep their skills relevant.

These include the MaritimeONE Scholarship and Tripartite Maritime Scholarship (TMSS) for those seeking or pursuing a tertiary education in maritime, the MPA Global Internship Award (MPA GIA) for top undergraduates hoping to gain valuable maritime experience and global exposure, as well as the newly-launched MaritimeONE-Singapore Maritime Institute (SMI) Postgraduate Research & Development (R&D) Scholarship for those pursuing PhD and Master's programmes focusing on cutting-edge technologies.

Nurturing the Next Generation

A record 60 MaritimeONE Scholarships and seven TMSS, sponsored by 34 partners from industry, foundations, and unions, were presented at the MaritimeONE and TMSS Award Ceremony 2023. Then Acting Minister for Transport Mr. Chee Hong Tat was the Guest-of-Honour.

Besides maritime-related courses, the MaritimeONE Scholarships were also awarded to students enrolled in engineering, computer science, data science and artificial intelligence, business and law. A significant number of students enrolled in maritime studies also embarked on additional majors in sustainability and data analytics, reflecting the multi-disciplinary nature of maritime careers and the new skillsets needed to help accelerate transformation in the global maritime sector, especially in the areas of digitalisation and decarbonisation.

Nurturing the Maritime Researchers

Announced at the Singapore Maritime Week 2023, the SMI-MaritimeONE Postgraduate R&D Scholarship aims to develop quality local maritime research talent and domain experts to deepen Singapore's specialised R&D capabilities as a global maritime knowledge hub.

The scholarship focuses on areas such as maritime decarbonisation, simulation for maritime applications, autonomous operations, and cybersecurity.

Gaining Valuable Global Internship Exposure

Established in 2013, the MPA GIA has helped over 340 undergraduates gain valuable on-the-job experience and global exposure at reputable international maritime companies, as well as mentorship opportunities with industry practitioners. MPA will extend the GIA programme for another six years from 2024 to 2029.

MPA welcomed 39 participants to the GIA in 2023, including a first-time intake from the Singapore Institute of Technology. These students, through their engagements with leading maritime firms like Wallem Ship Management and Pacific Carriers, will gain valuable opportunities to work in an international setting, develop their cultural competency, apply their academic learning in real-world industry and have access to a breadth of professional networking opportunities.



Recipients of the 2023 MaritimeONE and TMSS Scholarships at the MaritimeONE and TMSS Award Ceremony on 28 October 2023.



Building a Future-Ready Maritime Workforce

MPA-Led Initiatives: Shaping Global Maritime Leaders

The Maritime Leadership Programme

The Maritime Leadership Programme (MLP) concluded its third iteration on 3 November 2023 which saw 20 leaders from 17 maritime companies from various subsectors, such as ship owners and operators, ship managers, port operators and classification societies, coming together to network, learn and share knowledge and ideas.



A group photo taken during a visit to Copenhagen, Denmark.

Conducted by the Singapore Management University (SMU), the MLP is a ten-day learning journey specially curated for senior management leaders within maritime, to groom a pipeline of future local leaders. As part of the programme, students will have opportunities to interact and engage directly with key industry players to tap their insights and views.



The third batch of Maritime Leadership Programme participants with MPA's Chief Executive, Mr. Teo Eng Dih.

Advancing Maritime Leadership Skills with MPA Academy (MPAA) Flagship Programmes

In April 2023, during Singapore Maritime Week, MPAA and SMU co-hosted the 5th Advanced Maritime Leaders' Programme (AMLP), MPAA's premier offering for top-tier maritime officials. This edition welcomed

24 leaders from 16 countries, focusing on enhancing leadership capabilities and organisational transformation in the complex maritime landscape. Participants explored strategic management, policymaking, and crisis communication, with innovative sessions like orchestra role-playing and media training.

Additionally, MPAA organised the 13th Maritime Public Leaders' Programme and the 9th Port Management Programme in 2023.

Supporting Seafaring Careers through Sail Milestone Achievement Programme (SailMAP)

The SailMAP, initiated in June 2022 with a S\$12.5 million fund from MPA and tripartite partners, reaffirms Singapore's commitment to develop seafaring as a rewarding career. SailMAP offers up to S\$50,000 to each seafarer upon reaching key career milestones, including a S\$10,000 sign-on bonus when they sign on their first vessel as a Certificate of Competency (COC) Class 3 (deck officer) or 5 (marine engineer) holders.

Since its inception, almost 100 seafarers have advanced in their careers through SailMAP, with total disbursements amounting to more than S\$600,000.



A SailMAP Award recipient receiving their certificate from Mr. Michael Phoon, Executive Director, Singapore Shipping Association, at the Singapore Registry of Ships (SRS) Forum on 23 October 2023.

