THE REPORT

The Magazine of the International Institute of Marine Surveying

SEPTEMBER 2022
ISSUE 101

ADVANCING SAILING TECHNOLOGY WITH SAFETY IN MIND

A MOST DANGEROUS TRADE: THE PROBLEMS OF LIQUEFACTION

WHAT CHANGES TO SOLAS 2024?

Blistering Barnacles!

Surveyor's Bag

Lithium-ion Batteries – Should we be Concerned?

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The Magazine of the International Institute of Marine Surveying **SEPTEMBER 2022 • ISSUE 101**

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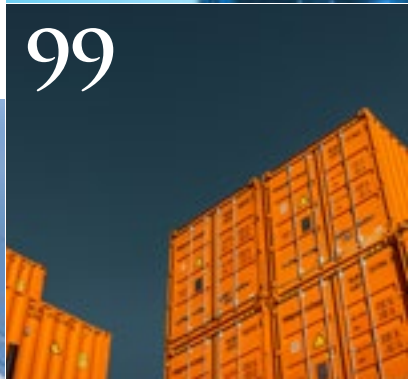

Editor's Letter

Dear Colleague

Welcome to the start of the second century of Report Magazines – edition 101. Assuming four publications per year, I would expect issue 200 to be reached in 2047! One can only wonder what the world of marine surveying might look like then and the technological advancements that will have been made, including decarbonization, digitization and remote surveying amongst them.

But back to reality. I must thank all those who made time to participate in the IIMS Membership Survey 2022. Much has changed in the world since the last one four years ago and this is reflected in the findings, as one might expect. I have written a short overview of the findings to support the numerical results and graphics that are published on page 36.

Due to pressures of space and time, there is no 'A Day in the Life of' feature in this edition, but it will reappear in December.

The concerning topic of end of life boats - there are estimated to be as many as 15 million in Europe alone - is addressed in a short article entitled *Is the world finally starting to take the dismantling of end of life boats seriously?* It seems the French and Americans are waking up to this dilemma and plan to take it seriously - see page 98.

It seems the antifouling/biofouling game is changing and this edition places the spotlight on the subject with three feature articles on this important matter. *Biofouling management: the benefits of a clean hull* assesses Australia's new regulations (page 80); *Antifouling innovations: a plan for ecological boating* (page 78) brings readers up-to-date with the latest thinking and developments surrounding biofouling and, on page 84, *Blistering barnacles! The sticky problem of biofouling* looks to see if regulation and innovation can really make a distance. You will be an antifouling/biofouling expert once you have digested this content!

The article by Bond Solon (page 118) called *How Independent Are You?* will set your mind thinking, even though the case concerned is not marine related. The challenges and nuances of giving expert witness are laid bare in a review of a tragic case.

Too often I find myself having to talk about depressing topics and fires in engine rooms is certainly near the top of that list. In the article entitled *Look out for fuel leaks and unshielded hot spots in engine rooms*, three executives from Gard AS analyse the cause of fires in engine rooms - see page 92.

The vexing subject of container stack collapses and containers overboard continues to rage and is covered in two articles. In the feature *Eliminating the risk of container stack collapses* (page 104) by Glen Mathias, he brings his detailed knowledge of the subject to the fore. *Containers lost at sea* (page 99) presents the results of a decade's worth of statistics published by the World Shipping Council. Although the number of containers lost is a tiny percentage of the millions carried ever year, it could be argued that one container lost at sea is one too many, particularly given the damage it could cause.

And finally, my thanks to Immediate Past President, Geoff Waddington HonFIIMS and current President, Peter Broad FIIMS, both of whom have authored features for edition 101. Geoff has produced an enchanting article about some of the historic little ships that survived the Second World War, still in service as pleasure vessels, with which he has been involved (page 52). And Peter has written the article entitled *Time for transparency about accidents* (page 33) in which he argues it is not generally considered fair or reasonable to 'blame' the "sub-standard equipment that kills people".

Survey well.

Mike Schwarz,
Chief Executive Officer

The President's Column

Dear Members,

It is with great pleasure that I write my first column as President of IIMS.

I must thank Geoff Waddington, now our Past President, again for all his sterling support to the Institute and particularly the permanent staff at Murrills House over the past two years through very difficult times with the pandemic.

It was a pleasure to attend the AGM in June at Murrills House and also to meet up in person with all the office staff and to attend the Seawork trade show in Southampton. Some interesting trade stands but not so many attendees this year, still put off by COVID and the cost of travel.

I write my first President's column with my recent experience of attending Warsash Maritime Academy to carry out an STCW short course so that I can revalidate my Chief Engineers Class 1 COC still fresh in my mind.

This is where I get on my soapbox, and I make no apology for my observations in the hope that we as an organization can be part of the future of what seems to be an unattractive industry to come into as a marine professional (deck or engineer officer cadet).

I was a marine engineering cadet at Warsash between 1986 and 1990. It was a vibrant and exceptional place of learning. There were 200 cadets per year intake (circa 100 deck, 100 engineering). These annual numbers of intake were similar in the other UK Merchant Navy Colleges in Newcastle, Plymouth, Liverpool and Glasgow. Most cadets went on to have jobs with the shipping companies that had sponsored them through the cadetship.

To say that I am disappointed to see the condition of Warsash now would be an understatement. I honestly think it is actually a disgrace to see what it has become. All the accommodation buildings, administration buildings, and Mountbatten library are derelict with broken windows and curtains blowing in the breeze like some Holocaust from Ukraine. The purpose-built engineering workshop building, which was constructed in 1988 -1989 has been demolished and

it's no longer there. Where has all the equipment gone? The 'new library' which was dedicated by Lady Mountbatten in 1989, is a shell with all the internals destroyed and no books.

I understand that the main site has been sold off by Solent University to property developers and will be repurposed into expensive luxury apartments for people who have no knowledge of the background and history of the site.

The courses that I recently attended were carried out in a temporary two-story building on the lower site, where the 'new workshops' (1988) used to be. I was informed by the staff that there are works in progress to build a new training establishment there for these STCW courses and this has been delayed because of COVID; however the site at the moment is not at all inspiring. That said the staff and the quality of the STCW short courses that I attended were very good.

I understand that the current intake of Southampton cadets is embedded in mainstream Solent University life in Southampton at St Mary's and the current intake is only around 20 per year. Many of these cadets will not get jobs with the companies that are sponsoring them through the cadetship.

There is an interesting YouTube video about the history of Warsash - see **https://www.youtube.com/watch?v=vZlmLF2tkBs** which takes us up to 2017. I'm not sure that there has been any positive progress since then.

Where will they get their practical seagoing experience from? Where will 'we' get our next generation of Superintendents and Surveyors from?

If any readers have any opinions or experience about other MN colleges, please let's hear your news and views.

As we all know an academic qualification is no substitute for practical experience and on-the-job training.

The good news is that the MCA has been super-efficient and revalidation of my Class 1 COC was carried out within 24 hours of receiving my online application. Their normal turnaround time is two weeks. Well done to the MCA - **revalidation@mcga.gov.uk**. They have been very helpful in correspondence and advice on revalidation.

This brings me to our, IIMS professional qualifications, and mentoring of less experienced surveyors. It is not enough for a surveyor to 'just' complete a course in a surveying discipline unless he or she can use that knowledge practically to consolidate their learning and have some guidance in that process.

Using IACS governance as an example, it takes a minimum of two years for a Classification Society surveyor to achieve the minimum experience in their 'certificates of authorization' for them to conduct surveys without senior supervision or sign-off. During the first two years, they are classified as 'Supervised' while carrying out surveys. As they progress, they will achieve 'Un-supervised' status for the various survey types. That is after they have joined a Class Society either as a Graduate or from a seagoing and/or industry professional background. Normally a new surveyor will have a mentor or a training supervisor, who will help and guide them to attend the necessary types of survey to allow them to develop their practical skills and experience.

In our world - non-IACS surveying - whether it be for yachts, small commercial vessels, or large commercial craft, for insurance, or on behalf of an owner, we need NO FORMAL QUALIFICATIONS or EXPERIENCE.

All 'you' need to call yourself a 'surveyor' is a client willing to pay you to carry out a particular survey.

While IIMS is the leading professional organization providing both training for surveyors and practical courses to develop skills and experience, it remains difficult for small, one-man operators, to receive mentoring and knowledge sharing from other more experienced surveyors, who have greater industry knowledge.

I open this to our members and readers to consider 'How' we can help mentor our fellow, less experienced surveyor members and 'Who' would be prepared to become a mentor. We will be discussing this further in future IIMS publications.

Mike, has as always, been proactive in preparing and running a members' survey. The last one was conducted four years ago. He has kindly shared some of the initial feedback and raw data with me from this year's survey. It is pleasing to see that we have had a high open rate of the emailer of 65% with a good number of surveys returned. We all need feedback on our work from time to time and IIMS as an organization is no exception. We cannot implement continued professional development (CPD), or develop new membership benefits as an organization without your feedback. Thank you to all members who have taken the time to respond.

I can't share all the feedback in my column – there is too much data: but some points of note:

Q2. Why is your membership important to you and what are your main motivations for being a member?

76% of respondents said: 'Because it is essential to be a member of a recognised professional surveying body'.

Q3. What is your level of engagement with IIMS would you say?

68% of respondents are either fully or somewhat engaged.

Q4. How would you rate the range of IIMS membership benefits?

It is alarming that some (albeit a few) who have been in membership 10 years plus don't know what the membership benefits are.

Q5. Which of the following membership benefits have you taken advantage of?

It's good to see safety briefings scoring well. The membership card is popular with a third of members. And podcasts are more popular than expected.

Q6. Please give your opinion about the quarterly Report Magazine.

The appeal ratings for The Report are high with 81% reading each edition or opening it more often than not (38% reading each edition).

Q18. When you think about other marine surveying (or similar organisations) that you belong to, or know of, how highly would you rank IIMS?

Once again, a very high approval rating for the Institute as a whole with 69% ranking IIMS higher than most other similar organisations.

Mike has reported more fully with the results of the survey shown elsewhere in this publication.

If you would like to reply to me on any of the topics raised in this my President's Column, we have opened a new **president@iims.org.uk** email which Mike and I will monitor. I hope to hear your views and thoughts on any subject matter related to marine surveying.

Peter Broad,
CEng, CMarEng, FIIMS, FIMarEST
President IIMS

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PROPOSAL TO BAN SEWAGE SLUDGE DUMPING MADE TO IMO

A proposal to ban the worldwide dumping of sewage sludge into the oceans has been made to the IMO by South Korea and Mexico. The proposal is being made some 50 years after the 'Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972', known as the 'London Convention', was drawn up to protect the marine environment from human activities.

In 1996 it was updated to include a so-called 'reverse list', which listed certain wastes that could be dumped – and it included sewage sludge. This latest proposal seeks to remove sewage sludge from the list of waste considered acceptable to dump in the sea.

In fact, the practice is already widely prohibited under regional conventions, a worldwide review of current practices found, and through domestic legislation.

Whether to adopt the proposal will be decided at the next meeting of contracting parties in October. If it is removed from the list then, it will go in force 100 days later.

THE GERMAN BUREAU OF MARITIME CASUALTY INVESTIGATION ANNUAL REPORT PUBLISHED

The German Bureau of Maritime Casualty Investigation (BSU) has published its 67 page annual report and in doing so it has noted that the total number of notifications is significantly higher than in 2020.

There were 659 incidents reported in 2021 in comparison with 602 the previous year – an increase of almost 20%. The number of reports outside the statutory responsibility of the BSU is almost identical in terms of actual figures (249 in 2020 versus 247 today) but has fallen in percentage terms from 42% to 38%.

In particular, marine casualties according to the IMO Code have increased from 109 to 132, representing an increase of more than 20%. The number of incidents has also increased by almost 15% from 244 to 280. BSU is encouraged that the number of fatalities and injuries in merchant shipping remains at a very low level compared to previous years.

Download the full report at **https://bit.ly/3uM0U8E**.

BOOK IT RIGHT AND PACK IT TIGHT

Updated guidance on packing dangerous goods for carriage by sea has been published. As part of their commitment to continued knowledge transfer, the Loss Prevention Department of the UK P&I and TT Club have updated their industry leading "Book it right and pack it tight" publication, to bring it in-line with the most current thinking and regulations.

1 June 2022 marked the date of mandatory enforcement of the latest version of the IMDG Code, Amendment 40-20. As a consequence, UKP&I and TT have again collaborated to update their publication 'Book it right and pack it tight'. This guide provides key insights for all participants in the freight supply chain responsible for preparing unitised consignments for carriage by sea. The guide is intended to provide an overview of the key practical duties under the IMDG Code for each individual and entity, while not seeking to meet the mandatory training requirements.

Download the guide at **https://bit.ly/3aEJUu8**.

DATA DRIVES AMSA COMPLIANCE FOCUS

Incident and inspection data on emerging risks to safety, continues to sharpen the compliance focus of the Australian Maritime Safety Authority (AMSA) with the release of its third consecutive National Compliance Plan on 1 July 2022.

AMSA Executive Director of Operations, Michael Drake, says the plan outlines the regulator's compliance activities for the year to come, and its achievements for the previous year.

"We are very pleased to see that overall, deficiency and detention rates for foreign-flagged and regulated Australian vessels remain low and this is because we continue to take a zero-tolerance approach to sub-standard shipping," Mr Drake says.

"Despite this progress, there is always room for improvement which is why we have outlined a number of focus areas for compliance for the 2022-23 financial year.

"Data shows that in recent years there has been a steady rise in issues relating to planned maintenance like failures or defects in onboard critical equipment, vessel structure and fire safety around cargo operations on foreign-flagged and regulated Australian vessels.

"Water and weathertight integrity issues are also on the rise across these vessels, particularly on bulk carriers, after an increase in the proportion of all detainable deficiencies identified during inspections leaped from 4.1% in 2019 to 9% in 2021."

NEW MARINE RESCUE BOAT OFFICIALLY WELCOMED TO JERVIS BAY

Parliamentary Secretary for Australia's South Coast, Shelley Hancock, has officially welcomed Marine Rescue Jervis Bay's $791,000 rescue boat Jervis Bay 41 in a ceremony conducted at Huskisson this afternoon.

Ms Hancock was joined by Marine Rescue NSW Commissioner Stacey Tannos and Mayor of Shoalhaven City Council Amanda Findlay in a ceremony to officially commission Jervis Bay 41 to the Marine Rescue NSW fleet.

"Jervis Bay 41 is one of 38 new rescue vessels funded by a $37.6 million four-year State Government investment to support the vital, life-saving work of Marine Rescue NSW volunteers," Ms Hancock said.

WORLD'S FIRST FAST ELECTRIC FERRY IS SET TO ENTER SERVICE IN NORWAY

The world's first fully electric and zero-emission fast ferry, classed as a high-speed craft, recently completed construction and is being delivered to its new homeport in Stavanger, Norway. After final trials, the vessel, MS Medstraum, is scheduled to begin a regular commuter service in Norway.

The vessel was built using a unique modular manufacturing method at the Norwegian shipyard, Fjellstrand. According to the shipyard, modularisation helped to cut both production costs and engineering costs and will contribute to making electric-powered high-speed vessels competitive in terms of both cost and the environment.

"It's been challenging building this ship, as it's never been done before, but we've learned a lot. Fast ferries require a lot of energy so we needed to make Medstraum lighter and a lot more efficient than traditional fast ferries," said Edmund Tolo, head of research and development at Fjellstrand AS.

FIRST GOLD ANCHOR AWARD PRESENTED TO A NEW ZEALAND MARINA

Auckland's Westhaven Marina has become the first in New Zealand to gain a Gold Anchor award. The huge 1,800-berth marina secured 4 Gold Anchor accreditation from the Marina Industries Association (MIA), the global scheme run in association with The Yacht Harbour Association (TYHA) in the UK.

Westhaven Marina is located in Auckland's city centre and has grown steadily since 1946 as the recognised hub of recreational boating in Auckland. The bustling marina is home to over 1,800 recreational boats, four yacht clubs and a variety of marine businesses and hospitality establishments.

In announcing this award, Suzanne Davies, MIA CEO, said: "Westhaven Marina is the largest recreational boating facility in the Southern Hemisphere and the first Gold Anchor marina in New Zealand. It's an amazing achievement and a credit to the Westhaven team in creating such an incredibly comprehensive marine facility."

ELON MUSK'S SPACEX LAUNCHES HIGH-SPEED INTERNET SERVICE FOR SEA GOING VESSELS

Elon Musk's firm SpaceX is expanding its Starlink satellite internet service to offer high-speed internet to yachts, oil rigs and merchant vessels.

The Starlink Maritime website claims users can enjoy 'high-speed, low-latency internet' that reaches download speeds of 350 megabits per second, even in the 'most remote waters in the world.'

