

SRS

# E - BULLETIN

December 2024



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# World's first use of ammonia as a marine fuel in the Port of Singapore

The Maritime and Port Authority of Singapore (MPA), in collaboration with Fortescue and partners from government, industry and research fields, successfully demonstrated the world's first use of ammonia as a marine fuel in the Port of Singapore involving Singapore-flagged dual-fuelled ammonia-powered vessel, FFI Green Pioneer.

## The demonstration involved two sets of trials:

1) The first, which concluded in March 2024, was carried out over seven weeks and involved testing of the vessel's ammonia storage system, associated piping, gas fuel delivery system, retrofitted engines, and overall seaworthiness. The vessel was loaded with 5 cubic metres (3 tonnes) of liquid ammonia from the Vopak Banyan Terminal on Jurong Island, demonstrating the potential for existing infrastructure to support new marine fuels.

2) The second trial was carried out over a 10-day period in April/May 2024, with the vessel utilising 6.4 cubic meters (4.4 tonnes) of liquid ammonia in combination with diesel and Hydrogenated Vegetable Oil (HVO), to facilitate propulsion and maneuverability tests as part of the vessel's sea trials.

Safety was paramount throughout the trials, with extensive measures implemented including Hazard Identification Study and Hazard and Operability Study workshops, emergency response training, and the development of an ammonia plume model to support safety and incident response planning.

Following the successful demonstration, FFI Green Pioneer received flag approval from the Singapore Registry of Ships and the "Gas Fuelled Ammonia" notation from classification society DNV. This official recognition underscores the significance of the achievement and paves the way for future developments in ammonia-fuelled shipping.

The lessons learnt and experiences from the trials were shared with the international community at the International Maritime Organization (IMO) during the 82nd session of the Marine Environment Protection Committee and 108th session of the Maritime Safety Committee, underscoring Singapore's commitment to advancing the shipping industry's decarbonisation efforts at the global level.

## FEATURE STORY

The successful trials demonstrate the possibility for the adoption of ammonia in international shipping, setting the stage for future development of ammonia-fuelled vessels, expansion of ammonia bunkering infrastructure in ports worldwide, and continued research into greenhouse gas emissions reduction technologies.

For more information on the trials, refer to MPA's press releases:

1. World's First Use of Ammonia as a Marine Fuel in a Dual-Fuelled Ammonia-Powered Vessel in the Port of Singapore | Maritime and Port Authority of Singapore
2. Successful Propulsion and Manoeuvrability Trials by Fortescue's Dual-fuelled Ammonia-Powered Vessel in the Port of Singapore | Maritime and Port Authority of Singapore



# Supporting seafarers in the shipping industry's decarbonisation journey

As a global maritime hub and large flag administration, Singapore is committed to ensuring that seafarers' skills remain relevant with the emergence of new and alternative fuels and technologies. To this end, Singapore has an interest in supporting the development of global training requirements, to ensure that seafarers can competently discharge their duties on board future vessels.

To-date, Singapore has gained experiences in the handling and use of alternative fuels such as methanol and ammonia through various bunkering and operation pilot trials. For these, MPA had ensured that the seafarers involved were adequately trained, including undergoing specialised methanol firefighting as well as ammonia safe handling training to ensure that they were familiar with responding to emergency situations. These training courses were co-developed by MPA and partners such as the Singapore Maritime Academy.

In 2024, MPA also launched the Maritime Energy Training Facility (METF) as a decentralized network of training facilities in Singapore, supported by over 50 local and international partners. The objective of the Facility is to upskill the global maritime workforce on the operations, bunkering and management of zero or near-zero emission-powered vessels. It would feature new marine engine simulators for alternate fuels (e.g., methanol, ammonia), an integrated engine/bridge simulator for crew management, and common facilities for fire safety and gas simulant training.



## FEATURE STORY

To build awareness on the METF's offerings, MPA organised two workshops in August and October 2024 involving METF partners and stakeholders to undertake an in-depth exploration of the industry's needs and requirements for alternative fuel training for seafarers and maritime professionals.