SailMAP provides each eligible local seafarer up to S\$50,000 when they attain key milestones in their seafaring training.

<p>1</p> <p>Take Certificate of Competency (COC) Class 3 (deck officer) or Class 5 (marine engineer) Exam before National Service (NS).</p> <p>First Attempt Exam Fee Waive</p> <p>Re-joining bonus when COC 3/5 holders sign on to their first vessel post-NS.</p> <p>S\$10,000</p>	<p>2</p> <p>After 12 months of sea time and obtaining eligibility letter to join COC 2/1 prep course.</p> <p>S\$10,000</p> <p>Monthly allowance (for 6 months) while undergoing COC 2/1 prep course.</p> <p>S\$6,000</p>
<p>3</p> <p>Bonus for attaining COC 2.</p> <p>S\$4,000</p> <p>Bonus for seafarers who return to sea after attaining COC 2.</p> <p>S\$5,000</p>	<p>4</p> <p>After 12/24 months of sea time to be eligible for COC 1 examination.</p> <p>S\$10,000</p> <p>Bonus after attaining COC 1.</p> <p>S\$5,000</p>

[Click here to read about the redevelopment of Maritime House, which provides exclusive, affordable accommodation for seafarers.](#)

Building a Future-Ready Maritime Workforce

Strategic Partnerships: Expanding Horizons

Strengthening Surveyor Expertise through American Bureau of Shipping (ABS) Partnership

A new training agreement with ABS, focusing on enhancing the capabilities of MPA surveyors, aims to provide comprehensive training on the latest maritime technologies, including remote survey techniques, methanol-fuelled vessels, and gas carrier inspections.

The initiative extends beyond traditional surveying, offering MPA trainees hands-on experience in ABS' remote surveys and audits, and exposure to cutting-edge technologies such as energy-efficient batteries and alternative fuels like methanol and ammonia. The programme emphasises practical, on-the-job training in advanced simulation and modelling techniques, crucial for assessing ship performance and environmental impact.

This partnership fosters a mutual exchange of knowledge and expertise between MPA and ABS surveyors, significantly enriching their professional skills and contributing to maritime safety and efficiency.

Enhancing Maritime Cooperation with Indonesia: Collaborative Framework for Maritime Safety

On 25 October 2023, MPA and the Directorate General of Sea Transportation of Indonesia (DGST) cemented their commitment to maritime safety and efficiency by signing a Memorandum of Cooperation (MoC). This agreement aims to bolster the exchange of vital information and foster stronger cooperation and collaboration between the two regulatory bodies.

A key aspect of the MoC is the development of joint training and exchange programmes for Port State Control (PSC) and Flag State Control (FSC) officers, facilitating shared learning and best practices. This collaborative effort is expected to enhance the regulatory oversight and operational excellence of both maritime authorities, reinforcing safety and environmental protection in the region's bustling maritime corridors.

Furthermore, the MoC serves as a catalyst for greater harmonisation of regulatory standards and procedures within the region's maritime corridors. By aligning their approaches to safety and environmental protection, MPA and DGST seek to enhance compliance and promote a level playing field for all stakeholders involved in maritime operations. Through joint initiatives and collaborative efforts, the two authorities aim to uphold the highest standards of safety, security, and environmental stewardship, ensuring the sustainable development of the maritime industry for generations to come.



Mr. Raymond Lee, Senior Marine Surveyor (Flag State Control), undergoing marine surveyor training with the American Bureau of Shipping.

Building a Future-Ready Maritime Workforce

Promoting Maritime Careers

Empowering Maritime Careers with “Sea the Difference”

MPA launched the “Sea the Difference” marketing campaign on 24 November 2023 to highlight the diverse career opportunities in the maritime sector. Anchored by a short film series, and supported by online engagement efforts, the campaign also aimed to debunk common myths about maritime jobs, as well as profile interesting but lesser-known careers, such as a hydrographic surveyor and a vessel traffic officer.

The short-film series titled ‘The Matchmaker’ was inspired by real-life maritime professionals who have successfully embarked on shore-based maritime careers even though they did not have the relevant background.

[Click here to learn more about the Sea the Difference campaign!](#)

Watch the individual series:

- [▶ ‘The Matchmaker’](#)
- [▶ ‘Shore or Not’](#)
- [▶ ‘Make a Splash’](#)



From top:
1. ‘The Matchmaker’ short film series was inspired by real-life maritime professionals who embarked on shore-based maritime careers, despite having no prior background.

2-3. The ‘Make a Splash’ and ‘Shore or Not’ social media series featured Mediacorp personality Joakim Gomez trying out interesting maritime roles, and debunking misconceptions about the maritime industry.

Connecting Talent Across Singapore: SGUnited Jobs & Skills Info Kiosks

In partnership with Workforce Singapore (WSG), MPA participated in the SGUnited Jobs & Skills Info Kiosks to engage the public on the interesting and impactful work of our MPA officers and the broader career opportunities in the maritime sector.