The service comes at a cost, however. The initial hardware fee is US$10,000 for two 'ruggedized' terminals, and thereafter follows a monthly fee of US$5,000 for the service. SpaceX says that the service can be paused at any time.

However, Musk took to social media to defend the large pricing difference, arguing that the maritime service was not the same as the residential service, due to the harsh conditions boats can encounter. He explained that the 'high-performance' terminals are designed to withstand salt spray and strong winds, and maintain a connection in storms and choppy seas.

XFUEL LANDS €8.2M INVESTMENT FOR LOW-CARBON MARINE FUEL

XFuel has secured €8.2 million in its latest round of investment. This, the company says, lays the foundation for the commercialisation of its next-generation synthetic diesel, marine and jet fuel technology.

XFuel says its patented technology efficiently converts biomass waste into low-cost, drop-in fuel that can be used in road, marine, and aviation applications. It uses feedstock from sustainable waste sources in manufacturing, construction, forestry, and agriculture. Its fuels comply with marine and road fossil fuel specifications and can therefore be used in existing infrastructure and engines, either blended with conventional fuels or as a replacement.

Using modular and scalable biorefineries, XFuel says it can produce high-grade fuels at a comparable or lower price point to fossil-based fuels on the market. The firm reports that independent assessments show that XFuel's technology can currently deliver fuel with GHG savings of 85 per cent, with the potential to deliver carbon-neutral and negative fuels in the future. The technology enables cost-efficient and transformative carbon emissions reductions without requiring significant capital investment.

OCEANCO WITHDRAW THEIR REQUEST TO DISMANTLE HISTORIC ROTTERDAM BRIDGE

Oceanco, the company building the world's largest sailing yacht for the Amazon.com co-founder informed Rotterdam City Council that it won't request the dismantling of the lift bridge De Hef, according to two council members.

Photo credit: Dmitry Rukhlenko/Shutterstock

Vincent Karremans, a deputy mayor for public works and mobility, said Oceanco will "for the time being not request the environmental permit for the removal of the bridge." Were the Alblasserdam, Netherlands-based company to change its mind, it would have to "initiate and successfully complete a new licensing procedure," which could take at least eight weeks, a spokesperson for Karremans told Bloomberg.

The 95-year-old De Hef is considered an icon of Rotterdam's industrial heritage as a shipbuilding hub, and news of its partial dismantling had caused a stir among locals.

WÄRTSILÄ SET TO RELEASE FIRST METHANOL FUELLED SHIP ENGINE IN 2023

Marine and energy equipment maker Wärtsilä will roll out its first methanol-powered engine in a new ship next year as the group accelerates green fuel technology options for shipping, a company executive said.

Engines can run on both green methanol, which is produced by using renewable sources such as biomass and solar energy, and normal bunker fuel as there is still not enough carbon-neutral fuel available in the market.

Finland-based Wärtsilä will deliver the dual fuel engine, which can use methanol as well as diesel, next year for an offshore wind installation ship ordered by Dutch marine contractor Van Oord and expects more orders to come, Roger Holm, president of the group's marine power division, said.

"If we want to be where we need to be by 2050, it needs to involve green fuels," he told Reuters.

THE BAHAMAS RECOGNISED FOR ITS CONSISTENTLY HIGH-QUALITY STANDARDS

One of a minority of Flag Administrations to appear on the recently announced Qualship 21 list, The Bahamas is proud to be recognised as among the world's most elite Flags.

This is the tenth consecutive year that The Bahamas has been recognised by the United States Coast Guard (USCG) for the excellent quality of its fleet. The Qualship 21 initiative was first set up in 2001 by the USCG to identify high-quality ships operating in US waters. The US QualShip 21 certification serves as an industry performance indicator of quality and The Bahamas is proud to have achieved this recognition every year since 2012.

The announcement of the Qualship 21 list followed closely on the publication of the Paris MoU 2021 annual report where The Bahamas is once again the highest ranking non-European Flag and appears in the top five of registries. Further evidence of The Bahamas' quality is also highlighted through the retention of Whitelist status on the Tokyo MoU 2021 annual report.

MOL TESTS MICROPLASTICS COLLECTION SYSTEM WHILST AT SEA

Japan's Mitsui O.S.K. Lines recently completed testing on a new device developed with Miura Co. that can continuously collect microplastics from seawater while a vessel is underway. The device, which builds on the companies' previous efforts to filter microplastics while vessels are on dock, was demonstrated recently on the MOL-operated car carrier Emerald Ace.

With the aim of collecting microplastics, which are increasingly polluting the world's oceans, MOL and Miura have been working together to design devices that capture the small plastic particles contained in seawater. The first system launched in November 2020 collects and traps the participles with a filter with a backwashing function, which is incorporated into the ballast water treatment system. Ballast water being treated for release passes through a fine filer that traps the plastics before the waters leave the vessel. After a successful test on a wood chip carrier, MOL has installed the system on five vessels, including three bulk carriers and two wood chip carriers. While these vessels are unloading ports, the systems treat a total of about 16,000 m3 of seawater.

On the Emerald Ace, microplastics were continuously collected while sailing, by connecting the system to the cooling seawater line, which always draws in seawater. This gives the system an annual seawater treatment capacity about 70 times that of the previous device.

WORLD'S LARGEST CONTAINERSHIP DELIVERED

A subsidiary of China State Shipbuilding Corporation (CSSC) is reported to have delivered the world's largest containership in Shanghai. Named Ever Alot, the vessel has a carrying capacity of a massive 24,004 twenty-foot equivalent units (TEU), which gives her the unofficial world record-holder title. The vessel measures 400 meters long by 61.5 meters wide and a draft of 17 meters.

Ever Alot was delivered by Hudong-Zhonghua Shipbuilding, a subsidiary of CSSC, to a subsidiary of Taiwanese shipping company Evergreen Marine Corporation. The vessel is the seventh in what is called the Evergreen A class and the first ship in the class - and the world - to surpass the 24,000 TEU mark.

METSTRADE AND WATER REVOLUTION FOUNDATION PUT SPOTLIGHT ON VERIFIED SUSTAINABLE SOLUTIONS

Image credit: METSTRADE

METSTRADE, the world's greatest exhibition and networking event for B2B leisure marine equipment suppliers and buyers, is further building on its consistent efforts to promote best practice in sustainability across the sector.

In addition to other initiatives, this year's show will introduce a 'Superyacht Sustainability Route' in collaboration with the Water Revolution Foundation. Focused on the superyacht industry, this new initiative will indicate exhibitors on the METSTRADE 2022 show floor who have passed the Foundation's rigorous Life Cycle Assessment with a verified entry in its Database of Sustainable Solutions.

Water Revolution Foundation is a public benefit organisation, based in the Netherlands. It grew out of a small group of superyacht industry leaders who shared a belief that the industry must change course to better look after the planet and guarantee its future. The Foundation was launched on stage at The Superyacht Forum in 2018, held next door to METSTRADE in RAI Amsterdam.

METSTRADE takes place in Amsterdam from 15-17 November. More details at **https://bit.ly/3IAInSo**.

ONE TO IMPLEMENT PENALTY FEE FOR MISDECLARED CARGO

Photo credit: ONE

Ocean Network Express (ONE) will implement a penalty fee that is to be levied in the event of misdeclaration of cargo details at time of booking.

The penalty fee shall apply in, including but not limited to misdeclaration of cargo details at time of booking submission is detected, specifically, including but not limited to, cargo weight, which deviates more than +/- 3TON/TEU from the final Bill of Lading Instruction details and Verified Gross Mass (VGM) documentation.

In relation to the VGM amendment and misdeclaration after VGM cut-off, the applicable amendment and misdeclaration fees shall apply to concerned shipments.

The Weight Discrepancy Charge (WDS) of USD 2,000 per container will be applicable from July 1st, 2022.

TWO GIANT BULKERS TO BE FITTED WITH ROTOR SAILS

Singapore-based dry bulk owner Berge Bulk is accelerating its use of wind-assisted propulsion technology by contracting with Anemoi Marine Technologies to supply rotor sails for two vessels in its fleet. Just days after Berge Bulk agreed to equip its Newcastlemax bulker Berge Olympus with BAR Tech WindWings, supplied by Yara Marine Technologies, the company announced that Anemoi Marine will supply wind-assisted propulsion technology for two of its bulkers.

UK-based Anemoi Marine builds rotor sail propulsion systems for commercial vessels, a technology that is fast gaining traction as the global maritime industry pursues a lower-carbon future. Anemoi and competitor Norsepower have a growing number of vessel references as shipowners look for new ways to save on fuel and reduce emissions.

Photo credit: Anemoi

SINGAPORE RANKED NUMBER ONE SHIPPING CENTRE FOR NINTH YEAR RUNNING

Singapore has secured the top spot once again in the Xinhua-Baltic International Shipping Centre Development Index Report. It is the ninth consecutive year that the report, published jointly by Chinese state news agency, Xinhua, and global maritime data provider, the Baltic Exchange, has ranked Singapore as the leading global maritime centre.

The city state scored 94.88 out of a possible 100 points, whilst second on the list was maritime professional services stronghold, London, with 83.04 points. Meanwhile, Shanghai, home to the world's largest port, takes third place with 82.79 points.

Singapore has earned its longstanding spot at the top of this shipping centre index due to its wide and established ecosystem of professional global maritime services, good governance, ease of doing business and large and strategically situated port.

Further down the top ten, there was little movement as Hong Kong, Dubai, Rotterdam and Hamburg take fourth, fifth, sixth and seventh place respectively.

FIRST ELECTRIC FLYING FERRY SET TO TRANSFORM STOCKHOLM'S WATERBORNE PUBLIC TRANSPORT

The world's fastest electric ship, the Candela P-12 Shuttle, is set to hit Stockholm's waters next year, heralding a new era of transport. The innovative hydrofoiling electric ferry will reduce emissions and slash commuting times and the city believes it will make waterborne public transport more attractive than trains, buses and cars.

The marine technology company Candela released the first pictures of what will be the world's fastest, longest-range and most energy efficient electric ship ever. The Candela P-12 Shuttle, as the innovative vessel is called, will be shuttling citizens between the sprawling Stockholm suburb of Ekerö and the city center in the coming year. Flying across the water, the 30-passenger electric vessel has a speed of 30 knots – considerably faster than any other electric ship in the world. The secret to its high speed and long range are the three carbon fiber wings that extend from under the hull. These active hydrofoils allow the ship to lift itself above the water, thus decreasing drag.

With the ability to cover even the longest routes in Stockholm at high speeds, the Candela P-12 Shuttle will be used by the to shorten the commute between the rapidly expanding Stockholm suburb of Ekerö and the city center. Currently a 55-minute trip by bus, subway, or conventional ferry (or even car during rush hour), the Candela P-12 Shuttle will cover the 15 km route in only 25 minutes – saving the commuter an average 50 minutes per day.

NEW POLICY FOR ASSESSMENT AND CERTIFICATION OF NOVEL VESSELS ISSUED BY AMSA

The Australian Maritime Safety Authority (AMSA) has set out a new policy statement for the assessment and certification of what it terms 'novel' vessels. If operators are planning to build or buy a vessel within one of the vessel types set out in the policy, they should contact AMSA for advice on whether it is considered novel and the best certification pathway for the vessel.

Vessel types AMSA consider to be 'novel':
- Submarines
- Passenger-carrying submersibles
- Dynamically supported vessels (including fully foil-born, and vessels that are partially foil supported)
- Wing-in-ground effect (WIG) vessels
- Autonomous vessels greater than twelve metres in length, or those intending to carry people
- Vessels with alternative fuel technologies including hydrogen, ammonia, and gas-fuelled engines, and
- Vessels with electric propulsion and installed battery power exceeding 30kWh.

Photo credit: AMSA

AMSA may consider larger battery power installations on application. For example, in circumstances where the system is inherently safe and issued a type approval by a recognised organisation based on applicable and relevant rules and type approval schemes for marine battery systems. Applicants must be able to demonstrate competency in design and installation.

AMSA has advised anyone planning to design, buy or build a vessel in one of these categories to email: nscvfeedback@amsa.gov.au for advice on classification and certification advises AMSA.

The policy statement provides clarity to the maritime design, construction, engineering and surveying sectors in relation to the assessment and certification of novel vessels. The policy is also relevant to fleet owners and operators thinking about building or buying new vessels that may fall under the novel vessels categories.

EU REPORT PUBLISHED ON HOW THE RECREATIONAL CRAFT DIRECTIVE COULD EVOLVE

A second report has been published on how the Recreational Craft Directive 2013/53/EU should be updated going forward.

In this much-awaited report, the European Commission has assessed the technological and economic feasibility of further reducing exhaust emissions produced by recreational craft and their fuel systems.

It also evaluates the appropriateness of the current watercraft design categories in light of different weather conditions and the impact of this categorisation on manufacturers and end-users.

The report found that approximately 80% of recreational craft currently in service are not covered by the exhaust emissions limits introduced by the RCD in 2016. Despite this, real-world exhaust emissions from recreational craft will fall as the fleet is gradually replaced and equipped with modern, clean engines. A further reduction of exhaust emissions from recreational craft engines is technically feasible with the installation of advanced catalyst technologies, but they're a high and long-term investment with a payback period of 16-20 years.

Exhaust emissions can also be reduced by using electric and hybrid engines. Though currently, these applications are competitive only for low-powered motorboats and some sailing boats, their uptake will increase when the forementioned limitations are tackled. The Commission said it will continue to closely monitor technological and market developments and where appropriate, use legislative proposals to set more ambitious emission standards going forward.

Read the full story and download the report at **https://bit.ly/3pAnbmA**.

BUNKER FUEL CONTAMINATION CASES ARE ON THE INCREASE

UK P&I Club has said bunker fuel analysis indicates more cases of contaminated bunker fuel in the Rotterdam and Amsterdam areas (ARA), suggesting that the problem persists. During July, Veritas petroleum services (VPS) issued a bunker alert regarding the same issue. VPS reported that they had investigated samples of very low sulphur fuel oil (VLSFO) taken in the ARA region following reports that vessels using these fuels were experiencing operational problems, such as excessive wear of fuel pump plungers, barrels and injectors. One vessel lost propulsion and had to be towed, and the failure started with engines unable to take the load due to damage within the fuel system.

"Using GC-MS (Gas Chromatography-Mass Spectrometry) analysis methodology, numerous volatile organic compounds were detected within these fuel samples", said Mr. Ghosh.

The organic compounds that were detected in these fuel samples are Phenols, Styrenes, Alcohols and Ketonic compounds, ranging up to 40,000 ppm (4%) in total. This range of combinations does not originate from normal refinery processes and indicates contamination. Phenol-like compounds are often associated with fuel pump wear and damage. The type of problems reported by the vessels was similar to those found with the recent Singapore chlorinated hydrocarbon issues, but the contaminants were different this time.

GOLD COAST CITY MARINA AND SHIPYARD TRAINING ACADEMY TO SUPPORT THE AUSTRALIAN SUPERYACHT INDUSTRY

A new specialised training academy has been established at the centre of the booming superyacht industry on the Gold Coast to support record growth and demand for workers as local and international buyers continue to splash out on luxury marine craft.

With a number of new boats of all sizes being delivered to buyers in Australia, arriving for refits, or just visiting the Gold Coast, the training academy will be the first in Australia to be established at a shipyard. The academy at the Gold Coast City Marina and Shipyard (GCCM) will begin turning out an in-demand pipeline of skilled marine trades workers to fill labour shortages across the $80-billion industry, from marine labourers, to trade assistants, trimmers, fabricators, painters, electricians, carpenters, shipwrights and plumbers.

GCCM CEO Trenton Gay says the marine sector had grown at an unprecedented rate, offering a massive spread of sophisticated and innovative job opportunities.

"The marine industry is fast-paced, multi-layered and ever-evolving so for those seeking out new career paths, the academy is an ideal way to get the right advice and appropriate training," Gay says.

"Australia is being recognised internationally now for the quality of marine trades we offer, so it is important that we enhance the flow of job opportunities and talent within the industry."

Photo courtesy of GCCM

BEIS UPDATES THE LIST OF DESIGNATED STANDARDS FOR THE RECREATION CRAFT REGULATIONS

The Department of Business Energy and Industrial strategy (BEIS) has published its amendments to the list of designated standards (the ISO standards which, if followed, give an automatic presumption of conformity). The notice is split into two annexes. Annex one has two parts. Part one shows the new standards which are now being designated (and part two gives the full list of all designated standards).