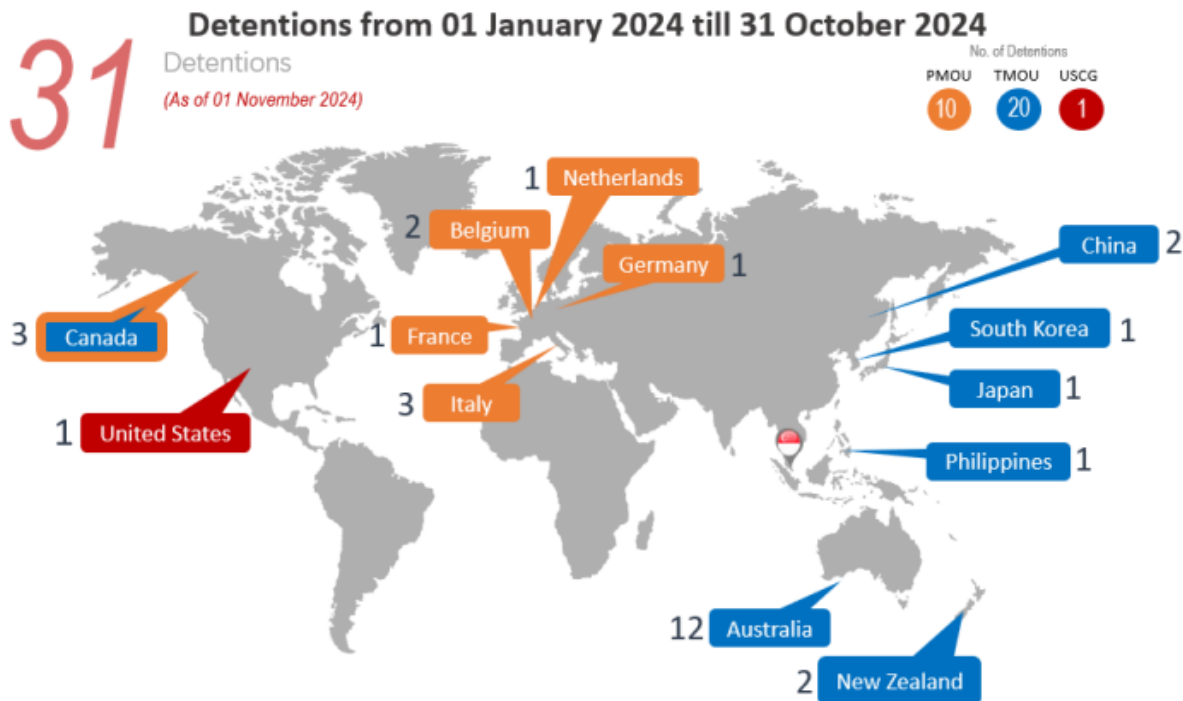
To date, more than 400 personnel have successfully completed training under the METF, including baseline and advanced courses on methanol handling. MPA remains committed to collaborating with METF partners to deliver world-class training programs that support the industry's decarbonization efforts. Furthermore, Singapore has submitted a paper on training guidelines for methanol and ammonia fuel handling to the IMO Sub-Committee on Human Element, Training and Watchkeeping (HTW), which will be discussed at its eleventh session in February 2025.

# Port State Control (PSC) performance of the SRS from 1 January to 31 October 2024

MPA remains steadfast in maintaining the Singapore Registry of Ships (SRS) as a quality flag.