Several runs of the public engagement were conducted between April and December 2023, and included venues such as Bishan Junction 8, Bukit Panjang, Funan, Sengkang Grand Mall, and Suntec City.

Charting Maritime Careers: Interactive Learning at SkillsFuture Festival 2023

MPA partnered with SkillsFuture Singapore for the SkillsFuture Festival 2023. The event featured learning journeys to key maritime locations, including the Port Operations Control Centre, Integrated Simulation Centre, Maritime Drone Estate, and Singapore Maritime Gallery, offering insights into the diverse onshore and offshore career opportunities. Participants also had the chance to engage directly with MPA and industry professionals through the “Ask-Me-Anything” sessions organised as part of the learning journeys.



From top:
MPA officers sharing with members of public about maritime careers at the SGUnited Jobs & Skills Info Kiosks.

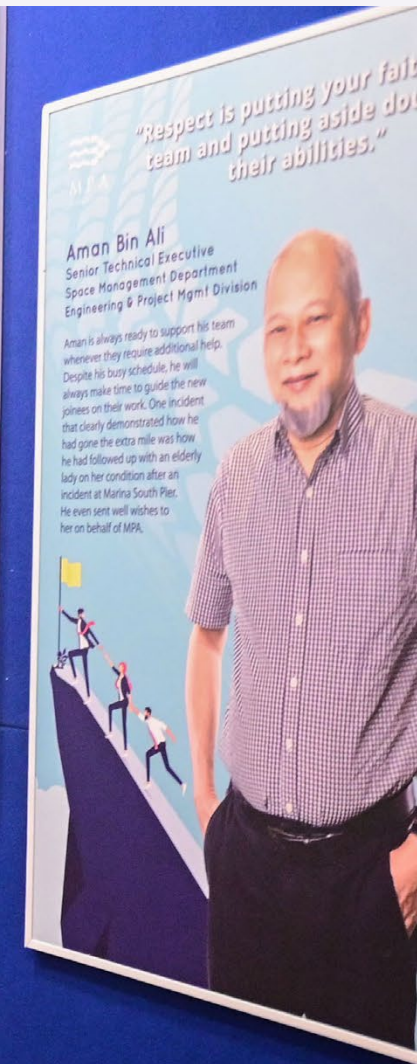
Participants attending a learning journey to Singapore Maritime Gallery during the SkillsFuture Festival 2023.

CHAPTER 7

Fostering Organisational Excellence

MPA champions the values of Forward Thinking, Integrity, Respect, Service Excellence, and Teamwork – or FIRST in short – to develop our people to their fullest potential. These values include working together to maintain sound financial and governance policies, finding innovative solutions to streamline processes, and upholding organisational excellence.

In 2023, MPA conducted various initiatives to enhance employee engagement, professional growth, and foster a positive workplace culture. These events align with our mission to develop a skilled and motivated workforce.



Fostering Organisational Excellence

Promoting a Community-Centric Work Culture

Values Week

MPA's FIRST Values

Forward Thinking

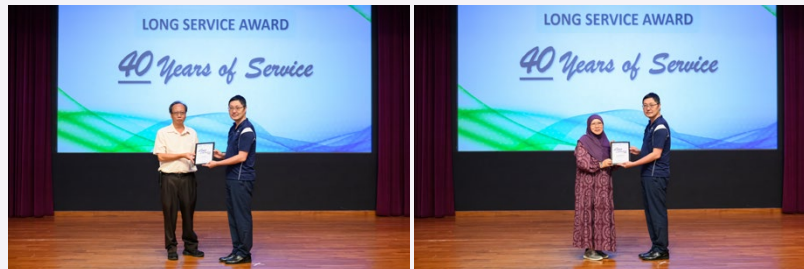
Integrity

Respect

Teamwork

Service Excellence

MPA's Values Week is an annual celebration and reminder for MPA officers of our FIRST Values. Values Week 2023 kicked off MPA's calendar of events for 2023 in January, beginning with lunch cohesion outings, raising funds through a charity flea market for our beneficiaries REACH and MINDS, and culminating with our first Townhall. Staff who had exemplified FIRST Values were awarded the FIRST Award at the Townhall.



MPA officers received their Long Service Awards at the 24 August 2023 Townhall

Townhalls

MPA conducts Townhalls to keep MPA officers updated on maritime developments, Human Resource matters, MPA CARES events, as well as foster dialogue between staff, the Chief Executive, and the senior leadership team.

In 2023, two Townhalls were held:

2023

19 January



MPA Senior Management engaging MPA officers during the 19 January 2023 Townhall.

“Achieving more together”

Recognising FIRST Awards winners, and featuring a digitalisation update from the Chief Information Officer (CIO).