The new standards being designated for Recreation Craft Regulations are as follows:

EN ISO 8847:2021 Small craft – Steering gear – Cable over pulley systems
EN ISO 8849:2021 Small craft – Electrically operated bilge pumps
EN ISO 14946:2021 Small craft – Maximum load capacity
EN ISO 8099-2:2021 Small craft – Waste systems – Part 2: Sewage treatment systems
EN ISO 14945:2021 Small craft – Builder's plate

Annex 2 of the notice gives the dates that standards will have their designation removed i.e. you will no longer be able to use that particular revision of the standard for automatic presumption of conformity. Again, this annex is split into two parts with part one listing new entries with a removal date and part two with the full list dates of standards being removed. Part one includes the following new entries:

EN ISO 8849:2018 Small craft – Electrically operated direct-current bilge pumps (ISO 8849:2003) – Removal on the 9 June 2022
EN ISO 14946:2001 Small craft – Maximum load capacity EN ISO 14946:2001/AC:2005 – Removal on the 9 June 2022
EN ISO 8847:2017 Small craft – Steering gear – Cable over pulley systems – Removal on the 10 September 2023

Download details of the two annexes at **https://bit.ly/3Qikv9x**.

NEW POLL REVEALS TOP 10 WATERWAYS IN BRITAIN

A soaring aqueduct in North Wales, a three-and-a-half-mile canal tunnel in Yorkshire, and a 'stairway to heaven' flight of 21 locks in Warwickshire are among the top 10 waterways in Britain, according to a new poll voted for by Britain's boaters.

The top modern marvels were chosen by boaters and canal supporters to celebrate the renaissance of Britain's 200-year-old canal network. The poll was run by the Canal & River Trust charity which was launched in 2012 to take over the guardianship of the nation's waterways in the biggest ever transfer of publicly owned heritage into the charitable sector.

Some of the engineering masterpieces are well-known examples of the nation's industrial heritage and are joined by new additions, such as Little Venice in London and the longest staircase flight of locks in Britain at Foxton in Leicestershire. The poll reflects both the increasing importance and popularity of the waterways. Earlier in 2022, the Canal & River Trust's national boat count results revealed an increase in boaters using the canals across England and Wales over the last three years.

Photo credit Mike Schwarz

To find out what made the top 10 go to **https://bit.ly/3P68jaN**.

INLAND BOATBUILDING ASSOCIATION CODE OF PRACTICE UPDATED

British Marine chose the recent Crick Boat Show to release and publish the updated Inland Boatbuilding Association Code of Practice. The updated code brings in the changes to the national recreational craft regulations, a set of legal requirements that cover all recreational craft between 2.5m and 24m length, following the UK's exit from the European Union, along with new updated guidance on hybrid and electric propulsion installations.

Developed by British Marine and the Inland Boatbuilding Association in support of the canal boat industry, the Inland Boatbuilding Code of Practice provides a simplification of the national regulations, referencing not only the approved standards applicable to canal boats but also inland bylaws and historic industry best practice developed from the many years of experience held within the association.
The code is available to download from the British Marine website.

HARLAND & WOLFF WINS FIRST GOVERNMENT CONTRACT TO RESTORE MINE HUNTER

Photo credit: Ministry of Defence

Harland & Wolff has been awarded a £55 million ($65 million) contract to refurbish a former Royal Navy mine-hunting vessel, HMS Quorn, which will then be delivered in 2024 to the Lithuanian Government in a deal first announced in 2020. According to the UK's Ministry of Defence, the return to service of the vessel, which had been retired in 2017, will add to NATO's capabilities across Europe. HMS Quorn is the third mine-hunting vessel sold to Lithuania by the UK.

UK GOVERNMENT RELAXES REQUIREMENTS FOR RECERTIFICATION OF CE MARKED PRODUCTS

The UK government has announced a relaxation of the new requirements for UK Conformity Assessed (UKCA) marking that was due to come into force on the 1 January 2023.

The Department for Business, Energy & Industrial Strategy has announced that it is introducing the following additional measures to support businesses in adopting the UKCA marking requirements:

- It will reduce re-testing costs for UKCA certification, by allowing conformity assessment activities for CE marking completed by 31 December 2022 to be used by manufacturers as the basis for UKCA marking. This will reduce the immediate costs faced by manufacturers and will be valid until the expiry of their certificate or for 5 years (31 December 2027), whichever is sooner. This will reduce duplication and costs for businesses and by extension, consumers.
- It will make it clear that there is no need to re-test existing imported stock, as these products will be considered already placed on the market In Great Britain (GB). This will prevent the costly, and unnecessary re-labelling of existing stock for businesses.
- It will make it clear that spare parts that repair, replace or maintain goods already on the GB market can meet the same requirements that were in place at the time the original product or system was placed on the GB market. This will allow products and goods requiring spare parts to continue to be maintained.
- It will continue to allow businesses to affix the UKCA marking and to include importer information for products from EEA countries (and in some cases Switzerland), on an accompanying document or label until 31 December 2025. This will allow businesses to adjust their product design to accommodate marking changes at a convenient and cost-effective time.

However, despite the relaxation businesses will still need to be ready to start using UKCA marking before 1 January 2023.

JUBILEE SAILING TRUST CHARITY RAISES £675K

The Jubilee Sailing Trust has raised £675K as part of its Covid Recovery Campaign. The target is to reach £1.2m by the end of September.

The funds are required to pay the daily operational costs to allow the Trust's tall ship Tenacious (pictured) to continue sailing and delivering its mission, giving people of mixed abilities and circumstances the freedom to explore their ability and potential at sea.

The Trust issued a warning earlier in 2022 stating that it was close to closure due to the financial effects of the Covid-19 pandemic. A series of fundraising targets were set, the first of which - £500K – was met in May.

RECENT RESEARCH SHOWS WATERSPORTS PARTICIPATION IS ON THE RISE IN THE UK

According to the annual Watersports Participation Survey 2021, there has been significant growth in the number of people participating in watersports during the pandemic. The survey shows that some 12.7m UK adults tried a boating activity in 2021, with approximately 11.8m people taking part in one or more boating activities once or twice in 2021, remarkably almost double from the previous year.

RYA Director of Sport Development, Rob Clark, said, "During 2021, more than ever, leisure time was being spent outdoors and with the severe restrictions on international travel, lots of people headed to the coast to make the most of the good weather.

"Although the report tells us that the number of regular participants has remained almost static, we've seen boating organisations, marinas and retailers remaining busy during the pandemic as they accommodate newcomers to the sport."

Reflections and highlights from UK Maritime Safety Week

This year's Maritime Safety Week commenced on 4 July. Over the course of the week, a series of blogs reiterating safety messages to the industry were published by the MAIB. A few of the highlights are published below.

Andrew Moll OBE

Opening Maritime Safety Week, Chief Inspector of Marine Accidents, Andrew Moll OBE, said:
"Today marks the start of Maritime Safety Week 2022, an important moment when the marine industry comes together to focus on how we can collectively continue to improve safety across the sector. As the MAIB has done in previous years, this week we plan to highlight a number of key areas of ongoing concern and reiterate the safety messages that the industry must note.

"Today I am going to concentrate on fishing vessel safety, which continues to require my close attention. In 2021, ten commercial fishermen lost their lives and nine out of the 22 investigations commenced by MAIB last year involved commercial fishing vessels. However, we will not lose focus on improving safety and will continue to strive to understand the causes of accidents on board fishing vessels so lessons can be learned, and more tragedies can be averted in this most dangerous of professions.

"Stability on board fishing vessels is a significant ongoing safety issue. The recent reports looking into the tragic accidents on board the potting vessels Nicola Faith and Joanna C have highlighted how modifications can compromise a vessel's stability. However, stability can also be compromised during fishing operations by, for example, overloading, which was the case in the accident involving Nicola Faith. The vessel had undergone several unapproved modifications, but our investigation found that the main trigger for the capsize was severe overloading by a combination of catch and fishing gear. The consequence in this accident was that all three crew members lost their lives.

"At the start of Maritime Safety Week, I would encourage all skippers and crews to take a long hard look at their vessel's stability and ask themselves some potentially challenging questions. How much have modifications eroded our vessel's stability since it was built? Do we have a safe procedure for when the fishing gear becomes snagged or picks up a heavy load?

Are we using the fish hold to best effect to minimise the weight on deck? I would urge crews to take a look at the Nicola Faith and Joanna C reports and heed the lessons the investigations identified."

One small step for maritime safety – the issue of unsafe pilot ladders

The MAIB's Annual Report published in June highlighted the issue of unsafe pilot ladders, a concern that has been regularly voiced by the industry. In 2021, the branch received almost 200 reports about substandard pilot ladders. Of those, 87% of the ladders were rigged incorrectly and the remainder were observed by the marine pilot as being materially defective – see image. Fortunately, serious accidents have been rare, but the potential for injury and even loss of life clearly exists.

For more information go to the Code of Safe Working Practices for Merchant Seafarers (COSWP) guidance at: https://bit.ly/3r4nGpm

To mark this year's Maritime Safety Week, MAIB inspector Bill Evans has highlighted the key issues surrounding pilot ladders and his views on why they are so important.

Why is improving pilot ladder safety so important?
Marine pilots play a critical role in the safe operation of any harbour, where they guide almost every vessel in and out of the port. However, while the size and technological complexity of ships has increased, marine pilots still embark and disembark moving vessels by using a rope pilot ladder. The pilot transfer is a hazardous operation, so it is absolutely essential that these ladders are correctly rigged and their use properly supervised by the crew.

What are the things you should look out for when inspecting the safety of a pilot ladder?
The crew must inspect the pilot ladder before and after its use to verify that it is in good condition:

- ensure the ladder is in date by checking the maker's plate, normally found underneath one of the lower spreaders;
- inspect the ladder's side ropes to ensure that they are undamaged and in good condition;
- check the ladder's steps, making sure they are undamaged, clean, evenly spaced and horizontal;
- replace the ladder if there are any signs of damage, no matter how small. Someone's life may depend on it.

How do you rig a pilot ladder so it is safe?
To rig a pilot ladder correctly, it must be secured to strong points on the ship's deck by a rope stopper attached to the ladder's side ropes. Some of the reported incidents of substandard rigging have included the use of shackles or guardrails, which should never be used to secure the ladder. When a combination of accommodation and pilot ladder is being used, the lower platform of the accommodation ladder must be horizontal and secured to the ship's side so that the pilot can safely transition between the two. On some larger container vessels, a trapdoor arrangement is used, in which case the pilot ladder must extend above the platform to ensure that the marine pilot can safely transfer.

Finally, it is imperative that the pilot ladder is supervised by a qualified officer when in use, ready to take action if things go wrong.

Overall, what is the key advice you would give to someone who has a pilot ladder?
The three most important points are:

- inspect the pilot ladder before and after use;
- ensure it is well lit and rigged correctly;
- supervise its use, with a suitably qualified officer at the embarkation point who is in direct communication with the bridge and has lifesaving appliances close at hand, ready to respond if something goes wrong.

A reminder about mooring deck safety

A parted mooring line

MAIB took the opportunity during Maritime Safety Week to raise awareness of essential components for safer mooring operations.

Over the years, MAIB has seen many incidents where seafarers have been struck by mooring lines, unfortunately in some cases resulting in serious injury or death. Our Annual Report recently highlighted that such incidents continue to occur despite well published guidance on the subject. Even though there have been many advances in technology and automation in the shipping industry, mooring decks remain a place where people need to work in proximity to heavy lines under tension and interaction is unavoidable. Therefore, it is important that the safety guidance is followed. Below, we have emphasised three key components for safer mooring operations.

Equipment
Making sure the right equipment is used and then maintained in good condition is essential to keeping safe on mooring decks. Mooring lines need to be regularly inspected to make sure that wear and tear has not degraded the line, there are no hard spots on synthetic lines and no signs of contamination by oils and greases. The lead of each mooring line needs to be considered carefully to avoid placing additional stress on the lines or introducing chafe points. Inappropriate or poorly maintained equipment has previously contributed to incidents where lines have parted or released under tension and struck crew members, therefore meticulously checking equipment for anything untoward is critical for the safety of the crew.

Planning and Briefing
Planning is important when conducting any mooring deck operations. The risk assessment and control measures should be reviewed for each new operation and planning should take account of the expected mooring configuration, paying particular attention to the potential risk of snapback. Areas where mooring deck operations take place need to be kept tidy and mooring lines should be closely monitored on all berths – this is vitally important when there is a large range of tide. Planning effectively also involves making sure that all seafarers are adequately briefed on the mooring configurations, that they know what to do, and that they are positioned on parts of the deck that are less dangerous. Enough crew should be on deck to conduct the job safely, but too many crew should be avoided as it can unnecessarily place others at risk.

Communication
Finally, crew communication is of the utmost importance when working on mooring decks, because it has the potential to be extremely hazardous if people are not able to interact clearly. Everybody involved in an operation needs to communicate effectively, but must also consider the number of circuits in use: too many voices on the same circuit can cause confusion and risk over-talking; however, using separate circuits can leave some crew in the dark. Ultimately, effective communication can be the difference between being safe and putting people at risk, therefore it is important that the mooring plan ensures that good communications can be maintained between all parties involved in the mooring operation.

MAIB reports on two fatal accidents on fishing vessels published

A few weeks ago, the UK Marine Accident Investigation Branch (MAIB) published two reports within 24 hours of each other. Both reports related to fishing vessels which had capsized leading to the loss of 5 lives. Both reports seem to bear a remarkable similarity about modifications made to the vessels which ultimately caused the accidents to occur. These cases affecting fishing vessels are certainly not the first by any means to hit the news headlines. This is yet another wake up call for the fishing industry and those involved in inspecting such vessels to heed.

Case 1

Capsize and sinking of whelk potter Nicola Faith with loss of 3 lives

Whelk potter Nicola Faith

On 27 January 2021, the whelk potter Nicola Faith capsized and sank 1.9 miles north of Rhos-on-Sea, North Wales with the loss of its three crew members. The vessel had been extensively modified during its life which had significantly reduced its margin of positive stability. On the day of the accident the Nicola Faith had been loaded with catch and retrieved strings of pots to the point of instability, which resulted in the capsize and subsequently sinking of the vessel. Nicola Faith had not been fitted with a mandatory emergency beacon to alert to the capsize, and it was not reported as overdue until 1000 the next day. Following its salvage by the MAIB, a thorough inspection of the vessel was carried out to determine possible modes of capsize and a full assessment of its stability was undertaken.

Safety issues

- Nicola Faith was operated in an unsafe manner and was loaded with a combination of catch and retrieved fishing gear to the point of instability
- a mandatory Emergency Position Indicating Radio Beacon (EPIRB) was not fitted to the vessel and the crew were not equipped with personal locator beacons
- Nicola Faith was found to have been extensively modified; these modifications had eroded its margin of positive stability
- Maritime and Coastguard Agency surveyors had noted some of the modifications, however, the guidance concerning modifications that would have triggered a stability assessment was not sufficiently clear
- although available on board, the crew did not routinely wear personal flotation devices

Recommendations

Recommendations have been made to the Maritime and Coastguard Agency to (2022/125) amend the Code of Practice for the Safety of Small Fishing Vessels of less than 15m Length Overall, to revise the wording and refer to a load limit rather than a catch limit, and to (2022/126) review and enhance the guidance to surveyors to clarify what level of modification should trigger further investigation into a vessel's stability.

A recommendation (2022/127) has also been made to Nicola Faith's registered owner, The Big Ship Limited, to ensure that a written agreement is in place to clearly identify the organisation or person responsible for the operation of any vessels it may own.

Download the full report at **https://bit.ly/3HMDaX8**.

The ill-fated Joanna C

Case 2
Fatal capsize and sinking of scallop dredger Joanna C

Early in the morning on 21 November 2020, the scallop dredger Joanna C capsized south of Newhaven, England; only one of the three crew survived. Joanna C's crew was hauling the gear when they noticed that the starboard dredge bar had become snagged on a line of whelk pots. The snag caused a heel to starboard from which the vessel could not recover, and it capsized rapidly.

The MAIB's investigation found that through-life modifications, culminating in extensive alterations in 2019, had reduced Joanna C's previously good stability to a state where it had very low reserves of positive stability and increased vulnerability to capsize. The detrimental effect of the modifications was unknown to the crew and regulator alike because, although a stability assessment had begun after the 2019 modifications, the analysis was never completed, and the vessel was free to continue operation.

During the capsize Joanna C's mate was thrown into the water and the skipper later managed to escape as the inverted vessel sank; however, the deckhand remained trapped inside. The vessel's liferaft did not inflate during the accident because the uninflated liferaft had insufficient buoyancy to initiate the inflation mechanism. The absence of a liferaft adversely affected the survivability of the crew in the sea after the vessel sank.

Safety issues

Reserves of stability are critical to allow fishing vessels to operate safely and ensure recovery back to upright from a heel induced by the environmental conditions or a snagging. Joanna C's very low margin of positive stability left the vessel extremely vulnerable to capsize.