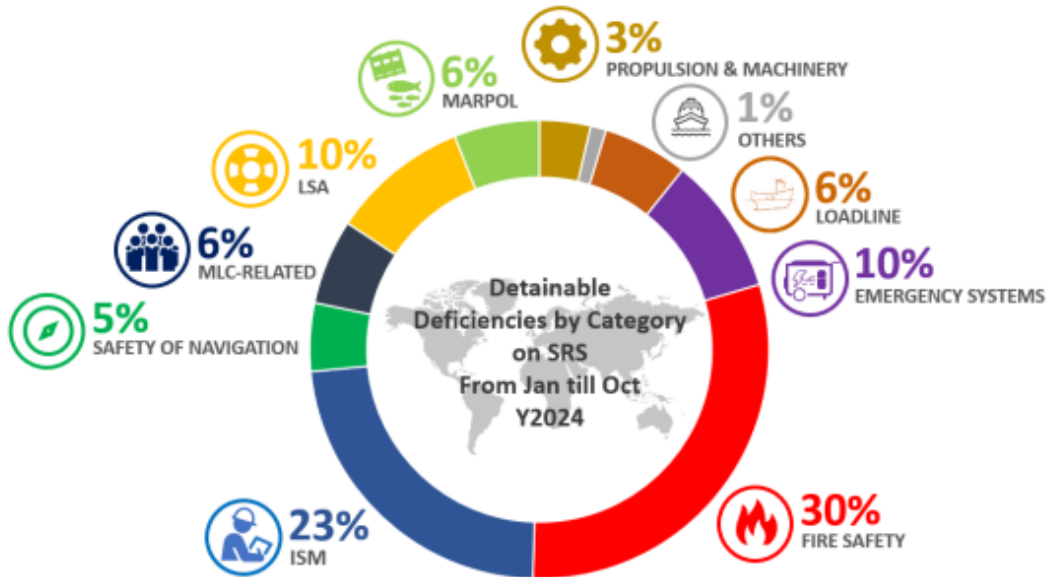
Between 1 January and 31 October 2024, Port State Control (PSC) authorities conducted inspections on 1,830 SRS vessels under the Tokyo MoU (TMOU) and 475 vessels under the Paris MoU (PMoU) regimes.

To date, 31 SRS vessels have been detained under various PSC regimes in 2024, including 19 under the TMOU (12 of which occurred in Australia), 11 under the PMoU, and 1 by the United States Coast Guard (USCG).



# SRS PERFORMANCE

Most SRS vessel detentions were due to common PSC deficiencies which could have been avoided with proper and timely planned maintenance. A breakdown below highlights the deficiency categories



\* Others include categories such as instruments

## Call to Action

SRS shipowners and ISM managers are urged to monitor their ships performance and maintenance to ensure that they are in full compliance with international rules and regulations. Any defects or non-conformities shall be promptly attended to and rectified in accordance with the ISM Code.

For defects which cannot be promptly rectified, the ship master should duly report and apply dispensation from MPA ([shipping@mpa.gov.sg](mailto:shipping@mpa.gov.sg)) and the Classification Society. The Master shall also report the deficiency to the competent authority when the vessel is calling at a port.

The cooperation of among SRS shipowners, ISM managers, crew and MPA is essential for the continued excellence of the SRS. MPA welcomes the continued collaboration among the SRS community to achieve our shared goal of maintaining a strong reputation and quality flag.

# Singapore Registry of Ships (SRS) Forum 2024

The Singapore Registry of Ships, one of the world's top five ship registries, held its annual Forum on 28 October 2024. The event was graced by Mr Teo Eng Dih, Chief Executive of MPA, and attended by over 500 industry representatives which marked the Forum's highest recorded attendance.

Themed "Sailing Through the Waves of Change", the Forum featured a series of presentations on MPA's various initiatives, such as the Maritime Energy Training Facility, Maritime Cyber Assurance and Operations Centre, maritime decarbonisation efforts, and performance of the SRS fleet.



## NEWS AND ANNOUNCEMENT

The Forum also celebrated the excellence of the SRS community, with MPA presenting the SRS Net Tonnage Contributor Award, Green Ship Award and Sail Milestone Achievement Programme to deserving awardees.

### **SRS Top Net Tonnage Contributor Award**

The SRS Top Net Tonnage Contributor Award 2024, which recognises a company for registering the highest net gross tonnage under the SRS in the year, was presented to Evergreen Marine Corporation (Taiwan) Ltd.



*Presentation of Top Net Tonnage Contributor Award to Evergreen Marine Corporation (Taiwan) Ltd*

### **SRS Green Ship Award**

The SRS Green Ship Award recognises SRS owners and ships that have contributed towards green and sustainable shipping. This year, a total of 29 Singapore-flagged ships from 12 companies received Green Ship Certificates under the Green Ship Programme.