24 August



MPA's Chief Executive, Mr. Teo Eng Dih, giving his address at the 24 August 2023 Townhall.

“Building capabilities for our collective future”

Honouring Long Service Award recipients and MPA's Environment, Health, and Safety (EHS) Committee, along with presentations by Division Directors on departmental transformation efforts.



FIRST Award and Champions

The MPA FIRST Award seeks to motivate all MPA officers towards upholding MPA's FIRST Values in their everyday roles. In 2023, 27 officers were accorded MPA's FIRST Award.

FIRST Champions

Qamaruzzaman Bin Zainudin
Noor Asiah Bte Nordin
Teo Beng Geok

When they noticed that their colleague had been uncontactable for two days, Beng Geok, Asiah and Qamar took the initiative to visit her house, and found her lying on the floor after suffering from a stroke. They immediately called for an ambulance. For going beyond their call of duty, the three officers were accorded special acknowledgement as MPA's Overall FIRST Champions.



Mr. Qamaruzzaman Bin Zainudin, Senior Driver (Procurement & Admin), and his two colleagues were recognised as MPA's Overall FIRST Champions.

Fostering Organisational Excellence

Appointment of new Environment, Health and Safety (EHS) Committee

Members of the new EHS Committee received their letters of appointment from MPA's Chief Executive Mr. Teo Eng Dih at the MPA Townhall held on 24 August 2023.

The new committee will take the lead to strengthen MPA's safety framework, raise awareness of safety in the workplace, and promote a strong EHS culture.



The new EHS Committee with MPA's Chief Executive Mr. Teo Eng Dih at the 24 August 2023 Townhall.

Maintaining Strong Ethics and Promoting Risk Awareness

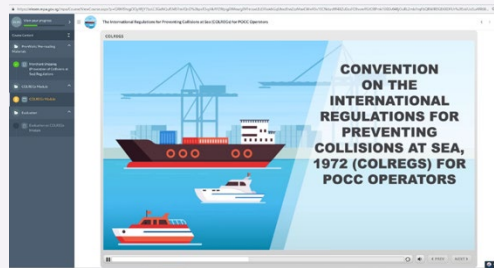
The Internal Audit Division (IAD) of MPA plays a key role in maintaining strong ethics and promoting a culture of risk awareness within the organisation. They manage a whistleblowing channel for MPA officers and members of the public to report suspected fraudulent activities, improper conduct, or wrongful acts without fear of retaliation. There were no reports of fraud or corruption in the past year.

Additionally, IAD publishes the Risk Digest, an internal staff publication aimed at promoting risk awareness and enhancing MPA's risk culture. To further their outreach, IAD conducts sharing sessions at staff briefings that cover various audit and risk-related topics, such as building and strengthening controls, publicised cases of fraud or corruption, and learning points from significant audit findings at other public agencies.

Empowering Innovation and Continuous Learning

Recognising the dynamic nature of the maritime industry, MPA places a high emphasis on continuous learning and innovation.

A key initiative launched in 2023 was the Learning Transformation initiative, which helps convert traditional classroom learning into e-learning for officers from the Vessel Traffic Management and Marine Environment and Safety departments. By leveraging digital platforms, the initiative provides learners with increased flexibility and accessibility to the training materials, enhance employees' learning experiences, and facilitate continuous skills development.



MPA's e-learning platform encourages MPA officers to continually upgrade their skills.

4th Round of COG Public Service Transformation (PST) Meeting with MOT-Family

In September 2023, MPA represented the Ministry of Transport (MOT) to host the 4th Centre-of-Government (COG) Public Sector Transformation (PST) meetings – a key platform for Ministry Families to engage in dialogue with COG on key PST-related issues. The event was held at MPA's Singapore Maritime Gallery.

Fostering Organisational Excellence

MPA's Innovation Challenge

The Innovation Challenge 2023 was launched to advance workplace digitalisation, encouraging Divisions within MPA to streamline their regular operations and enhance skills. The programme emphasised the importance of re-engineering work processes before implementing digital solutions.

Over six months, six workshops were held, covering topics such as Building a Project Charter creation, Developing an As-Is Process Map with Value Analysis, Generating a To-Be Process Map and Ideation, Prototyping, Proof of Concept and Piloting, and Change Management. These workshops guided Divisions through a structured approach to



Innovation Challenge 2023 teams brainstorming solutions to workplace challenges.

transition from their existing processes to be more efficient, technology-driven, aiming for increased resilience and the ability to achieve more with fewer resources. By the end of Innovation Challenge 2023, three project teams had come up with re-engineered processes in the areas of staff onboarding, equipment maintenance, and management of MPA's grants and incentives, to be further explored for implementation.

myMPA Portal

The myMPA Portal is central to MPA's digitalisation strategy for corporate services, enhancing the digital workplace experience. It serves as a comprehensive self-service platform for employee services and the main channel for internal communications, keeping staff informed about MPA activities



The portal also fosters a digital community space by keeping staff connected. The second phase of myMPA Portal was successfully launched on 29 March 2023, where procurement and admin processes were digitalised and overall user experience for employee services was improved. To date, 66 service catalogues have been digitalised across two phases, with over 1,000 knowledge articles developed to document and disseminate policies and expertise.