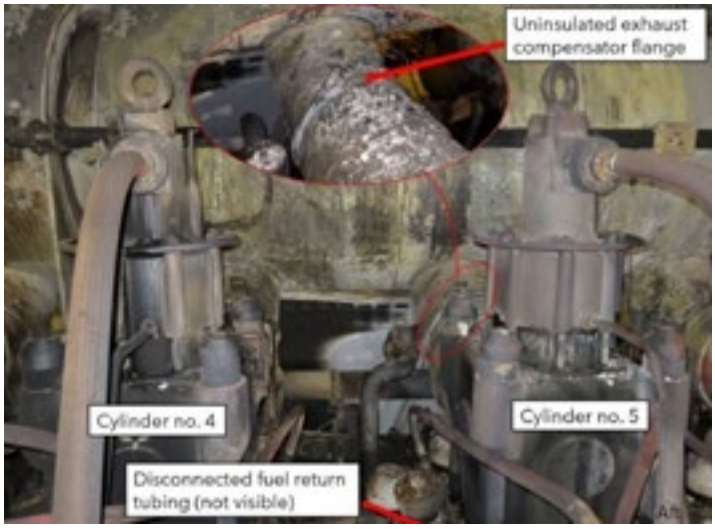
Liferafts fitted for 'float-free' operation must have sufficient buoyancy in the uninflated state to activate the inflation mechanism. Although a buoyancy standard existed for larger SOLAS liferafts there was no corresponding requirement for smaller, non-SOLAS liferafts such as those fitted to fishing vessels.

Recommendations

A safety recommendation (2022/124) has been made to the Maritime and Coastguard Agency to ensure that stability requirements for small fishing vessels are applied as intended and that, where stability checks are required, fishing operations should be suspended until a vessel has been satisfactorily assessed.

During the investigation a safety recommendation (2021/116) was made to the British Standards Institution to propose the introduction of a minimum buoyancy requirement for liferafts certified by the International Organization for Standardization. The International Organization for Standardization's technical committee subsequently agreed to include a buoyancy requirement in its revised liferaft standard.

Download the full report at **https://bit.ly/3ygDFWc**.



CREW INSUFFICIENTLY SWAGING COMPRESSION FITTING FERRULE LED TO CONTAINERSHIP FIRE IS INVESTIGATION FINDING

The National Transportation Safety Board (NTSB) has published its report on the engine room fire aboard the containership President Eisenhower, that took place on April 28, 2021, off California.

The engine room and machinery on board the President Eisenhower were automated, controlled, and monitored such that the machinery spaces could be unattended. The ship's engineers typically worked in and monitored the machinery spaces during the day, and the engine room and machinery spaces were unattended at night. At 0053, the second engineer and first engineer departed the ECR for the accommodation spaces above. The engine room and machinery spaces were put into an "unattended" status with alarms configured to sound on the bridge, in common areas, and in the second engineer's cabin (because the second engineer was the designated duty engineer on watch). Additionally, the President Eisenhower had a closed-circuit television (CCTV) system, with the majority of the system's video cameras located in the machinery spaces. The crew used desktop computer stations to view the spaces but did not continually monitor them.

Additional detectors were triggered within the engine room, and the vessel's general alarm automatically activated. Using the CCTV monitor on the bridge, the captain and third mate confirmed that there was an engine room fire. En route to his emergency muster station in the portside safety storeroom, AB1 verbally alerted crewmembers that were off duty in their cabins of the fire in the engine room.

Lessons Learned...

1 Rapid Oil Leak Detection

Rapid oil leak-detection systems are a valuable tool that can be used to prevent fire in machinery spaces. Video analytic technology is designed to use standard CCTV video to detect fuel mist and spray in real time and alert the crew before any ignition and fire. This technology is supported by class societies as an acceptable method for identifying leaks and can be integrated with existing CCTV systems. Had this technology been in use aboard the President Eisenhower, the spraying fuel oil may have been detected well before the fire developed.

2 Containing Engine Room Fires

The crew of the President Eisenhower effectively contained the spread of a main engine room fire by removing fuel and oxygen sources, cooling boundaries, and communicating effectively. These efforts show the importance of realistic scenario-based training, including engine room emergencies, which involve shutting down machinery, fuel oil, lube oil, and ventilation systems, as well as boundary monitoring, to quickly contain and suppress engine room fires, which can spread to other spaces and/or cause a loss of propulsion and electrical power.

Download the full report at **https://bit.ly/3ySFmd2**.

LUXURY YACHT FIRE MOST LIKELY CAUSED BY ELECTRICAL FAULT SAYS NTSB REPORT

The fire that destroyed a luxury yacht near Key West in March 2021 most likely started from an electric source within the sound enclosure for the vessel's starboard generators, the National Transportation Safety Board (NTSB) report has determined. However, due to the extent of the fire damage, investigators were unable to conclusively determine the source of the fire.

REPORT bites

DNV has awarded the Norwegian technology provider HAV Group ASA preliminary approval for its hydrogen-based energy system.

MDL Marinas' Hamble Point Marina is adding new yacht building tenants to its existing marine manufacturing repertoire.

The Port of Valencia has begun the installation of the hydrogen generator with the assembly on the north quay of the tank and compressor of the station that will supply hydrogen to the machinery that forms part of the H2Ports project.

HMM Co Ltd, South Korea's largest container shipping company by sales has said it plans to invest 15 trillion won ($11.46 billion) over the next five years to sharply increase its capacity.

New Zealand's Ports of Auckland has welcomed the world's first full size, ship-handling electric tugboat, named Sparky.

Pembrokeshire Coastal Forum, the legal entity behind Marine Energy Test Area project, has named Jetske Germing as its new managing director.

Swiss engine developer WinGD and Engine Machinery Division of the South Korean shipbuilder Hyundai Heavy Industries have decided to collaborate on delivering the first WinGD engine capable of running on ammonia.

Families of the victims of Beirut port's blast have filed a $250 million lawsuit against an American-Norwegian firm suspected of bringing explosive materials to the port.

Members of the $689-billion outdoor recreation industry have established a blue-ribbon commission to stop and reverse the spread of aquatic invasive species in the U.S.

IMO reports that the agreement to establish the International Maritime Research Board (IMRB) and the proposed $5 billion International Maritime Research Fund (IMRF) was not achieved at MEPC 78.

Explora Journeys and Italian shipbuilder Fincantieri have signed a memorandum of agreement for the construction of an additional two hydrogen-powered cruise ships.

Sustainable Marine has officially powered up its next-gen floating tidal energy platform PLAT-I in Nova Scotia, making it the first to deliver in-stream tidal power to the grid in Canada.

After using flax to build a small trimaran in 2013, Roland 'Bilou' Jourdain has now extended the concept to partially build a 60ft Outremer 5X.

Safety Briefings

The crew unsuccessfully attempted to extinguish the fire and abandoned along with two passengers using the vessel's tender boat. They were then picked by two U.S. Coast Guard boats without injury. The fire, however, resulted in the total loss of the $3.9 million yacht which sank a day later. An unknown quantity of diesel fuel oil was released, causing a small sheen.

The vessel was chartered for hire four to six times a year, including at the time of the casualty. Under the Cayman Islands Shipping Registry, a vessel certified for commercial use of La Dolce Vita size would have been required to meet the UK Large Commercial Yacht Code (LY2) requirements for commercial use yachts. But investigators found the La Dolce Vita did not meet LY2 requirements, including having a way to remotely stop the engine room's intake and exhaust fans and the capability to close off natural ventilation to the space. Contributing to the severity of the fire and total loss of the vessel was the inability to secure ventilation to the engine room, which reduced the effectiveness of the yacht's fire extinguishing system and allowed the fire to spread beyond the engine room.

Read the full report at **https://bit.ly/3RwSAU7**.

CHECK THAT ALL EQUIPMENT PARTS ARE MOVABLE AND OPERATIONAL AFTER MAINTENANCE PROCESS

International Marine Contractors Association (IMCA) has published details of two incidents in which something went wrong owing to failures in the maintenance process. There were no reported injuries in either incident.

The first incident relates to the lowering of a lifeboat when a small shackle broke. The shackle held the upper sheave guiding the brake release wire, resulting in the sheave falling down on top of the lower sheave. This caused the brake handle not to fall into brake position with the consequence that the lifeboat did not stop lowering but kept on going down.

In the second incident, the main hoist hook block overshot the highest position alarm and ran into the sheaves from the main runner under the jib. The jib was lifted by the force of the main runner and the crane stopped automatically when the slack wire alarm of the topping wire was activated.

Probable cause
Investigation showed that one of the runner sheaves underneath the jib was bent slightly and unable to move freely. During the inspection of the high hook alarm, it was discovered that the flat bar in front of the sensor was not moving. It was stuck in place because of dry paint from maintenance that morning. The crane operator did not pay sufficient attention when working near the limits of the crane, not looking up to the hook.

Lessons learned
In light of these incidents, IMCA has said that the following actions have been in order to ensure that similar situation will not happen in the future:

- The damaged sheave was reshaped. Thorough examination of the sheave surface and inspection by means of dye penetration testing showed that there were no cracks;
- Ensure close monitoring the crane movements after each order given and when working near any of the crane limits;
- Test alarms after maintenance on the crane;
- After maintenance process/painting check that all equipment parts are still movable and fully operational.

VISUALLY INSPECTING LIFEBOAT PRIOR TO TESTING CRUCIAL

The US Coast Guard (USCG) has addressed the importance of visually inspecting lifeboat and davit installations prior to testing with crewmembers onboard, and ensuring crew familiarity with company policy related to lifesaving equipment testing. As USCG said, the remote control wire may be overlooked, yet weaknesses within the linkages or poor spooling of the wire itself can lead to catastrophic failures in the lifeboat launching systems.

In fact, during a recent U.S. deep draft container ship inspection, a vessel's crew was lowering the lifeboat when the remote control wire arrangement caused two separate failures:

- The first occurred when the remote control wire parted as the lifeboat was being lowered to the waterline with crew on board. Causal factors included poor winch spooling potentially hidden under the outer spools, which led to a wire kink and winding on itself, creating enough force to part the wire.

- The second occurred a day later after the replacement remote control wire was hand spooled from extra wire found on board. While testing with crew on board using the remote control wire to lift the brake, an unexpected payout of wire led to the winch brake prematurely engaging, which made the lifeboat stop lowering and swing erratically above the embarkation deck. Seconds later, the movement caused the wire to regain tension, which lifted the winch brake arm and caused the lifeboat to lower again. While lowering in a swinging motion, the skeg of the lifeboat caught on the knife-edge of the ship's deck, causing the lifeboat to list more than 90 degrees. Without the quick action of a crewmember who activated the winch brake lever from the deck, the lifeboat could have inverted further and led to catastrophic outcomes.

USCG strongly recommends that ship's crew are visually inspecting lifeboat launching systems and test lowering thoroughly prior to operation with crew on board, paying special attention to the following inspection points:

- Verify the proper spooling of the remote control wire, expand inspection as necessary.
- Verify the proper position of the remote control wire weight. If the weight is very close to the top of the lifeboat, this may indicate the remote control wire is too long.
- Verify material condition of the shackle that connects the pull cable to the remote control wire within the lifeboat. These steel shackles can corrode in the elements and maybe overlooked during weekly/monthly/annual inspections.

KEEL FAILURE RESULTS IN CAPSIZE

The crew of the first Farr X2 have been rescued after the boat lost its keel on an overnight offshore qualifier. Nexba Racing, a new 30ft grand prix racer aimed at the short-handed market, was sailing in a 100nm qualifier off the coast of New South Wales, Australia in a light to moderate breeze and 1-2m seas when the keel attachment failed resulting in the boat capsizing. The two female crew were rescued after spending 15 hours drifting. The 9.2-metre boat is the latest project from Farr Yacht Design. She was built in Singapore by XSP and launched in May.

"We take the safety of all the crews who sail on boats of our design very seriously and our design team is working with the builders, component suppliers and the composite structural engineers of to identify the root cause and to implement any necessary design, material or build process changes required to insure this cannot happen again," said Farr in a statement.

And the boatbuilder said further information will be provided after a review of all available information has been carried out. At least eight Farr X2s have been sold.

REPORT bites

Scotland's Kip Marina has been awarded 5 Gold Anchors from The Yacht Harbour Association's marina quality assurance scheme.

Western Marine Electronics, Arcturus Marine Systems, and SmartCatch are to be amalgamated and rebranded as INOV8V Marine Group.

Three days after a fire at Podickory Point marina on Chesapeake Bay's western shore destroyed two boats and damaged three more, a large fire broke out at Great Oak Landing marina on the eastern shore on board a motor boat.

The UK explorer yacht and adventure craft brand Arksen is expanding its vessel purchase options by now being able to accept all major cryptocurrencies for payment, alongside standard marine financing options.

Aqueduct Marina has filled its first boat with hydrotreated vegetable oil (HVO), a greener alternative to traditional diesel.

Improvements in batteries have unlocked the potential to electrify big containerships today on voyages of up to 5,000 km, a new study shows.

A.P. Moller-Maersk has withdrawn its board member from industry organization International Chamber of Shipping, partly over the trade association's stance on climate change, according to the company's website.

Pains Wessex, a UK-based producer of pyrotechnic marine rescue distress signals, says it has received over 3,500 expired pyrotechnics during its recent flare amnesty days.

Riva, a Ferretti Group brand, has released a new advert starring a trio of famous faces to celebrate its 180th anniversary, including British football icon David Beckham.

Canada has published a bulletin to describe vessel requirements for the Protection of the Killer Whale (Orcinus orca) in the Waters of Southern British Columbia which came into force on 1 June 2022.

The National Marine Manufacturers Association reports new powerboat sales in Q1 2022 are showing signs of normalising following two years of historic growth.

Greek ferry operator Saronic Ferries has selected the Netherlands-based C-Job Naval Architects to develop the design of the first fully electric roll-on/roll-off passenger ferry in Greece.

UK government's Department for Bussiness, Energy & Industrial Strategy announced the appointment of Jane Toogood as the country's first 'Hydrogen Champion'.

Safety Briefings

SERIOUS VIOLATIONS LED TO BOATYARD FIRE THAT DESTROYED SUPERYACHT SAYS REPORT

The company operating Hinckley Yacht Services (Portsmouth, US) has been fined by the Occupational Safety and Health Administration (OSHA) after a massive fire in December that destroyed a superyacht and a second boat on the property. The initial fines totalled more than $56,000, but these have since been reduced to around $31,000.

OSHA says employees were exposed to fire hazards while working in an enclosed work area. That enclosed area was under the hull of a boat surrounded by hay bales stacked three-high, and the employees had not been provided with effective information and training on the hazardous chemicals they were using (flammable liquids, which ultimately ignited).

Seventy firefighters fought the blaze after workers, making repairs on the hull of a superyacht, accidentally started the fire. Both vessels were total losses and damages were also incurred to some surrounding equipment, including a 200-ton lift, reports the Newport Daily News.

OSHA lists serious violations, including:

- The employer did not review the emergency action plan with each employee when the employee was assigned initially to a job.
- In locations where flammable vapours may be present, precautions were not taken to prevent ignition by eliminating or controlling sources of ignition.
- Ground areas around buildings and unit operating areas were not kept free of weeds, trash, and/or other unnecessary combustible materials.
- The employer did not provide a medical evaluation to determine the employee's ability to use a respirator, nor were employee(s) using tight-fitting facepiece respirators fit-tested prior to initial use of the respirator.
- Employees were not provided effective information and training on hazardous chemicals in their work area.

SAFE FITTING AND REMOVING OF TEMPORARY LASHING POINTS RECOMMENDATIONS

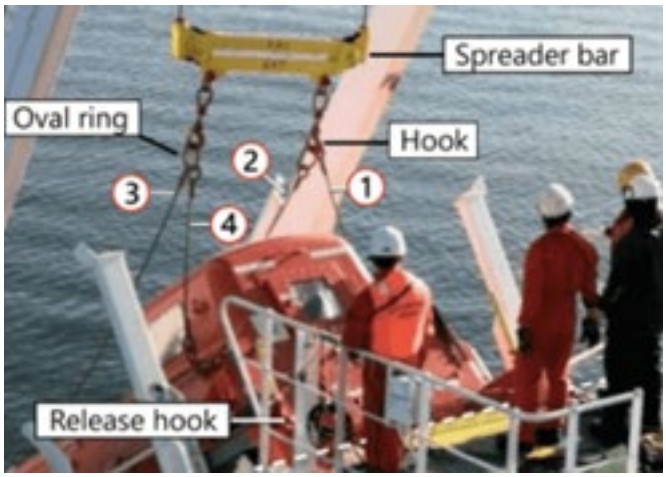
Mark Dunbar, Surveys Manager at West P&I Club, has provided recommendations on fitting and removal of temporary lashing points after the club noticed receiving a number of high value claims arising from such operations.

According to Mr. Dunbar, it is sometimes required in the dry cargo trades for fixed lashing points to be temporarily fitted for securing of cargo and then removed at the end of the voyage.

He said, "From cases we have reviewed, toolbox talks had been conducted and hot work permits issued, yet the Club has still experienced a number of high value claims arising from these operations."