### **Sail Milestone Achievement Programme (SailMAP) Award**

The SailMAP Award, which was first introduced in June 2022, seeks to encourage and promote seafaring as a career in Singapore. This programme offers up to S\$50,000 to each eligible seafarer upon reaching key career milestones. This year, a total of 14 seafarers were awarded the SailMAP Award.



*Congratulations to all SailMAP Award recipients!*

## NEWS AND ANNOUNCEMENT

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The event concluded with a vibrant networking night, generously co-sponsored by industry partners – Bureau Veritas Group, Eastaway Ship Management, a member of X-Press Feeders Group., Pacific International Lines (PTE) Ltd, RINA, U-Ming Marine Transport Corporation, and Winning International Group Pte Ltd.

We extend our appreciation to all participants, speakers, and sponsors for contributing to a successful SRS Forum 2024, and look forward to connecting again at SRS Forum 2025!



*Participants of the SRS Forum 2024*

### **Annex A: List of companies and individuals recognised at the SRS Forum 2024**

#### **Top Net Tonnage Contributor Award 2024**

- Evergreen Marine Corporation (Taiwan) Ltd

#### **Green Ship Programme Award Winners**

- Asiatic Lloyd Maritime LLP
- Bocom Leasing Management Hong Kong Company Limited
- Hafnia Tankers
- Eastaway Ship Management Pte Ltd
- IS Container Pte Ltd
- MISC Group
- Mitsui O.S.K Lines Ltd
- NYK Line
- PT Samudera Indonesia
- Penguin International Limited
- Wan Hai Lines Ltd
- Yinson Green Technologies Pte Ltd

## **SailMAP Award Winners**

### **Attainment of COC 1**

- Abdul Fattah Bin Shaik Ahmad
- Jerome Yam Guang Wen

### **Attainment of COC 1 and Clock Qualifying Sea-Going Service while holding valid COC 2**

- San Myat Thu
- Jerome Muhammad Sufian Bin Kamarudin

### **Attainment of COC 2**

- Navendran Rajandran

### **Attainment of COC 2 and First Ocean-Going Ship after obtaining COC 2**

- Muhamad Fareez Bin Haris

### **Attainment of COC 2 and Monthly Allowance while attending COC Class 2/1 preparatory course**

- Teo Lip Kio

### **Monthly Allowance while attending COC Class 2/1 preparatory course**

- Yin Jinghong

### **Clock Sea-Going Service while holding valid COC Class 3/5**

- Md Sakib Hasan

### **First Ocean-Going Ship after obtaining COC Class 3/5**

- Dai Jiahong
- Hidrir Bin Abdul Hamid
- Irfan Bin Mohamed Isa

### **First Ocean-Going Ship after obtaining COC Class 3/5 and Monthly Allowance while attending COC Class 2/1 Preparatory Course**

- Chan Wai Kit

### **First Ocean-Going Ship after obtaining COC Class 3/5, Clock Sea-Going Service while holding valid COC Class 3/5 and Monthly Allowance while attending COC Class 2/1 Preparatory Course**

- Abid Salwan

# MSGI – Green Ship Programme

MPA issued Shipping Circular 12 of 2024 on 29 October 2024 updating the shipping community on the revised Green Ship Programme (GSP) for SRS, which will take effect from 1 January 2025 until 31 December 2027.

The GSP has been enhanced to address the targets set by the International Maritime Organization to peak greenhouse gas (GHG) emissions from international shipping as soon as possible and reach net-zero by or around, i.e. close to 2050; the emergence of greener engines/technologies; and the Carbon Intensity Indicator (CII) requirement under MARPOL Annex VI which entered into force on 1 January 2023.