Launch of new near-miss reporting on myMPA app

In March 2023, the myMPA app introduced a near-miss reporting feature, empowering MPA officers to actively contribute to personal and coworker safety. This feature simplifies the process of reporting incidents with easy upload of photo evidence and detailed information, facilitating prompt department action to mitigate hazards and prevent serious accidents.

Reorganising MPA to Drive Sustainability

A new division, the Maritime Decarbonisation Division, has been set up to ramp up MPA's efforts to drive maritime decarbonisation. The division's work will be coordinated by the Chief Sustainability Officer and the Assistant Chief Executive (Operations), directly reporting to the Chief Executive.

MPA also continues to build a sustainability culture within the organisation – through various communications, events, and training – with the intent of deepening eco mindsets and habits in our staff and give back to the community.

In addition, MPA has formed a workgroup to monitor our environmental, social and corporate indicators. MPA will be reporting these indicators in our Sustainability Report 2023, which will be published in 2024. The Sustainability Report will be prepared based on the GreenGov.SG requirements and the

updated Global Reporting Initiative (GRI) 2021 standards. The report will also incorporate relevant disclosures from several key global standards, including the IMO in alignment with United Nations Sustainable Development Goals (UN SDGs), Marine Transportation Standard under the Sustainability Accounting Standards Board (SASB), and the World Port Sustainability Programme (WPSP).

The biennial Public Service Employee Engagement Survey (EES) 2023, conducted in the month of October 2023, indicated that MPA performed well on Corporate Social Responsibility (CSR), Sustainability and Workplace Safety and Health (WSH). In general, we obtained more than 80 per cent favourable responses in these domains – indicating that MPA officers recognise the organisation as one that is socially responsible, in both charitable and environmental aspects, as well as committed to employee safety.

Fostering Organisational Excellence

Promoting MPA as a Choice Employer

To future-proof its workforce, MPA has launched programmes in sustainability, digital, and data fields to enhance officers' careers. MPA also established competency frameworks that enabled officers to gain niche certifications in their technical domains.

More than 70 per cent of MPA officers responded favourably to MPA's efforts in developing SkillsFuture-readiness. Specifically, officers indicated that they could identify and possess competencies to stay employable and relevant in the Public Service.

Training and Learning for MPA Staff

In 2023, over 700 officers attended more than 100 courses organised by the MPA Academy (MPAA). These courses covered technical training for specialists in the Ops and Ops-Tech Clusters, including Vessel Traffic Operators/Supervisors, Marine Officers, and Engineers.

Additionally, MPAA organised cross-divisional courses on maritime decarbonisation and



MPA officers attending the MPA Sustainability Course (Level 1) conducted by Prof. Ho Hiang Kwee on 19 December 2023.

sustainability, as well as training in methanol firefighting in preparation for future bunkering operations.

MPA staff also participated in sessions on the current geopolitical situation and preventing corrupt practices. Notably, an inaugural MPA sustainability course was conducted to establish a strong foundation for understanding climate change, covering topics such as global warming trends, climate science, and Singapore's climate change policies.

Lunch-and-Learn sessions, covering topics such as ChatGPT for Public Officers and Robotic Process Automation, were also conducted.

MPA also partnered with the American Bureau of Shipping to establish a Surveyor Attachment Programme, providing surveyors with cutting-edge training in remote surveys and advanced shipping technologies during attachments in Houston and Korea.

Supporting Career Growth with Sponsorship and Job Rotations

MPA's In-Service Sponsorship programme was also revamped to support officers in acquiring skills in new areas. This initiative has facilitated several job switches within MPA, such as moving from Human Resources to developing licensing and manpower policies for the harbour craft sector, or from crisis management roles to cybersecurity.

Nurturing Young Talents

Beyond growing the career of our officers, MPA also recognises the importance of nurturing the next generation of young talents. Besides actively engaging students at various Institutes of Higher Learning (IHLs) through career talks and recruitment fairs, an inaugural collaboration was sought with the Ministry of Education (MOE) to offer the MOE Engineering & Technology Programme Scholarship to two Junior College students, enabling them to complete an internship with MPA.

Through the enhanced outreach, MPA engaged three times the number of interns in 2023, compared to the preceding year.