More specifically, in some recent cases, hot slag/sparks have dropped into cargo holds and set fire to packaging or tarpaulins covering the cargo below. In addition to the direct fire damage, further damage to cargo has occurred due to water damage from subsequent firefighting operations."

"In another instance, where there was a mixed stow in one hold, bulk cargo in an adjacent hold decomposed due to heat transfer where temporary lashing points were being fitted to a transverse bulkhead for securing of general cargo. What is more, in some cases, no fire watch had been arranged due to a lack of awareness that heat/sparks/slag can propagate through steel plating separating the point of work and cargo hold."



ANOTHER SERIOUS LIFEBOAT ACCIDENT ILLUSTRATES CONTINUED RISK IN DRILLS

Canada's Transportation Safety Board (TSB) has released a report on yet another serious lifeboat-drill accident, illustrating the continuing hazards of this routine SOLAS safety exercise. A failure of a lifeboat launch system on a merchant vessel can result in a fall from height, ending in injuries or fatalities.

On December 1, 2020, the crew of the bulk carrier Blue Bosporus were carrying out a free-fall lifeboat drill at anchor in English Bay, British Columbia. After the four wire rope slings for lowering away the free-fall lifeboat were attached, the third mate and an AB went aboard the boat to conduct a test launch. The third mate activated the release hook, and the lifeboat slid forward about 25 centimetres. At that point, three slings connecting the boat to the davit failed, along with the bracket connecting to the fourth sling. The boat fell 45 feet into the water.

Both crewmembers aboard were seriously injured – one with leg injuries and one with an injured hand. The boat's hull sustained damage where it struck the water. Most (but not all) of the broken sling components were retrieved for analysis.

A post-accident investigation found that the crimp sleeves on the slings had weakened over time due to stress corrosion cracking – a common problem for stainless steel. In addition, one of the slings was shorter than the others, meaning that it took the full load of the boat when the hook was initially released. This sling failed first, followed by the others in sequence.

The vessel's maintenance schedule did not specifically cover inspecting the condition of the slings, according to TSB. After the casualty, the shipowner installed new load-tested sling assemblies and brackets, and it sent a safety circular to update its requirements for lifeboat inspections and drills.

REPORT bites

MAN PrimeServ has started offering a service of preparing older engines for future, climate-neutral operation.

Polish shipyard, Sunreef Yachts, is to open its first overseas facility outside of Europe in UAE to cope with rising demand.

Ellen, the world's longest-ranging fully electric ferry, set a new world record on 9 June in Sønderborg, Denmark, during the International Energy Agency (IEA) 7th Annual Global Conference on Energy Efficiency.

Berge Bulk, BAR Technologies, and Yara Marine Technologies have reached an agreement to install four BAR Tech WindWings by Yara Marine Technologies on board the 210 DWT bulk carrier Berge Olympus.

The Panama Ship Registry has added the Ever Alot to its fleet and now holds 18 of the world's 20 largest container ships in terms of TEU.

UK-based Artemis Technologies has launched to market the world's first commercially viable 100% electric, high-speed foiling workboat range.

Torridge District Council in the UK has voted to support a funding bid, seeking approximately £15 million ($18 million) to create the Appledore Clean Maritime Innovation Centre in northern Devon.

In cooperation with recycling centre Leviathan GmbH, shipyard German Naval Yards has welcomed the first ship that is to be recycled 100% sustainably for the first time.

Monaco Yacht Show has revealed that a new Sustainability Hub is being launched at this year's event, which is set to take place from 28th September to 1st October 2022.

L.J Commercial Services have developed a groundbreaking new digital log book solution for superyachts, providing a more sustainable alternative to traditional paper log books.

New figures released by the RNLI show a worrying rise in callouts involving stand-up paddleboards since 2020, as the popularity of paddleboarding continues to rise in the UK.

Netherlands based Acta Marine has signed a contract for the construction of two next-generation, Methanol MDO/HVO powered DP2 Construction Service Operating Vessels (CSOVs).

ExoTechnologies says its first commercial vessel is being delivered to Police Scotland, built from its fully recyclable Danu composite material technology.

Safety Briefings

WEST P&I HAS NOTICED AN INCREASE IN FIRE INCIDENTS TO CONTAINERS CONTAINING CHARCOAL AND CARBON

The West P&I Club has noted a number of recent container fire incidents related to containers which were declared as miscellaneous items but actually contained charcoal/carbon. This is a commodity liable to spontaneous combustion. These containers were below deck and when fires broke out there was considerable damage caused to the vessel and other cargo by the fire and the water used to extinguish the fire.

The vessels' CO2 system assisted in putting the fires out. Fire experts have also advised that they are aware of numerous other fires in containers of charcoal tablets in recent months. The fires have been caused by containers said to contain "tablets for water pipe" and "hookah accessories", which are not listed within the IMDG Code, but are actually a form of charcoal/carbon, which is listed in the International Maritime Dangerous Goods (IMDG) Code as hazardous cargo.

Charcoal is also used in tablet form for water-pipes used for smoking, including Nargila, Shisha or Hookah pipes. This type of charcoal may be manufactured with some flammable solid inside, resulting in lower ignition temperature.

If charcoal/carbon is declared as non-hazardous, then a certificate must be provided by the shipper advising that correct sampling has been performed and it has passed a self-heating test from a laboratory approved by the Competent Authority said the West P&I Club, adding that in the cases it has experienced, the cargo has no declaration other than tablets for water pipe, and/or hookah accessories.

There is no indication on the bills of lading and the cargo manifest that the cargo is charcoal/carbon or whether is a hazardous cargo. This may constitute a misdeclaration and attract liability to the shippers and/or charterers of the vessel when liner bills of lading are issued.

Charcoal/carbon is a black residue, consisting of carbon and any remaining ash obtained by removing water and other volatile constituents from animal and vegetation substances. It is a self-heating substance – that is to say, a product which, in contact with air and without an energy supply, is liable to self-heating. Such a self-heating reaction may result in extensive heat development and fire.

BULK CARRIER CASUALTY REPORT 2012-2021 PUBLISHED BY INTERCARGO

INTERCARGO has published its Bulk Carrier Casualty Report 2012-2021. It reports that 27 bulk carriers of over 10,000 dwt were declared as total losses for the years 2012-2021.

According to INTERCARGO, bulkers losses took place as follows:

10,000-34,999 dwt: Six bulk carriers were lost, representing 22.2% of the total.

35,000 – 49,000 dwt: Five bulk carriers were lost, representing 16.3% of the total, with one loss related to suspected cargo liquefaction.

50,000- 59,000 dwt: Seven vessels were lost, representing 25.9% of the total, with the loss of 55 lives, accounting to 59.8%. Four of the casualties, were related to suspected cargo liquefaction.

The lowest number of casualties was in the 60,000 – 79,000 dwt range, representing 7.4% of the total.

80,000+ dwt: Losses of one Newcastlemax and one VLOC brought attention back to larger bulk carrier safety. The seven losses, or 25.9% of the total 27 casualties reported cost 22 lives, or 23.9% of the total 90 lives lost during the period.

Read the full report at **https://bit.ly/3InJ8xQ**.

KEY TIPS FOR THE SAFE CARRIAGE OF ALTERNATIVE FUEL VEHICLES IN RO-RO SPACES PUBLISHED BY EMSA

The main reasons behind the topic of alternative fuel vehicles becoming a serious safety concern are the enormous growth of the alternative fuel vehicles fleet, the potential fire risks of these vehicles and a high uncertainty on the associated fire characteristics, EMSA notes and issued in response a guide providing recommendations for the safe carriage of alternative fuel vehicles onboard ships.

In the guide, EMSA highlights that risk assessment should be conducted for each ship to ensure that risks arising from the carriage of the AFVs that might affect persons onboard, the environment, the safety of the ship are addressed.

These risks should be managed within the framework of existing requirements in the ISM code. Consideration should be given to the hazards arising from transporting alternative fuel vehicles and all related operations should be risk evaluated. The result of the risk assessment should be a ship specific procedure to be carried onboard for the prevention and mitigation of fire incidents involving alternative fuel vehicles.

Alternative fuel vehicles should only be allowed onboard if they comply with the provisions of the IMDG Code. Particular attention should be paid to the following: if there is suspicion that the battery of EVs is damaged or their battery is defective, they should only be allowed if their battery is removed; are free from any leakages of fuel/gases.

Read the guidance in full at **https://bit.ly/3nPPRqU**.

REPORT bites

Volvo Penta has expanded its marine IMO Tier III range with new D13 solutions.

The UK Government released its Wellbeing at Sea Tool alongside a report into seafarer suicide and mental health.

Outgoing Nautical Institute President Ms Carson-Jackson, commented on the women participation in shipping, noting that it still remains very low. «Here we are nearly forty years later in 2022 and still we are at 2%,» she said.

Japanese shipping company Mitsui O.S.K. Lines and compatriot manufacturer Miura have developed a new centrifugal-type microplastic collection device, which can continuously collect microplastic while a vessel is underway.

The United States of America has officially joined the Clean Seas Campaign, demonstrating their commitment to ending plastic pollution.

SINTEF, a Norway-based independent research organisation, has designed "the world's first electric speedboat" as part of a European research project aimed at creating an emission-free boat.

The Sustainable Energy Authority of Ireland, together with the country's national ocean test centre Lir NOTF, is again offering free-of-charge access to the research and testing facilities for offshore renewable energy developers.

Safety Briefings

MARSHALL ISLANDS INVESTIGATION INTO CARGO FUMIGATION INCIDENTS LAUNCHED

The Republic of the Marshall Islands Maritime Administrator is conducting marine safety investigations following two different incidents involving in transit cargo fumigation.

One of these incidents resulted in the death of a crewmember soon after removing fumigant from the cargo holds prior to arrival at the discharge port. The other resulted in the hospitalization of a stevedore after being exposed to fumigant that had been applied by the crew prior to departure from the loading port.

The Administrator's investigations of these two cargo fumigation incidents have identified that crewmembers on board both ships were required to handle fumigant because of COVID-19 related restrictions imposed by the port State's public health authorities.

These restrictions prohibited qualified shore personnel from going aboard the ship to either remove the fumigant residues from the cargo holds following the vessel's arrival or to apply the fumigant after the cargo had been loaded.

Fumigation of dry bulk cargo requires introducing a toxic gas, or a material that reacts with moisture in the air to produce a toxic gas, into a ship's cargo holds. Exposure to fumigant gases can lead to severe injury or death says Marshall Islands, adding that "it is essential that all appropriate precautions be taken to ensure the safety of the ship's crew and any other persons (e.g., cargo surveyors, customs agents, stevedores, etc.) who might be on board during all stages of cargo fumigation."

Member News

RECENT NEW IIMS MEMBERS

Full members

Sergio Adrian Garcia	*MIIMS*	Argentina
Paul Madeley	*MIIMS*	Spain
Anna Louise Orchard	*MIIMS*	BVI
Andrea Pawlotzki	*MIIMS*	France

Associate members

Leo Curin	*AssocIIMS*	Croatia
Karen Soh Wai Han	*AssocIIMS*	Singapore
Kenneth Hodgins	*AssocIIMS*	St Thomas
Abhishek Pathak	*AssocIIMS*	India
Erick Edgardo Sanchez Salazar	*AssocIIMS*	UK
Godze Turan Sari	*AssocIIMS*	Turkey

Affiliate members

Senol Acar	*AffiliIIMS*	Turkey
Okonyon Osayande Harrison	*AffiliIIMS*	Nigeria
Devram Jhoree	*AffiliIIMS*	Mauritius
Noel McGettigan	*AffiliIIMS*	Ireland
Neill Graeme Pearce	*AffiliIIMS*	UK
Cameron Springthorpe	*AffiliIIMS*	UK

Graduate members

Iwuchukwu Ifeanyi Jonathan	*GradIIMS*	Nigeria
Guido Morlachetti	*GradIIMS*	Argentina
Michael Wills	*GradIIMS*	Canada

IIMS congratulates Iwuchukwu Ifeanyi Jonathan and Guido Morlachetti for completing their studies in the
IIMS Professional Qualification in Commercial Ship Marine Surveying

IIMS congratulates Michael Wills for completing his studies in the
IIMS Professional Qualification in Yacht and Small Craft Marine Surveying

TIME FOR TRANSPARENCY ABOUT ACCIDENTS

*By **Peter Broad** FIIMS, IIMS President*

It is with interest that I read 'Grey Matter' in the IMarEST 'Marine Professional' publication issue1/2022.

In Michael Grey's one page article he has highlighted **'Time for transparency about accidents'**.

Michael is quoting the InterManager's secretary general Captain Kuba Symanski by asking *'the very plain question as to why "sub-standard equipment that kills people" continues to be in production and installed on ships.'*

I would like IIMS members and readers of this Report Magazine to consider this statement.

I think, in reality, most safety equipment is built to the required standards of SOLAS or European 'Wheel Mark'. This is irrespective of whether the equipment is built in Europe or built in Asia for installation on board new vessels.

For international trading commercial vessels Classed with an IACS member it is a requirement that the safety equipment is designed fit for purpose, installed on board under survey, and tested by an attending class surveyor before the vessel can receive the 'Cargo Ship Safety Certificate' and the associated 'Record of Equipment for Cargo Ship Safety'. Then the ISM Certificate, 'shall' require the Owner or Technical Managers to provide meaningful onboard training and familiarization for their crews in all aspects of the ship's operations, and especially the Safety Equipment.

So, if this is the procedure for the certification of equipment through the supply chain that is then installed correctly onboard and tested and shown to operate correctly at the time a vessel is delivered (new), how and why do these accidents keep happening?

Accidents may happen because of equipment failure, but equipment failure happens because of:

- Lack of planned maintenance onboard;
- Poor onboard maintenance management;
- Lack of maintenance budgets;
- Lack of onboard crew training and familiarization with the equipment;
- Lack of crew experience;
- Lack of crew training;
- Lack of control and management from the owners or technical managers head office.

As professional marine surveyors we must all observe different aspects of ships operations, but in the cases of a hull and machinery claim or, accident investigation, we should always try to consider 'why' something has happened. The root cause is not often easy to establish, but perhaps there is a common theme – 'lack of leadership', 'lack of experience', lack of maintenance', or all of these?

So, in summing up, it is generally not considered fair or reasonable to 'blame' the "sub-standard equipment that kills people". The equipment was probably not sub-standard by design, but became, or has become sub-standard by external factors that have influenced its deterioration to a point of failure. This is what causes fatalities.

Round up following publication of a few reports

Here is the Report Magazine guide to a wide selection of recently published reports.

EMSA gives first factual analysis of maritime safety landscape in the EU

The European maritime safety framework has evolved to become one of the most robust in the world. That's according to the European Maritime Safety Report, the first ever comprehensive overview of maritime safety in the European Union.

Download the 283 page report at **https://bit.ly/3bgsFiP**.

Annual Digest of reports and insight articles 2021 published by CHIRP

CHIRP Maritime has published its seventh annual Digest of CHIRP Maritime reports, covering all the cases it published during 2021 as well as several in-depth articles specially commissioned to highlight important safety topics.

Download the 63 page report at **https://bit.ly/3J1i6wO**.

New guide launched to help improve welfare standards on fishing vessels

Two maritime charities have joined forces to help improve welfare standards on fishing vessels with the launch of a new guide entitled 'Work in Fishing Convention (C188): Everything you need to know but were frightened to ask', following some reports of labour exploitation that have plunged the sector into disrepute.

Download the 40 page guide at **https://bit.ly/3Bfnr1u**.

MCA publishes new business plan

Maritime & Coastguard Agency

Passenger and fishing safety, new technologies and a greener future are the top priorities for the Maritime and Coastguard Agency (MCA) for the coming year. Reducing the numbers of deaths in the fishing industry, keeping people safe on-board ships, and continuing to drive forward greener maritime are all featured in the MCA Business Plan for 2022/23.

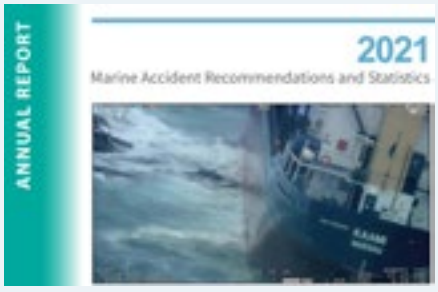
Download the 20 page Business Plan at **https://bit.ly/3vefC8A**.

US Coast Guard publishes its 2021 Flag State Control Domestic Annual Report

The US Coast Guard (USCG) has published its 2021 Flag State Control Domestic Annual Report. This report highlights U.S. domestic fleet deficiencies, inspection, and marine casualty statistics.

Download the 34 page report at **https://bit.ly/3zwkys4**.

MAIB Annual Report 2021 published



The Marine Accident Investigation Branch (MAIB) has published its 2021 annual report. One of the main findings to note is the number of fatalities in the fishing vessel fleet, which hit a 20-year high.

Download the 77 page report at **https://bit.ly/3veEgFZ**.