MPA encourages the shipping community to partner the SRS in adopting green technologies and solutions for ships, benefitting from concessions available through 2027. Enquiries on the programme can be made via email to [marine@mpa.gov.sg](mailto:marine@mpa.gov.sg)





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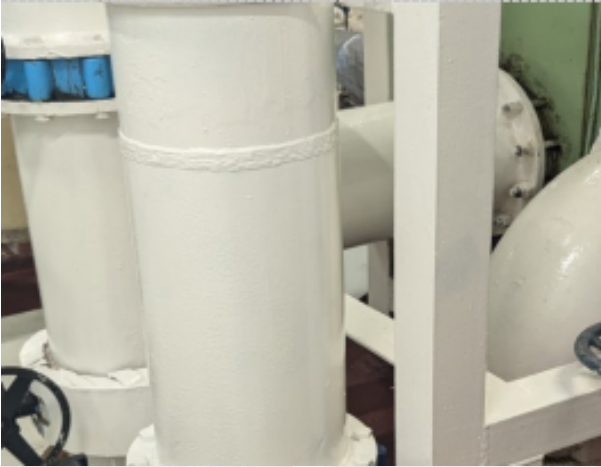
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# Engine room bilge water management procedure

Case study: Consequences of instilling incorrect work procedures

## What happened?

On 2 separate occasions in the engine room, the  
(i) drained content from LT cooler piping arrangement (“1st Occurrence”) and  
(ii) aft bilge (“2nd Occurrence”) were transferred to the Cargo Hold Bilge Holding Tank (“CHBHT”) instead of the engine room bilge holding tank.



(i) LT Cooler Piping Arrangement



(ii) Aft Bilge

The above transfers for both occasions were carried out using portable pump and discharged through the CHBHT’s sounding pipe. See screengrab on the right.

1st occurrence: The content in CHBHT was subsequently discharge overboard without passing through the oily water separator (“OWS”).

2nd occurrence: The aft bilge transfer was stopped by new joining chief engineer when he was making engine room rounds. He subsequently reported the matter.



# Why did it happen?

During the 1st occurrence, senior engineer officers instructed engine room rating to transfer the drained content into CHBHT. This experience misled the engine room rating to think that the practice is correct.

At the 2nd occurrence, when tasked by an engineer officer to lower the engine room aft bilge level, the same engine room rating applied his learning from the 1st occurrence and transferred the said bilge into the CHBHT.

## Conclusion

The Cargo Hold Bilge Holding Tank is strictly used to contain only cargo hold bilges. This tank is connected to the OWS for discharge to the sea in compliance with the relevant MARPOL provisions.

At the 2nd occurrence, the same incorrect procedure was followed by the same engine room personnel, learning from precedent set during the 1st occurrence. It is laudable that the incorrect procedure was immediately stopped by the newly joined chief engineer who then reported to the master and company.

Senior ship staffs must ensure that correct and safe work procedures are instilled in their junior staffs.

# Inadequate safety risk perception

Case study: Shore personnel accidentally falling into an open manhole onboard regional passenger ferry.

## What happened?

When a regional ferry arrived at a ferry terminal in Singapore, a ship's crew opened a manhole cover of fuel oil sounding compartment along the passageway of the passenger main deck compartment and proceeded down to take sounding. Subsequently, a Shore Official (SO), who was carrying out routine security check, accidentally fell into the open manhole and suffered a minor injury. See Figure 1 below.