Re-organisation and Career Coaching Initiatives

The appointment of the Chief Transformation, Information Security, and Digital Officers, were created in 2023. MPA also supported staff growth with the appointment of certified Career Coaches and the Career Development Committee for ongoing career and talent discussions.

Physical and Mental Well-Being Initiatives

MPA prioritises the health and wellness of our staff. For officers who have attained two years of service, MPA offers them a personal development fund to pick up activities, such as fitness classes or personal hobbies.

Support extends to officers' families too, with bursary awards and book prizes for their children's educational achievements, alongside a Back-to-School time-off during the school year's first week.

Annual health checks and flu shots are also fully funded, with additional health screening options at corporate rates for staff and their families, as well as ART kits provided to maintain vigilance during the COVID-19 pandemic.

In 2023, MPA introduced Wellness Ambassadors to offer basic mental and emotional support. Appreciation Tokens were awarded to officers for their contributions to COVID-19 efforts between February 2020 and February 2023. Various welfare activities, including succulent potting, art jamming, cardio kickboxing, terrarium-making, batik painting, and resin coaster-making workshops, were held throughout the year.

Staff Engagement

More than 10 staff engagement sessions with MPA's Chief Executive and Senior Management were held in 2023. MPA's Senior Management also visited officers onboard vessels to learn and observe their operational challenges and responsibilities firsthand. They also visited our Port Operations Control Centre on Chinese New Year, Hari Raya and Deepavali, to appreciate and recognise our officers who work tirelessly round the clock.

Fostering Organisational Excellence

Championing Environmental Stewardship in Community Engagements

Committing to environmental stewardship

MPA supported two key events – the Singapore Regatta 2023 Coastal Clean-up at Pasir Ris Park on 12 August 2023, and Paddle for a Purpose 2023 at Pasir Ris Beach on 2 December 2023, organised by the Singapore Sailing Federation and Ocean Purpose Project respectively. These events were part of MPA's efforts to create greater awareness among staff on how we can contribute towards preserving our planet for future generations and support for groups doing the same.



MPA officers and our community partners at Paddle for a Purpose 2023 organised by Ocean Purpose Project at Pasir Ris Beach on 2 December 2023.

MaritimeSG Youth Ambassadors (MYA)

The second batch of 21 MYAs was appointed on 8 August 2023 for a 2-year term.

The MYA programme is opened to students from local IHLs to provide youth leaders a platform to champion a maritime movement among their peers and create greater awareness of the maritime industry through peer advocacy.



The second batch of 21 MaritimeSG Youth Ambassadors was appointed on 8 August 2023.



MYA Elaine Lim, an NTU Maritime Studies undergraduate, and an intern at MPA, conducting a workshop at the World X @ ITE 2023 event in August 2023.



MYA Orchid Safura, a Cadet Trainee Officer, participated as a panellist during the Nautical Institute Singapore Conference 2023 in October 2023.

Around 120 volunteers picked up a total of 16kg of litter during the Singapore Regatta 2023 Coastal Clean-up. Watch this video to find out what some of those items were.

Fostering Organisational Excellence

Revitalising Maritime Heritage with Singapore Maritime Gallery (SMG) Reopening

The SMG reopened on 25 April 2023 after a seven-month renovation, marking its second update since its 2012 inauguration. Coinciding with Singapore Maritime Week 2023, the revamped gallery showcases the maritime sector's evolution with a focus on innovation, digitalisation, and decarbonisation.

As a hub for events and programmes, it drew over 21,000 visitors in 2023. The SMG, designed as a collaborative space, also features collaboration with groups like Coastal Natives, an ocean advocacy community, to showcase its award-winning augmented reality artworks under ART for the Ocean during World Oceans Day 2023. MPA also partnered the National Library Board to develop the SMG children section, which has integrated, downloadable maritime-theme e-books within the engagement spaces.

In addition, MPA is expanding its network of programme partners for SMG and has held numerous workshop and events in 2023, such as a comic art workshop with local artists, Voyage of Discovery talks, and public storytelling sessions.



Visitors at the revamped Singapore Maritime Gallery.

Boosting Community Engagement and Charity Initiatives

MPA Fund Raising Charity Bazaar 2023 with MINDS & REACH

- ▶ Rallied over 25 volunteers
- ▶ Successfully raised S\$6,675, which was disbursed to both charities
- ▶ Sale of Chinese New Year Goodies & crochet bouquets and dolls
- ▶ Booths by MINDS and REACH to share about programmes & activities in supporting their beneficiaries

Sponsored REACH's Wall Mural

- ▶ Involved around 15 MPA volunteers
- ▶ Painted wall murals at REACH's new welfare service centre at Teck Whye Vista
- ▶ MPA volunteers worked alongside REACH's seniors to paint and set up the new centre

Ministry of Transport (MOT) Family Charity Outreach 2023

- ▶ Organised by MOT, with the Civil Aviation Authority of Singapore (CAAS), the Land Transport Authority (LTA), and the Public Transport Council (PTC), in partnership with Fei Yue Community Services
- ▶ Featured activities to promote planting greeneries and encouraging gracious behaviour in the community

End of Year Fundraising Event with REACH & MINDS

- ▶ Organised Christmas party for beneficiaries of MINDS and REACH



MPA officers participating in the wall mural painting at REACH's Teck Whye Vista welfare service centre.