Sea Cargo Charter annual disclosure report 2022

The Sea Cargo Charter is a global framework for measuring and reporting how ship charterers' activities align with society's goals. This report marks the first time Signatories disclose the climate alignment of their activities, and the first disclosure of climate alignment using the Energy Efficiency Operational Indicator (EEOI) as a metric.

Download the 58 page report at **https://bit.ly/3PyfBEJ**.

UK Waterways Ombudsman annual report 2021-2022 published

The Waterways Ombudsman annual report detailed 63 enquiries, 51 of which were directly about the Canal & River Trust, one about the Avon Navigation Trust (which was not upheld) and the others about bodies not in jurisdiction.

Download the 32 page report at **https://bit.ly/3PARHbF**.

Coast Guard releases 2021 boating safety statistics

2021 RECREATIONAL BOATING STATISTICS

With the pandemic putting more people than ever on the water and consequent rise in boating accidents and fatalities, there's some better news in the newly released 2021 U.S. Coast Guard Recreational Boating Safety Statistics.

Download the statistics at **https://bit.ly/3BdUtiu**.

The effects of Covid-19 on European shipping are revealed in a new report

EMSA
European Maritime Safety Agency

Using data mainly from the Union Maritime Information and Exchange System (SafeSeaNet) and, in certain cases, combined with LRIT and MARINFO data, EMSA has been able to compile and publish a report providing figures on the impact of Covid-19 on European shipping traffic.

Download the 22 page report at **https://bit.ly/3OxFsv7**.

DNV's published a forecast and insight about the development and role of hydrogen in the energy transition

In his introduction to this report, Remi Eriksen, Group president and CEO of DNV, writes as follows:

Welcome to DNV's first standalone forecast of hydrogen in the energy transition through to 2050. While there are ambitious statements about the prominent role that hydrogen could play in the energy transition, the amount of low-carbon and renewable hydrogen currently being produced is negligible.

Download the 144 page report at **https://bit.ly/3xQuFH8**.

Global Claims Review 2022: Allianz Global Corporate & Specialty

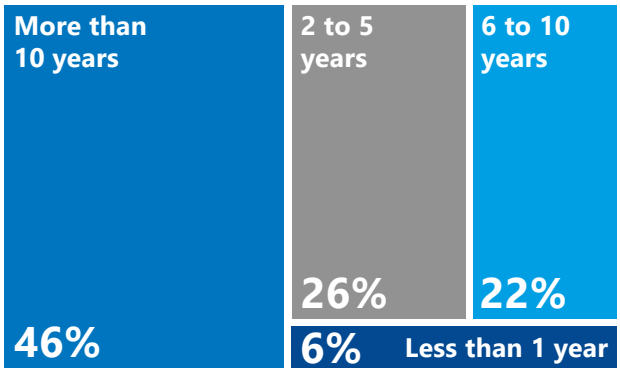
Over recent years, the insurance sector around the word has faced unprecedented times, not just in the area of marine surveying where loses and insurance claims remain high. This review from Allianz may, in part, explain just why surveyors' PI insurance premiums around the world have jumped.

To access the report go to **https://bit.ly/3oLN2rH**.

Results of the IIMS Membership Survey
CONDUCTED IN JULY 2022

A total of 251 online surveys were returned representing nearly a quarter of the membership, an increase of over 20% on the last survey conducted in 2018.

Q1: How long have you been a member of IIMS?

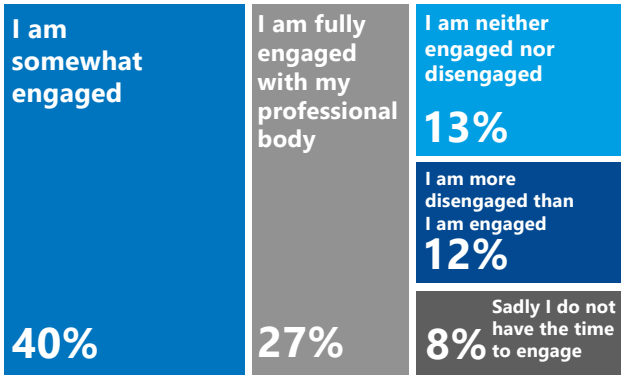


Comment: *Of those who responded to the survey, nearly half (46%) had been in membership for more than ten years.*

Q2. Why is your membership important to you and what are your main motivations for being a member?

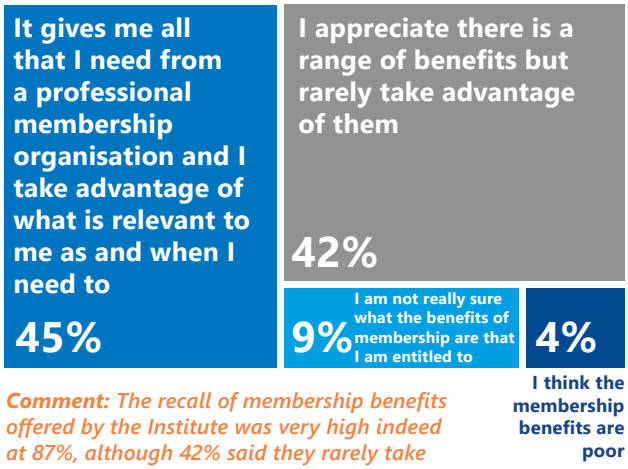
Comment: *The value of being able to show membership of a professional surveying organisation was chosen by 78%.*

Q3. What is your level of engagement with IIMS would you say?



Comment. *In total 67% said they were either fully or somewhat engaged with IIMS.*

Q4. How would you rate the range of IIMS membership benefits?

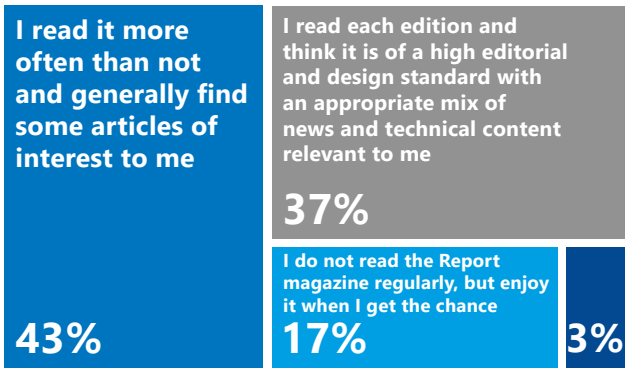


Comment: *The recall of membership benefits offered by the Institute was very high indeed at 87%, although 42% said they rarely take advantage of them.*

Q5. Which of the following membership benefits have you taken advantage of?

Comment: *No real surprises when asked which membership benefits were of the greatest value. Training came top at 59% and the ability to use the IIMS logo a close second with 52% stating its importance.*

Q6. Please give your opinion about the quarterly Report Magazine?

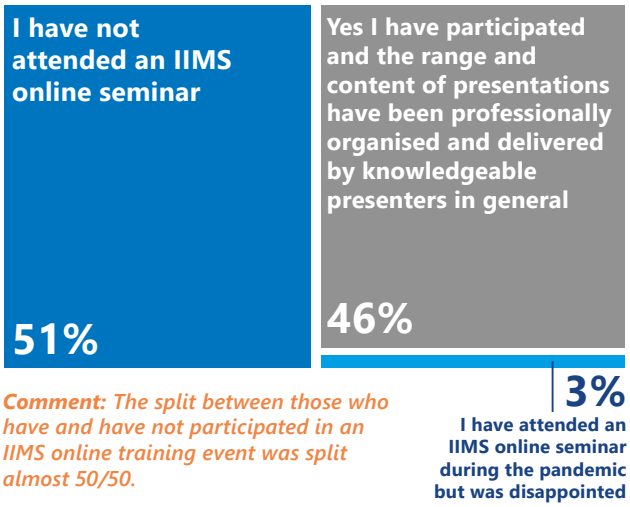


Comment: *The approval ratings for the Institute's quarterly Report magazine were very high with 80% reading every edition or reading it more often than not. 37% said they read each edition.*

Q7. Over the last year the monthly News Bulletin has grown in size and stature, featuring a lot more topical marine news. Please give your opinion on this electronic publication.

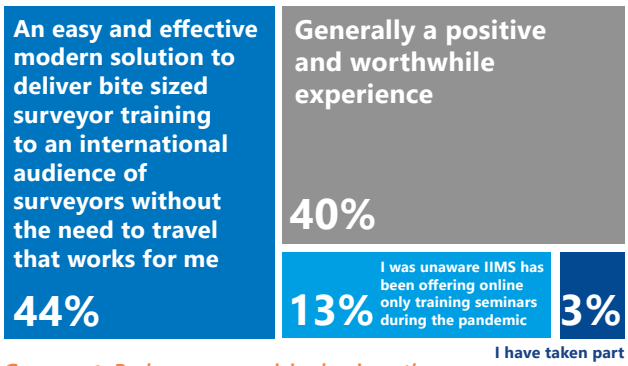
Comment: *The monthly news bulletin scored higher still than the Report Magazine. In total, 81% said they welcomed the bulletin into their inbox each month, or read it more often than not with 42% saying they read it regularly.*

Q8. During the height of the pandemic, IIMS offered a semi-regular series of online Zoom seminars. If you participated in any of them, what was your overall impression?



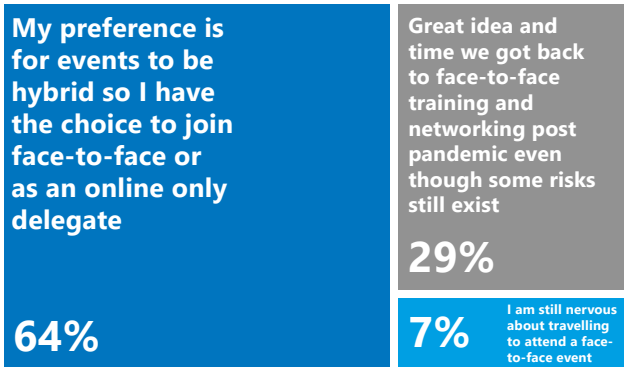
Comment: *The split between those who have and have not participated in an IIMS online training event was split almost 50/50.*

Q9. Thinking about online seminars, what is your opinion about this method of delivering training?



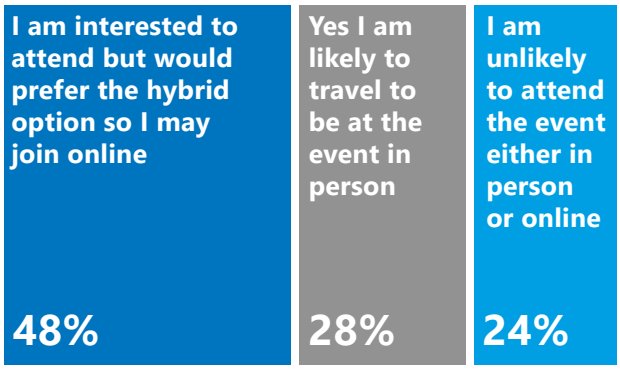
Comment: *Perhaps unsurprisingly given the development of online platforms such as Zoom and Teams, delivering remote training is now far more acceptable to the majority of surveyors than it used to be.*

Q10. IIMS is considering resuming face-to-face training events around the world. What is your opinion about this?



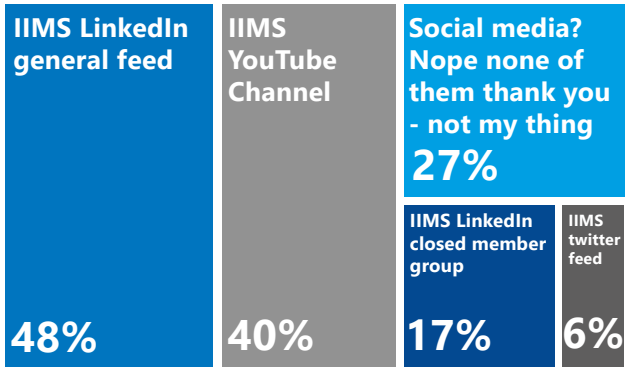
Comment: *It is overwhelmingly clear from the response to this question with 64% saying future events should be hybrid and have an online joining option. Clearly the way to go.*

Q11. IIMS is considering organising a high-profile London Conference in summer 2023 (just like in the old days). Do you think you may wish to attend and if so, in what capacity?



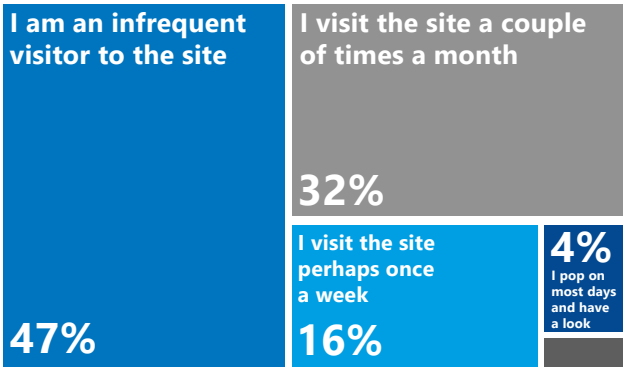
Comment: *Once again, when asked a direct question about attending a future London event, the majority (48%) indicated their preference for an online option.*

Q12. Which IIMS social media channels do you choose to use and follow?



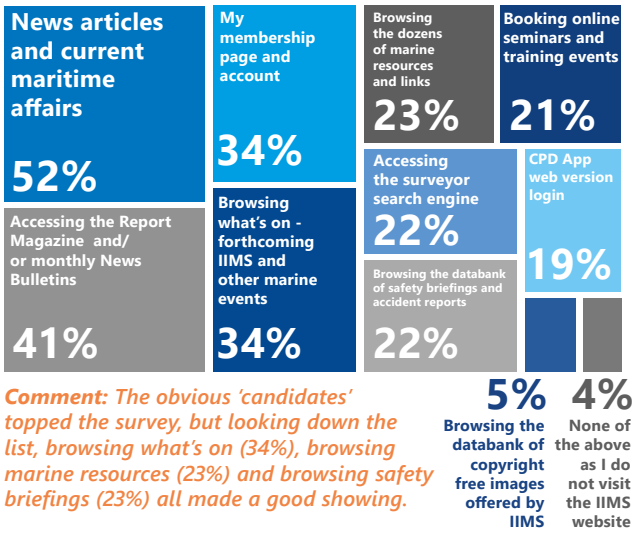
Comment: *The popularity of LinkedIn has been understood for a while, but it was a welcome surprise to see the IIMS YouTube channel being followed by 40%.*

Q14. Thinking about the high-performing and busy IIMS website - www.iims.org.uk - how often do you visit it?



Comment: *It is of concern that almost half the membership (47%) are infrequent visitors to the website. There is work to do to persuade members of the value of the website.*

Q15. Staying with the website for a moment and, assuming you use it, which areas are of most interest to you?

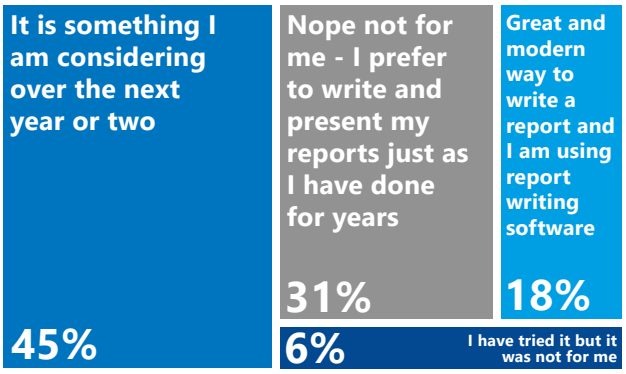


Comment: *The obvious 'candidates' topped the survey, but looking down the list, browsing what's on (34%), browsing marine resources (23%) and browsing safety briefings (23%) all made a good showing.*

5% Browsing the databank of copyright free images offered by IIMS

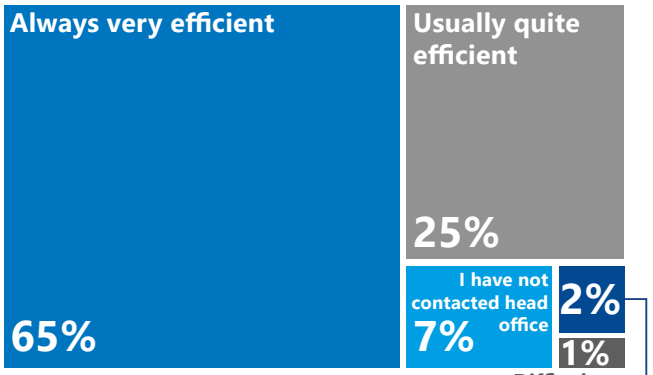
4% None of the above as I do not visit the IIMS website

Q16. At this time IIMS does not recommend any specific report writing software. But we are interested to know your thoughts on this subject.