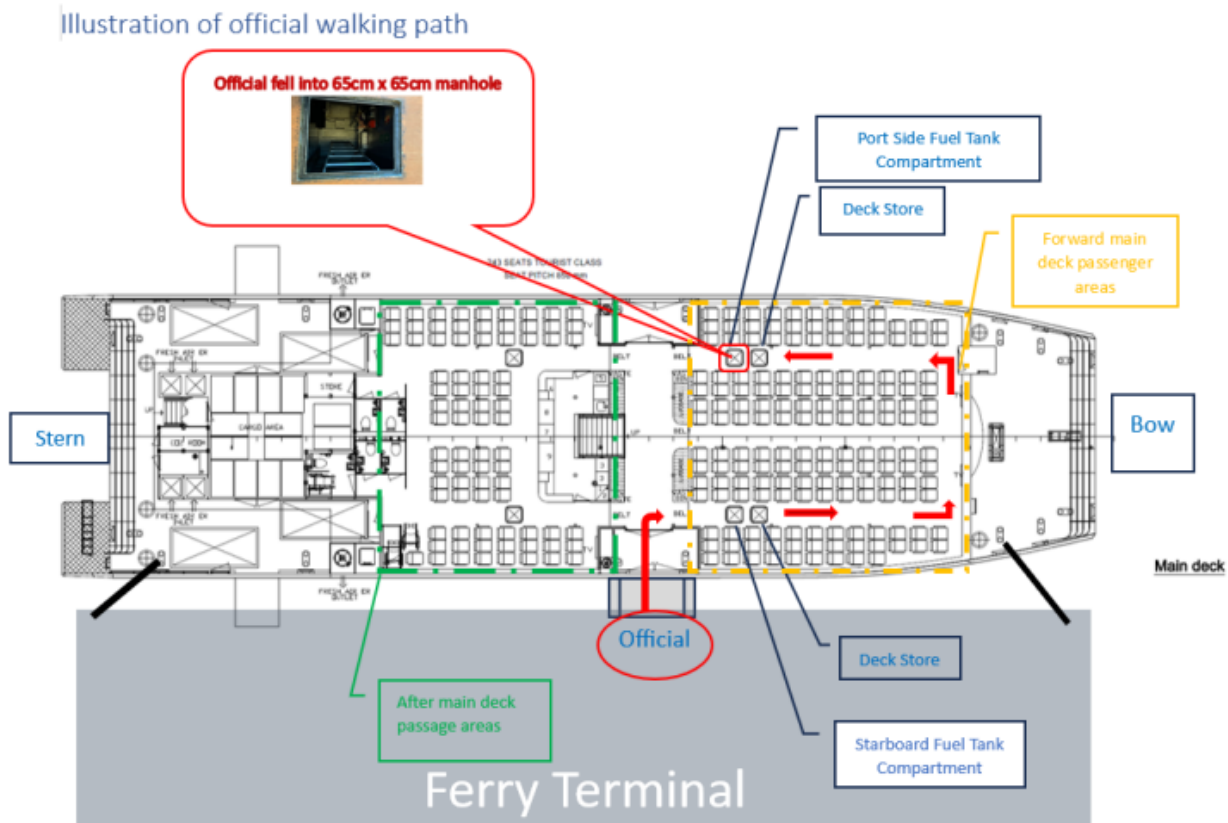


Figure 1

## CASE STUDIES

However, the red cordon / warning signage on the starboard side was removed by the engineer after completing fuel oil sounding on the starboard side. He then proceeded to carry out fuel oil sounding at the port side, on the assumption that no personnel would enter the forward passenger compartment. Eventually, he opened the manhole cover at port side fuel oil sounding compartment and proceeded down without setting up any cordon / signages, manhole grating covers or requesting another crew to standby nearby the manhole.

Based on the ferry's CCTV video footage playback, the SO entered the starboard passenger way to carry out a routine security check. The SO fell into the open manhole fuel oil compartment while walking along port side passageway and suffered a minor injury.

## Conclusion

It was assessed that the ferry's engineer had acted unsafely, having failed to put up a red cordon / warning sign, grating plate or safety barrier while leaving the open manhole unguarded. This implied that the engineer's safety risk perception was low. This plays a crucial role in decision-making regarding environmental and occupational risk management.

Additionally, there were no adopted procedures and/or work instructions with risk assessments to mitigate or eliminate the associated risks relating to daily fuel oil sounding

Lastly, the information of the open manhole cover was not made known to non-crew member, in this case, the SO, when boarding the ferry, and the SO was also unescorted by the ferry's crew, not in accordance with the ship security plan.



Port passageway with red cordon / warning signage



Centre passageway with red cordon / warning signage



Starboard passage way with red cordon / warning signage

# Unsafe work procedure

Case study: Crew crushed by falling steel plate

## What happened?

While shifting a steel plate that was stored in the steering gear room, an engine crew died when the said plate fell and crushed him

## Why did it happen?

A vessel was on her maiden voyage from building yard. Many repair materials were supplied on board which were intended for use by the crew on board to fabricate additional storage boxes and tools. These materials were stored by ship's crew in the steering gear room. Steel rod, pipe and angle bars were stored on the newly fabricated storage rack (see A in Figure 1) while the steel plates were lashed to the handrail with a 10mm nylon rope (see B, C and D in Figure 1).