CHAPTER 8

Recognising Excellence and Achievements

MPA received the following awards and recognitions in 2023, a reflection of the strong support and tripartite co-operation among the unions, industry and government.



Recognising Excellence and Achievements

World's Top Maritime Centre in Xinhua-Baltic ISCD Index for 10th Consecutive Year

Singapore retained its lead as the world's top maritime centre in the Xinhua-Baltic International Shipping Centre Development (ISCD) Index. This is the 10th consecutive year that Singapore has achieved this.

The 2023 Xinhua-Baltic ISCD index, published by the Baltic Exchange and China's Xinhua News Agency, ranked Singapore as the leading maritime centre among 43 global maritime hubs. The index provides an independent ranking of the performance of maritime locations on factors including cargo throughput, port facilities, maritime services and business environment. Singapore's strategic location, international outlook and established ecosystem of professional global maritime services, as well as good governance, have contributed to the growth of our international maritime centre serving the global community.



Mr. Tan Hoe Soon, MPA's Assistant Chief Executive (Corporate & Strategy), receiving the 2023 Asian Freight, Logistics and Supply Chain (AFLAS) Awards.

"Best Global Seaport" and "Best Seaport in Asia" at 2023 AFLAS Awards

The Port of Singapore was named the "Best Global Seaport" for the third consecutive year and the "Best Seaport in Asia" for the 35th time at the 2023 Asian Freight, Logistics and Supply Chain (AFLAS) Awards.

These accolades recognise the contributions by the Port of Singapore serving as a key node in the global supply chain, and Singapore's leadership in driving maritime decarbonisation and transformation. The annual AFLAS Awards is organised by freight and logistics publication, Asia Cargo News, to honour leading service providers in the supply chain community for demonstrating leadership as well as consistency in service quality, innovation, customer relationship management and reliability. Winners were determined by votes cast by readers of the publication.

MPA recognised in Pro-Enterprise Survey Award

MPA was one of three Government agencies that received the Pro-Enterprise Survey Award 2023 at the Ministry of Trade and Industry's (MTI) Pro-Enterprise Panel (PEP)-Singapore Business Federation (SBF) Awards. The award recognises Government agencies that have achieved good results in the biennial Pro-Enterprise Survey. The Award is an acknowledgement of MPA's strong partnership with the industry to address their business needs, as well as working with them to transform their activities.

2022 Project Management Institute (PMI) Engineering and Construction Project of the Year

The Tuas Port Phase 1 (TPPI) Reclamation project – a collaboration between MPA, Surbana Jurong, and DIAP-DAELIM JV – received the top award in Engineering and Construction at PMI Singapore's 8th Project of the Year Awards on 14 March 2023. The accolade celebrates the team's innovative and sustainable management of a large-scale project, marking MPA's first PMI honour and the fourth significant award for the TPPI project. The Tuas Port also reached a milestone of 1 million TEUs just six months after its inauguration.

Established in 1969, PMI is a leading authority in project management, offering globally recognised standards and certifications.

Minister's Innovation Award 2023

The Minister's Innovation Award, initiated in 2002 by the Ministry of Transport (MOT) and its Statutory Boards, honours innovative projects within the sector. In 2023, accolades were presented across various categories, with Singapore's inaugural methanol bunkering for container ships taking the Distinguished Award.

The Merit Award recognised projects, including the DREAM Infrastructure Transformation, AI-enabled UAV turbidity monitoring at Tuas Port, and the integration of the Maritime Drone Estate with 5G

technology. Additionally, efforts such as the myMPA app's near-miss reporting and the revitalisation of the Singapore Maritime Gallery were commended for their innovative contributions.



Mr. Kenneth Lim, MPA's Assistant Chief Executive (Industry & Transformation), receiving the Pro-Enterprise Survey Award from Mr. Gan Kim Yong, Minister for Trade and Industry.



The MPA team behind Singapore's first Ship to Container Ship Methanol Bunkering – consisting of officers from the Operations & Marine Services Division, Operations Transformation & Planning Division, and Shipping Division – receiving the Distinguished Award from Minister for Transport and Second Minister for Finance Mr. Chee Hong Tat.