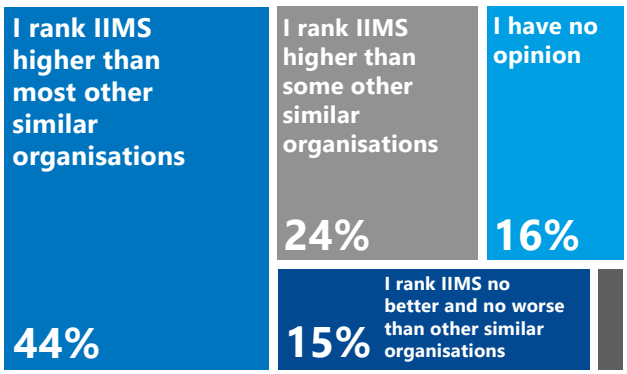
Comment: *This question drew some interesting verbatim comments about report writing software. Still the majority are considering it (45%) with a further 31% saying it is not for them. However, 18% are actively using software.*

Q17. When you have had contact with the IIMS head office, how helpful and efficient have we been in dealing with us?



Comment: *The head office team were given a resounding vote of thanks with 90% saying the team is always (65%) or usually quite efficient (25%).*

Q18. When you think about other marine surveying (or similar organisations) that you belong to, or know of, how highly would you rank IIMS?



Comment: *The overall approval rating for IIMS was high with 68% stating they ranked IIMS higher than most (44%) or some other organisations (24%). Surprisingly 16% had no opinion.*

1% I rank other organisations higher than IIMS

Mike Schwarz, Chief Executive Officer, shares his thoughts on the findings in the following statement.

Firstly, a big thank you to all those who took time to complete and return the survey. It shows that there is strong member engagement with over 250 making time to do so. My initial thoughts having seen the results and studied the verbatim comments at length are that there is a lot of love and respect for IIMS, and acknowledgement for the effort my team and I put in to create an innovative forward-thinking organisation befitting its members. Whilst that clearly is the case, there can be no room for complacency and still more is to be done to further the credentials of the Institute and its members to the wider maritime world. We have the desire to further improve what we do for our members and how we do it.

One or two findings surprised me. Although not a massively high score, to know that members are using the IIMS network to move surveying jobs round to other

members is encouraging. I always wondered if anyone searched the databank of safety briefings, or browsed the myriad of marine resources, or downloaded and listened to the podcasts; but the survey says you do – so we will make more! And the number of members following the IIMS YouTube channel means we will create more content as well.

The high approval ratings for our communications vehicles – the Report Magazine and monthly News Bulletins - are especially gratifying, not least for me as I enjoy editing both. This would seem to be a ringing endorsement that our two main communications channels, which are high on topical and relevant editorial content, are perceived to have value and are enjoyed by the vast majority of members. My personal goal is to encourage more members to visit the website more frequently.

Perhaps the most telling findings relate to the future of face-to-face conferences and events. There is some appetite for such gatherings, but the overwhelming majority would prefer events to be hybrid so that they may join online. More than a few said they were still nervous about travelling. Food for thought.

The findings of this research will help shape the future IIMS strategy for the next three years.

Verbatim comments from the IIMS Membership Survey 2022

In the 20 years of being a member I have seen the ebbs and flows of the IIMS, good and bad, but I think that in its current form, the Institute is the most professional and engaging it has ever been.

They (online seminars) are very expensive, and I don't understand where all the money goes to and to what end.

I want to say thank you. It was a great networking opportunity and maximized my contacts and clients. Also, other surveying companies sometimes recognize me because I am an IIMS member. Being an IIMS member helped me to know others and meet other IIMS members.

Extremely efficient always. My business would not operate without HQ.

Because in America people speak very well of IIMS and it seems important to us to belong.

I used to find the printed Report more comfortable to read and refer to. There is so much nowadays on electronic platforms that I prefer having a printed magazine in my hands.

I am satisfied with what the IIMS can do for me. I'm working in an area where no colleagues are close by so my job is quite solo and therefore I would like to restart the face to face meetings.

Always helpful and professional (head office team).

Grateful the IIMS is there to support members. Keep up the great work.

The cost of courses is too high to incentivise me to undertake some of them, please try and reduce these costs.

Great leadership and innovative thinking are a real strength. Well done IIMS.

I do not think that any other marine surveying organisation has the depth, resources and credibility that IIMS enjoys. This has taken many years to establish.

The Institute is raising awareness of standards required in the marine surveying profession and I believe that is very important for the industry.

In the last 10 years of membership I have rarely benefitted from the membership.

My IIMS membership and my eCMID Accreditation have helped me to get in touch with my main clients and I would most likely not be able to work as a full-time Marine Surveyor without the membership and the accreditation.

IIMS has been excellent for me. Educational, informative, giving advice in business, politics and much more.

I am an Australian member so distance, especially in recent years, makes engagement difficult.

I believe that being a member of the IIMS gives me more credibility in an increasingly competitive marine industry where wooden boat surveying and restorations are a growing market.

Keep up the good work, much appreciated.

I greatly regret not being more involved with the IIMS as I have always enjoyed the interaction with colleagues. However, time constraints are the only reason why I do not participate more.

Very great professional body. Thank you very much for all!

I would be happy to be more engaged with IIMS. However, living in Australia can make it difficult.

I think overall the IIMS do a great job and provide value for members.

I think the Magazine is BRILLIANT!! and always enjoy the content even if many of the articles are outside of my experience.

Mike and his team are doing a great job and salutes to their professional approach.

IIMS gives access to a wide range of surveying resources.

The website is invaluable and always interesting.

Can we have IIMS stamps with numbers for our reports?

I am very proud to be an IIMS member. The Institute has grown from strength to strength over the past few years.

Most important is the knowledge fund that IIMS has.

It is an honour to be a member of a great organisation.

The Report and newsletters are excellent.

IIMS helps us to remain updated in the marine survey profession.

Dealing with the office is so easy and everybody is so helpful. Thank you.

I would like to congratulate you on this feedback survey. I'm sure that it will help you to improve your service to members. Good luck in the future.

Thank you for all your hard work in promoting us as surveyors and our profession to the wider world

Long may IIMS continue.

Really appreciated the online seminars especially as I am bit more remote than a lot of the members. One of the few good things to come out of Covid!

A pleasure to work with head office.

The CPD points have gone too high to achieve with the types of surveys that I carry out.

You make great publications.

Nothing but positive experience for a crew of talented cat herders.

It would be nice to receive upgrade invitations.

The online CPD programme is first rate.

In my experience having worked with other CA's the IIMS has clearer standards as per my personal view and an effective and fast response.

The online seminars are of good quality and informative.

IIMS membership is a valuable asset to my career.

Great to keep up with the ever changing field of surveying and find IIMS to be on the cutting edge of this field.

I'm glad that the IIMS is working in the background to make marine surveying more recognizable and influential.

The website is great.

Letters after my name have helped in assorted ways.

I would like to see a day when surveyors must be a member of an organisation like IIMS to be allowed to practice, thus enabling the creation of a basic industry standard in all levels of surveying, which currently does not exist.

IIMS offers more and works harder for its members than any organisations I am familiar with. IIMS provides the most significant contribution to our industry. Thank you.

To raise the standard of marine surveying and in doing so public awareness as this is a skilled trade.

If you continue to shake the tree - as you are - you have awoken the SAMS bunch into trying, but not getting even close to what you are producing. I have complained twice or more about issues with SAMS and had no feedback about educational items from international sources. This year they have made it almost impossible to pay for insurance if you are not from the US. Even though I pay my dues for both, I feel better supported by the IIMS.

New IIMS President takes up office at recent AGM

At the IIMS Annual General Meeting, broadcast live from Murrills House in Portchester UK on Tuesday 7th June 2022, Peter Broad formally took up his position as President of the International Institute of Marine Surveying for a two-year term succeeding Geoff Waddington.

Whilst most delegates joined the event online, the management board meeting had taken place earlier in the day meaning that a few could attend the AGM in person for the first-time post pandemic.

The now immediate Past President, Geoff Waddington, opened the AGM with a short speech. In it he explained what a strange presidency it had been with the inability to meet members due to the pandemic.

He said, "The past 2 years have been an interesting time with Covid and Brexit. Both Boris Johnson and I have something in common, having both entered into a maelstrom of unforseen problems. It has made it interesting."

"There have been some highlights - one of them, of course, is that we now own this magnificent building, Murrills House and what a splendid place it is for the institute to have as a home. A very good investment and one which the membership should be very proud of."

"The other thing I can say to the membership on behalf of myself and the board is what a wonderful job that our institute staff have done over the past 2 years. I am particularly most proud of the Report Magazine and the news bulletins which I think is the shop window of our institute."

And so, in a short ceremony during the AGM, Geoff passed the President's Medal over to Peter Broad, who is a marine surveyor engaged in the heavy end of commercial shipping, based in South Korea.

In his address, Peter Broad said, "I am truly honored to be elected as President of IIMS."

"Thank you to Geoff for steering the ship through these turbulent 2 years. We have come a very long way through a strange time and IIMS is on a much more solid foundation with the acquisition of Murrills House."

"I hope to continue to build on this success and the legacy from Geoff and former Presidents and I know I have big shoes to fill."

"I hope I can support Mike and the IIMS staff in continuing to build our professional reputation."

Mike Schwarz, IIMS Chief Executive Officer said, "I would like to extend my personal gratitude (and on behalf of the membership) to Geoff for the work he has done during the most trying times imaginable that most of us can recall. My head office colleagues and I are grateful to the support he has given over the past two years."

"I would like to welcome Peter into his new role as President and look forward to working with him over the coming period."

With Peter Broad moving up to President, congratulations are due to Capt Ruchin Dayal who becomes Deputy President and Mike Proudlove who has been elected as the new Deputy Vice President.

From left to right – Peter Broad, Mike Schwarz and Geoff Waddington

2022 AGM voting

Over 100 votes were cast ahead of the AGM as follows:

Do you approve of the re-election of the Management Board en-bloc?

For: 95 votes
Against: 2 votes
Abstain: 4 votes

Do you approve the nomination of Mike Proudlove as the next Deputy Vice President?

For: 90 votes
Against: 2 votes
Abstain: 9 votes

Do you approve the proposed fee structure increase for 2023 membership?

For: 64 votes
Against: 32 votes
Abstain: 5 votes

Mike Schwarz with the 24lb cannon ball, presented to IIMS by Geoff Waddington

As a parting gift to the Institute, Geoff Waddington presented a 24lb canon ball mounted on a specially made wooden plinth. The inscription reads as follows: *'A 24lb cannon ball dated circa 1804. Extracted from within the barrel of a cannon overlooking Port of Spain, Trinidad by Royal Navy Artificer Apprentices from HMS Intrepid in 1989'.* IIMS is most grateful to Geoff and the cannon ball has pride of place in the office.

Chris is pictured (right) being handed his award by Peter Broad, President.

Two awards announced at the AGM

Chris Moody was given an Honorary Membership for his services to the Institute and his commitment to the yacht and small craft industry over many years. Chris, who is Deputy Chairman of the Certifying Authority, has scrutineered numerous tonnage measurement surveys and coding surveys over many years. Although now retired, Chris performs an important role for the Institute. Chris is pictured being handed his award by Peter Broad, President.

Also receiving an award was Graeme Temple, a long-standing member based in Singapore, who was given a Fellowship. Graeme who is currently Regional Director, Marine Technical Services for Charles Taylor based in Singapore has spent the last 15 years in Asia as a Marine Consultant and Managing Director assisting insurers and shipowners in a wide range of marine matters. He has developed specialist knowledge of marine machinery failures on a wide range of vessels including general cargo, container, LPG, AHTS, superyachts and small craft.

IIMS President gifts two picture canvases to the Institute

Following his election as President earlier in the year, Peter Broad spent some weeks in the UK before his return to South Korea. On one of his visits to the Head Office he brought with him two canvases of great historical family interest taken from original artworks and presented them to Mike Schwarz, IIMS CEO. The works of art are now proudly displayed in the offices and IIMS is grateful to Peter for his generous gesture.

Helpfully, Peter has supplied some background detail about the two pictures.

"SHAMROCK V" was an original pencil sketch drawn by Joyce Jefferies, an art teacher at Portsmouth High School for Girls. She managed to walk into the Camper and Nicholson yard and sketch the 'Shamrock V' under construction in 1930. Joyce Jefferies was Peter Broad's maternal Grandmother.

Shamrock V photo credit: Merijn de Waard / SuperYacht Times

History of Shamrock V

In 1929: Sir Thomas Lipton, owner of Lipton Tea, decided to challenge for the America's Cup for what was to be his fifth and final time. He commissioned naval architect, Charles E. Nicholson, with the task of designing Shamrock V. She was built at Camper and Nicholson Shipyard in Gosport, UK. Shamrock V was the first J-Class yacht to be commissioned and built in the UK. She was constructed of teak planking over steel frames and boasted a hollow spruce spar.

Shamrock V launched in April 1930, and promptly won 15 of 22 races on the British regatta circuit. Then Lipton and crew sailed her across the Atlantic to challenge the New York Yacht Club for the 14th America's Cup. Over 31 years and five attempts at the Cup, Sir Thomas Lipton endeared himself to the American public and made his tea famous in the process. Lipton was a self-made man, born into poverty in Glasgow. Americans appreciated his grit

and determination. The ever-gracious Sir Thomas was awarded a specially designed cup for "the best of all losers" after Shamrock V's defeat in 1930. At age 79, it was his last attempt at the Cup. He died the following year.

After Lipton's death, Shamrock V was sold to aviation designer and magnate, Sir Thomas Sopwith, founder of Sopwith Aviation Company (and inventor of the famous Sopwith Camel). He raced Shamrock V in Britain, and in turn sold her to fellow aviation mogul Sir Richard Fairey, who campaigned her with King George V against other J Class yachts in 1935.

Although bad luck hampered Shamrock Vs America's Cup bid, her luck was about to turn. Just before World War II, Italian senator and publisher Mario Crespi purchased Shamrock V. Under the Fascist rules in Italy at the time, Crespi was required to rename his boat. Shamrock V became Quadrifoglio – meaning 'four leaves' in Italian. This turned out to be a stroke of lucky timing. Had the yacht remained in England, she surely would have been sacrificed for war materials. During the war, Crespi hid Quadrifoglio in a hay barn in Italy so that her metal fittings wouldn't be stripped for the war effort. After the war, he initiated an extensive refit, installing her distinctive bird's eye maple interior and adding an engine. The family owned Quadrifoglio until Crespi's death.
In yet another stroke of luck, Quadrifoglio was bought by Piero Scanu in 1968 – just days before she was to be broken up for scrap. In 1978, his son yacht designer Paolo Scanu returned her to the yard in England where she was built and oversaw a major restoration. Eventually she came full circle and was purchased by The Lipton Tea Company, who donated her to the Museum of Yachting (now merged with the International Yacht Restoration School) in Newport, Rhode Island. The museum restored her original name, almost 50 years after it was changed.

The third major lucky break for Shamrock V came when Elizabeth Meyer, who had restored original J Class yacht Endeavour, took on another extensive refit for the vessel lasting 3 years. Thanks to Meyer, both Shamrock V and the J Class have enjoyed an amazing renaissance. In 1988, the three surviving original J Class boats – Shamrock V, Endeavour and Velsheda – raced against each other in the Antigua Classic Regatta. It was the first time in five decades that more than two J Class yachts had competed. Shamrock V emerged the winner and kicked off a revival of J Class racing that continues to this day.

Although only ten J Class yachts were built during their heyday, plans were originally drawn up for twenty boats. New boats using these specifications have been built, continuing to grow the class more than 85 years after it began. In June 2017, Shamrock V competed at the America's Cup J Class Regatta in Bermuda with six other Js including newer builds Hanuman, Ranger and Svea. It was the largest J Class fleet in history and surely a beautiful sight to behold.

All in all, the four-leaf clover proved lucky for Shamrock V. Although she didn't win the America's Cup, she survived to bring the beauty of J Class sailing to new generations. Here's hoping Shamrock V and the magnificent J Class survives another 80 plus years.

"CORDELIA"

Jonathan Barron was Peter Broad's Great, Great Grandfather. Born in Mevagissey, Cornwall in 1835 he was Captain of the Cordelia from 1879-80 and again from 1882-83.

Not a great deal is known about Cordelia, but on January 20th, 1882, she sailed from New York to Dunedin, New Zealand.

February 25th, 1882, 25°S 29°W, she arrived in Dunedin on April 21st 1882.

Codelia was sunk by a submarine whilst on voyage from Pascagoula for Newport carrying pitch pine on April 24th 1917.