Figure 1

On the day of the incident while the vessel at sea, two Senior Engineers attempted to reposition a 5mm steel plate in a stowage area prior to bringing it to the nearby cutting area (see image B in Figure 1 and image 1 in Figure 2). A Junior Engineer (JE) was tasked to hold onto other vertically leaning plates that were supported against the railing to prevent them from falling.

## CASE STUDIES

While holding on to the vertically leaning plates, the JE was instructed by one of the Senior Engineer to assist with shifting the 5mm steel plate since it was too heavy for both Senior Engineers to move. The JE released the vertically leaning plates he was holding onto and squatted down to help lift the 5mm plate (see image 3 and 4 in Figure 2). At that moment, a sudden vibration of the vessel occurred, causing those leaning steel plates to fall onto the EC (see image 4 in Figure 2).



Figure 2

## Conclusion

### Unsafe Storage and Lashing of Steel Plates

The steel plates were stored vertically and leaning against a collapsible handrail and secured with a nylon rope of 10 mm in diameter. The handrail was not designed for storing steel plates. It is neither an appropriate location nor a proper method to store them. In addition, the 10mm nylon rope that was used to lash those plates was found to be in poor condition. The condition of the rope was a persistent risk during plate handling and securing when it parts.

### Inadequate Risk Assessment (RA)

The RA for the above work activity was found to be generic and inadequate. Essentially, the RA did not identify the hazards associated with falling steel plates or the risk of injury resulted from sharp edges. At the time of the incident, the ship was pitching, and the motion increased the likelihood of the leaning plates to fall. While the JE was holding onto the remaining vertical plates, the Senior Engineer requested him to assist on shifting the 5mm steel plate. The Senior Engineers had omitted consideration of the JE's safety in relation to the risk of steel plates falling in view of the ship's pitching and rolling motions.

# Unsafe and improper implementation of Safety Procedure on Enclosed Space Entry

Case study: Fatal Incident During Enclosed Space Entry

## What happened?

On board a chemical tanker, an Able Bodied (AB) seaman wore a modified air supply equipment to enter a non-gas-free cargo tank to carry out cargo residue stripping in the pump well area. The AB was later found dead at the bottom of the said cargo tank staircase.

## Why did it happen?

The ship completed discharging of NAPTHA cargo at terminal and shifted to anchorage. Tank washing, inerting, and gas-free operations were undertaken for a selected number of cargo tanks in preparation for the next load, while the remaining tanks were only well-drained and dried (unwashed tanks) and not gas freed.

During tank inspection from the tank dome, the Senior Deck Officer (SDO) observed a small amount of unpumpable cargo residue in the pump wells of the unwashed tanks. SDO was concerned of the unpumpable cargo residue contaminate the next cargo parcel and decided to strip the pump wells using a Wilden pump.

Tanks entries of the unwashed tanks by personnel were carried out without complying with the company's enclosed space entry procedures. An AB entered one of the unwashed tanks alone to place the Wilden pump at its pump well. The AB wore a face mask with a hose coupling that had been modified to connect to the deck air compressor (see Figure 1).



Figure 1

## CASE STUDIES

The said AB failed to emerge from the tank and did not respond to radio calls. Although an emergency rescue operation was initiated, there were further delays in view of emergency response equipment such as a tripod was not kept on standby at the tank dome (see Figure 2: a re-enactment of the fatality incident).