Recognising Excellence and Achievements

Minister's Innovation Award 2023



Distinguished Award

- Singapore's First Ship to Container Ship Methanol Bunkering

Merit Awards

- Datacentre Resiliency Enhancement, Approach-to-Modernisation (DREAM) Infrastructure Transformation Project
- AI-enabled Multispectral Imaging using UAV for Turbidity Monitoring During Dredging and Reclamation Works at Tuas Port
- Future-Readying our Port Waters with Maritime Drone Estate (MDE) and 5G

Good Attempt

- Near-miss Reporting on myMPA App
- Refresh of Singapore Maritime Gallery to increase outreach, impact and engagement

Recognising Outstanding Talent: Public Sector Transformation (PST) Awards

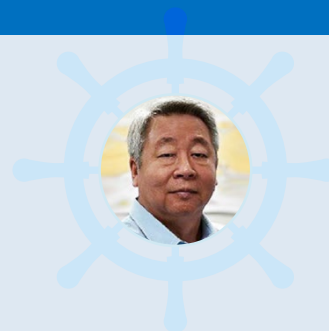
The PST Awards is a Whole-of-Government pinnacle platform to recognise public officers and agencies for outstanding service and practices, promoting excellence and innovation in public service.

MPA's 2023 PST Award recipients



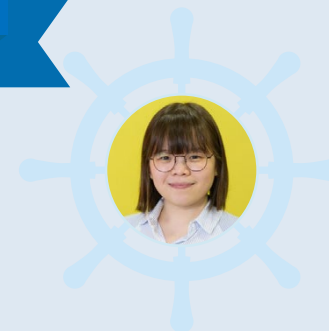
Dare to Do Award - Mr. Putra Mohammad Danish, Manager (IT Division)

Putra achieved significant manpower savings by leading a comprehensive redesign of MPA's processes related to IT and replacing legacy systems. This involved measures such as integrating the approval for IT requests, automating repetitive tasks such as account reviews, and the complete management of IT resources.



Exemplary Innovator Award – Dr. Parry Oei, Advisor (Hydrographic Division)

Parry is active in the International Hydrographic Organization (IHO), United Nations Marine Spatial Data Infrastructures (MSDI) Working Groups, and other international hydrographic bodies, providing his team access to their international networks and resources. He initiated the first global hydrographic laboratory – the IHO-Singapore Innovation and Technology Laboratory – to support R&D gaps identified by IHO member states. With this setup, Parry was able to pull together stakeholders from government and academia for innovation, which has led to many projects initiated and at least three IHO standards established.



Exemplary SkillsFuture @ Public Service Award - Ms. Cheryl Wee, Manager (Finance, Procurement & Admin Division)

Cheryl applied her passion and knowledge in data analytics by initiating and participating in many data analytics projects in MPA. These include analysing the impact on revenue by the addition or removal of concessions and surcharges, past year trends of arrested vessels, visits by diplomatic vessels, and the effectiveness of several MPA concession schemes.

Recognising Excellence and Achievements

Friends of Community Care (FOCC) Award 2023

The FOCC Awards by the Agency for Integrated Care (AIC) honour contributions to the Community Care sector by external partners. Nominations from Community Care partners are assessed by a panel including sector veterans and representatives from the Ministry of Health and AIC. Criteria include impact, commitment, and innovation. MPA received the 2023 FOCC Award in the Government and Public Institution Category for significant support to the sector, presented at the Community Care Work Plan Seminar on 5 June 2023.

ShipTek International Maritime (SIMA) Awards 2023

Since 2008, SIMA annually awards leading contributors to maritime development. In 2023, 20 awards were presented. MPA received the Corporate Social Responsibility (CSR) Award for its environmental initiatives such as Green Ship, Green Port, and Green Energy & Technology Programmes, alongside its accolades in charity and CSR excellence.

Community Chest Awards 2023

MPA received the Community Chest Charity Bronze Award for our donations to Community Chest and the SHARE Gold Award for our participation in SHARE contributions to support the social service agencies and their beneficiaries.

MaritimeSG Care Awards

On 1 March 2023, MPA and 50 maritime organisations were awarded the MaritimeSG Care Award (COVID-19 Resilience) at a ceremony organised by MOT to recognise their significant contributions to maintaining Singapore's maritime operations during the COVID-19 pandemic.

This tripartite partnership among government, industry, and unions ensured the Port of Singapore remained operational 24/7, safeguarding global supply chains and the continuous flow of essential goods, while also prioritising the safety of maritime workers.



Er. Tham Wai Wah, Chief Sustainability Officer, Chief Engineer, Senior Director (Engineering & Project Management) receiving the ShipTek International Maritime 2023 Award.



Top: Mr. Teo Eng Dih, MPA's Chief Executive, receiving the Friends of Community Care 2023 Award from Mr. Ong Ye Kung, Minister for Health.







Award recipients at the MaritimeSG Care Awards 2023 Appreciation Reception.



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