Re-enactment of incident by ship's crew

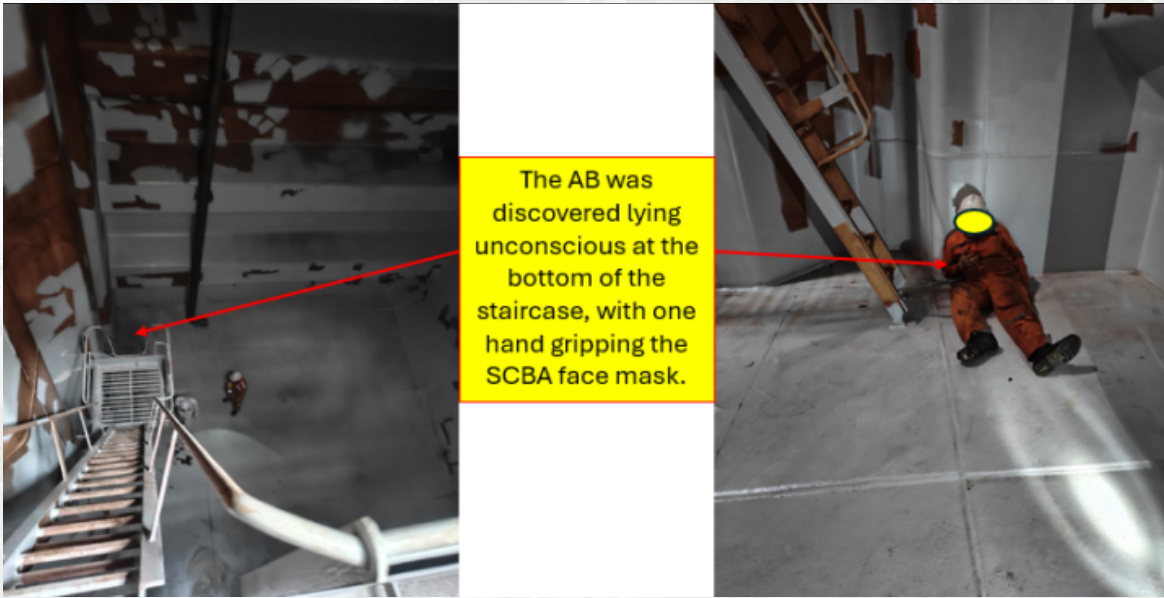


Figure 2

The AB was eventually lifted out of the cargo tank using the cargo hose crane. Despite immediate administration of cardiopulmonary resuscitation, the AB was pronounced dead by paramedics who were deployed thereafter.

## Commentary

### Enclosed Space Entry Procedure

The Senior Deck Officer (SDO) executed an unauthorised operation that violates the company's safety management system vis-à-vis enclosed space entry. This unauthorised operation led to a fatality on board.

### Modification of the decompression setup

Considering the inconvenience of wearing the SCBA, the SDO instructed an unauthorised modification of the SCBA facemask (i.e. by connecting it to the air hose with compressed air supplied by deck air compressor), which was a deviation from its manufacturer's specifications and intended scope of application.

## SAFETY ALERT

# No. 1/2024 - SAFE TRANSFER OF PERSONS BETWEEN VESSELS AT ANCHORAGES

MPA emphasises the critical importance of ensuring compliance with SOLAS Chapter V Regulation 23 on pilot transfer arrangements. Recent inspections at Singapore's anchorage have revealed instances of non-compliance, posing significant safety risks to pilots and other personnel during embarkation and disembarkation.

### Key Observations:

- Use of defective pilot ladders or improper securing methods.
- Combination arrangements (pilot ladder and accommodation ladder) improperly rigged.
- Inadequate lighting and safety measures during transfers.

### Immediate Actions Required:

1. Compliance Verification: Confirm that all pilot transfer arrangements adhere to SOLAS regulations, IMO Resolution A.1045(27), and applicable local pilotage circulars.
2. Routine Inspections: Conduct thorough checks of pilot ladders, securing points, and related equipment before each use.
3. Training: Provide regular crew training on safe rigging and operation of pilot transfer arrangements.
4. Maintenance: Repair or replace defective equipment immediately.
5. Incident Reporting: Report any identified deficiencies or near misses to the relevant authorities promptly.



Non-compliant pilot ladder

## SHIPPING DIVISION SAFETY ALERT

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### Safety Bulletin: Non-Compliant Pilot Transfer Arrangements at Singapore Anchorage

#### **Importance of Compliance:**

- Non-compliant pilot transfer arrangements can lead to severe injuries or fatalities. Ensuring compliance demonstrates a commitment to safety and professionalism in maritime operations.



Defective Pilot Ladder



Defective pilot ladder (twisted and ropes parted)

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**Seafarers Policy, Development & Welfare Department (SPDW):**  
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**Flag/Port State Control, Ship Regulatory, Design and Standards  
Department (FSC/PSC/SRDS):**  
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**Seafarers Skills Upgrading, Certification and Accreditation Department  
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