Codelia specifications

Classification:	*Lloyd's Register of Shipping +A1*	*Type:*	*Iron Barque*
Built:	*Port Glasgow by J. Reid & Co.*	*Official No.*	*60010 (since 1872)*
Signal Letters:	*HNCJ (since 1874)*	*LOA:*	*172.4 feet*
Owners:	*C.T. Bowring & Co.*	*Breadth:*	*28.2 feet*
Delivered:	*August 1867*	*Depth:*	*18.5 feet*
		Net Tonnage:	*598 tons*
		Original Captain:	*J. Symons*

Palma, Mallorca networking event

The first post pandemic IIMS event in Palma took place in the city on Friday 10 June.

It was the initiative of IIMS member, John Walker, and the networking gathering drew an audience of 7 people.

Those who attended gave the meeting the thumbs up! In attendance were John Walker, Paul Madely, Timothy Bell, Felix Bussmann, Graham Ferreija, Esperança Ruiz and Juan Roig.

From left to right: Rosie, Vicki, Paul, Camella and Rachel

Newer IIMS HQ staff out on survey

IIMS has had a policy in place of taking new members of staff out on a dummy survey for some years. The pandemic has made this far trickier in recent times, but some of the team finally managed to join Paul Homer (Chairman of Standards) last month at a Fairline brokerage on the River Hamble near Southampton. The morning was spent tapping the hull of the Fairline Squadron named Kathryn, playing with moisture meters and thickness gauges, and crawling around in the engine room to understand the importance of the work carried out by marine surveyors.

Despite the boat being relatively new, the team managed to discover a few minor issues which would certainly need to be highlighted in a subsequent report. Those in attendance - Vicki Loizides, Rosie Webb, Rachel Moores and Camella Robertson - were appreciative of Paul's knowledge and now have a far greater understanding of the importance of the surveyor's vital role.

IIMS exhibits at Seawork

The IIMS head office team took it in turns to man the stand at the three-day Seawork show from 21 to 23 June at Southampton. It is great to see the event back after the pandemic and the organisers should be applauded for their efforts to get the show back up and running again. Sadly, the event did not attract the level of pre pandemic visitors this time around.

A series of disruptive one day strikes by rail workers did little to help matters either. Despite this, the team met some members and non-members, as well as networking with industry contacts.

Future IIMS President, Mike Proudlove (left), current President, Peter Broad (centre) and past President Adam Brancher (right) are pictured on the IIMS stand at Seawork 2022.

New IIMS representative for the BSI GME/33 Small Craft committee required

The late Jeffrey Casciani-Wood represented IIMS on the BSI's GME/33 Small Craft committee for many years.

Following his death, the Institute is looking for a replacement to join this committee to carry on this work, which is not onerous.

The British Standards Institution (BSI) is the national standards body of the United Kingdom. BSI produces technical standards on a wide range of products and services and also supplies certification and standards related services to businesses.

BSI's GME/33 Small Craft committee provides the UK input into the international (ISO) and European (CEN) standards committees for small craft – ISO/TC 188 and CEN/TC 464 – and has nominated UK experts to join each of their Working Groups.

GME/33 has one sub committee - GME/33/1 – which was specifically set up to cover water safety and rescue equipment, and they will be developing a new British Standard on throw lines/bags.

If you are interested in helping to develop new standards and would like to be considered as the IIMS representative, please email Rosie Webb at info@iims.org.uk to register your interest and we will send you more information.

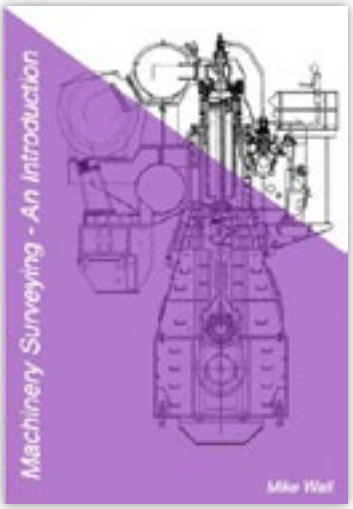
A review of the book 'Machinery Surveying – An Introduction'

The book has been authored by Mike Wall *BSc, MSc,FIMarEST, FRINA, QDR.*

The book was presented in paperback format and of a size that made it possible to easily slip into a bag to travel with. The reviewer found the book to be very informative, especially the case study sections which were particularly helpful. The book contains thirteen case histories based on actual incidents which show what machinery damage investigations might look like. It also covers various reporting techniques relating to such incidents.

There is a good reference and glossary terms section, all of which would be helpful to readers who are less experienced in the field of Machinery Surveying, or who are studying for a professional qualification in surveying.

The reviewer would like to have seen more detail about lubricating oils as these are so often at the root of, or certainly often supply evidence of mechanical failure. There could have been more detail on the types of oil used.



Human Error was given a very high percentage in relation to accidents and failures, the text implied poor maintenance as the principal cause with which the reviewer totally agrees. More often than not this is down to vessel owners' attempts to reduce operating costs.

A useful addition to the libraries of both marine surveyors and engineers and recommended for those studying for a professional qualification.

About the author
Mike Wall, joined Cunard Line as a marine engineer apprentice at the age of 17, eventually reaching the rank of Chief Engineer with service aboard many types of vessels and various engines.

During his career Mike has obtained:

- A First Class marine engineer's certificate of competency
- Class 1 Hong Kong Local Master's Certificate
- A Bachelor of Science in Nautical Studies
- Master of Science degree in Shipping and Maritime Studies.

Mike Wall worked extensively in hull, machinery and cargo surveying in Europe, USA, New Zealand, Pacific Islands and East Asia for many years.

'Machinery Surveying – An Introduction' is directly available from Mike Wall. Website: **http://www.mikewallassociates.com**
Email: **mikewallassociates@gmail.com**

Post Covid cruising on Queen Mary 2 - Subtitle: Queue and Check!

By Capt John Noble HonFIIMS

Photo by Ray Harrington on Unsplash

I sailed on my first Cunard trip as a passenger on the grand old lady, Queen Mary, in 1966 having paid off in New York. Later, with my wife Louise, I sailed as a passenger on some 5 or 6 voyages on the QE2, first with Peter Jackson as Master and finally with Ian Macnaught. A fine ship and I have visited her several times in Dubai.

More recently, we have completed a couple of voyages on the Queen Mary 2; Southampton - New York - Southampton with 13 days at sea and 12 hours in New York!

The purpose of this short digest is to offer some critical comments on the post-covid experience on the QM2.

Queue and check
The one common factor was the queue and check routine.

1) On joining in Southampton there was a queue to have the Covid documents checked; the next queue was to actually check in and confirm the reams of paperwork filled in by computer before even leaving home; this included a "Health Declaration". Then, there was a 45-minute wait before the boarding process began. Another queue for security checks as strict as I have experienced at any airport. Once able to board, there was a further queue on the boarding gangways while voyage cards were issued.

2) On board queueing was fairly limited during the voyage until arrival in New York. Disembarking involved a long queue! Perhaps surprisingly the immigration queue was short and the officer most polite! Then the fun started. There was a long queue for a taxi, and it took over an hour. Returning to the ship involved a 30 minute queue for security checks.

On board
If the old Queen Mary can be described as a Grand Old Lady, Queen Mary 2 is best now described as a post-menopausal Duchess. There are signs of poor upkeep.

The "elegance" usually associated with the Queen's grill dining was not as fine as 4 years previously. For example, I like my Darjeeling tea and in 2018 it was served loose leaf with teapot and strainer. Now all tea comes in a teabag!

In the post-Covid period all the crew still had to wear face masks. This made communication difficult when speaking to crew members whose mother tongue was not English. The ship still showed the "Hands, Face, Space" signs all over and in the King's Court dining area many tables were indicated as not in use. It was like going back to the immediate post lockdown era.

Finally
Had I been undertaking a condition survey, I would probably have made a few observations or deficiencies:

1) Carpets: Where there are defects in the worn carpets causing a "trip hazard" I would have noted location and made a strong recommendation that suitable remediation action was taken immediately.

2) Lifeboat Falls: Where grease had been applied unevenly, especially round the blocks, I would issue a deficiency. There are a number of serious instances where ungreased wires have failed resulting in mishaps, sometimes serious.

3) Emergency exit: In the Queen's Grill dining area, at the very aft end inboard, the doorway is marked "Emergency Exit". There is a small area coved off where a table is placed right next to the door. This effectively blocks the exit; not good in an emergency if diners have to flee aft. I think this would merit a serious deficiency if I am right.

Knowing where to hammer tap can be a valuable skill

(With thanks to Paul Dixon)

Have you ever heard the story of the giant ship engine that failed? The ship's owners tried one expert after another, but none of them could figure but how to fix the engine.

Then they brought in an old man who had been fixing ships since he was a youngster. He carried a large bag of tools with him and when he arrived, he immediately went to work. He inspected the engine very carefully, top to bottom. Two of the ship's owners were there, watching this man, hoping he would know what to do.

After looking things over, the old man reached into his bag and pulled out a small hammer. He gently tapped something. Instantly, the engine lurched into life. He carefully put his hammer away. The engine was fixed in an instant!

A week later, the owners received a bill from the old man for ten thousand dollars. "How much?!" the owners exclaimed. "He hardly did anything!"

So, they wrote the old man a note saying, "Please send us an itemized bill."

The man sent his bill to them which read as follows:

Tapping with a hammer	$2.00
Knowing where to tap	$9,998

Effort is important but knowing where to make an effort in your life makes all the difference.

Forthcoming IIMS event: **IIMS tonnage training in-person and remote**

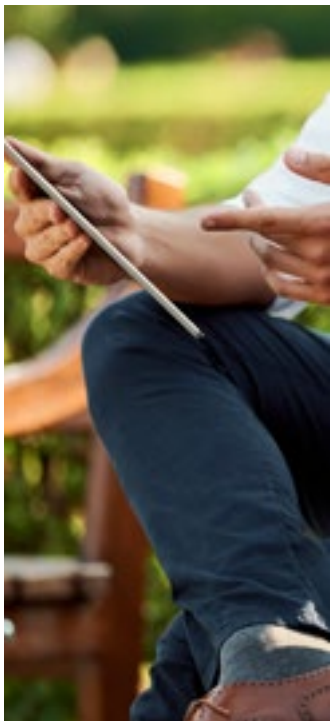
An all day event for in-person delegates and half day for remote delegates, being held at Itchenor, UK on 14 September 2022.

IIMS is authorised by the Maritime & Coastguard Agency (MCA) to conduct the training and subsequent approval of tonnage surveyors through online theory training (Part I) and remote practical video demonstration (Part II). This is an additional service to its existing face-to-face UK tonnage training, which has been authorized by the MCA for some years.

The three-hour morning Part I session is available to both in-person and online delegates. Those attending in-person will be able to carry out some measuring on nearby vessels in the afternoon session and complete the paperwork leading to formal recognition as an approved tonnage measurer and will not need to do Part II. Those who are online will need to complete Part II in their own time remotely using video evidence to demonstrate their knowledge.

This training is available to IIMS members and non-members too. But to become formally authorised to process tonnages through IIMS, (where the Institute has registry agreements in place), Part I and Part II must be completed and you need to be a member. Those who wish to study Part I only, UK tonnage measurement theory, may do so to extend their surveying knowledge.

For full details about the event go to **https://bit.ly/3n5wkT8**.



Forthcoming IIMS event: **Report Writing Online Seminar**

The next quarterly Report Writing seminar will be broadcast using the zoom video conferencing platform on Tuesday 1st November at 10.00am UK London time and will last for 3 hours. The seminar is open to anyone wishing to brush up their report writing skills. Your hosts and presenters for this seminar are Paul Homer, IIMS Chairman of Standards and Mike Schwarz, IIMS Chief Executive Officer.

IIMS continues to receive an unacceptably high level of complaints about surveyors each year, generally caused by poor writing standards and skills, some of which are serious in nature. A report is the surveyor's intellectual property and he/she lives or dies by it. This online course, featuring a lot of new content brings the art of report writing bang up to date. It aims to provide the essential information that a yacht and small craft surveyor needs to consider when gathering the information and then compiling his/her report. There are suggested clauses for use in the report to protect against possible litigation and advice in the event that something goes wrong. Additionally, there is advice on contracts and terms of business and how, when and where these should be used. There is also a practical session and delegates will be required to do a little preparation before the seminar in readiness and encouraged to contribute their thoughts. So, if you want to tidy up and strengthen your report writing skills this is a good place to start.

For full details and to reserve your place go to **https://bit.ly/3PL6HTY**.

Forthcoming IIMS event: **Large Yacht & Small Craft Autumn Training Day**

The group has not met since before the pandemic and this marks a welcome return, although it will be held as a hybrid event, meaning in-person delegates are encouraged, but online participation is available too. The training day is taking place on 16 November 2022 at a location near Portsmouth, UK.

Confirmed presenters for the event include (timeslots to be confirmed) are:

Cygnus Instruments Ltd manufacture and supply ultrasonic thickness gauges which are employed in almost every industrial application around the world and will give a practical demonstration.

Ocean Safety Ltd specialises in the worldwide supply, distribution, and hire of marine safety equipment.

Steve Bockett will discuss three principal topics:
– Lifejackets and their required maintenance;
– Integration of MOB beacons;
– Life raft identification and certification.

Marine Fire Safety Ltd supply, install and maintain firefighting and fire detection equipment for marine applications.

Karen Brain – Topic to be confirmed.

Mike Schwarz, IIMS CEO –
Update on IIMS activities

More presenters to be announced shortly.

Event open to IIMS and non-IIMS members. In person delegates encouraged, but you may also join online.

For more details go to **https://bit.ly/3PEjGak**.

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For more info email **education@iims.org.uk**, tel. **+44 (0) 23 9238 5223**

From the Murky Bilge

As twilight approaches, the boat rocks gently on the mooring. We summon the last of our energies. It's been another hot long day. Where has everyone gone? Am I suddenly alone on this vessel?

This month's offering comes from IIMS member Juan Casimiro. *The following article was translated from the original by computer.*

Is that a rustling I can hear or feel from below? Surely not. Reluctantly we feel as if we are being drawn, down.

Filled with a mixture of trepidation and dread, we slide aside the cover, it screeches as if in protest and peer down into the gloom of the murky bilge. The atmosphere is stale, like it couldn't support life, with a hint of something not quite alive, or recently was alive, tiggering primordial fears.

There's nothing else for it. We crawl into the confined space, carefully placing hands and knees, like Indiana Jones on his final adventure. We wish we had some gloves, Indiana had some. The first hint of a spider and that's it, we're out of here.

On hands and knees, we shuffle along a slippery beam, sweat running down our faces. The sweat runs off our nose, onto the beam making the already risky balancing act even more treacherous. The light from our flashlight seems unable to penetrate as if suddenly a fog has come down. The light dimly reflects from frames either side of the longitudinal, like Jonah being inside the skeleton of a vast whale, our movement making the shadows dance. Of course, Jonah would not have had concerns of giant spiders.

Gradually through the haze we see the image below, which becomes imprinted onto retina.

We shake our heads in disbelief, trying desperately to comprehend what we see. We clear our eyes of sweat and try to brush tiredness aside. Then, with a final huge effort and working through various flooding scenarios, realisation takes hold, and all thoughts of spiders evaporate.

The following thought comes to mind and was simply impossible to dismiss. The guy who did this, the installer, what was he thinking?

So, this month's question is this: "WHAT WAS THE NAME OF THE INSTALLER'S FATHER"???????

Suggestions for the name of the installer's father by email to: murkybilge@gmail.com. The person who provides the "best" answer will receive a printed copy of the next edition of the Report Magazine. The winner will be announced in the next edition of the Report.

Any of you who have interesting photographs like the one above please send them to **murkybilge@gmail.com**, with an explanation and what should be the light-hearted discussion based on the image. Should they be published you will be accredited.

Congratulations to Ross Keeble, who is the winner from the Murky Bilge feature in the June Report Magazine. He wins a hard copy of this edition of the Report Magazine September. Ross, who is located in the BVI's, admits he was "kept awake last night" considering the image.

BACK IN TIME

BRITAIN'S HISTORIC LITTLE SHIPS

*By **Geoff Waddington** FIIMS, Immediate Past President*

Following on from my introductory article in June's Report Magazine this feature sets out to cover some of the history behind a range of restored vessels with which I have been involved. I must begin with an apology for mis-spelling Mr Richard Hellyer's name in the first article (sorry Richard). The material and information contained in this article has been re-produced with the kind permission of Richard who along with others founded the British Military Powerboat Trust who began restoring these vessels many years ago and the Portsmouth Naval Base Property Trust who now continue to restore and look after them. I have been lending assistance with some independent surveying and also coding work on behalf of the IIMS Certifying Authority. This year we completed the coding of MGB 81 in time for Armed Forces Day on 24th June.

HSL 102

Vessels Details:

Type:	100 class High Speed Launch
Service:	Royal Air Force / Royal Navy
Builders:	British Power Boat Co
Year Built:	1936
Number Built:	22 (RAF 100 - 121)
Displacement:	19 Tons
Length:	64 ft
Beam:	14 ft
Draught:	3½ ft
Hull:	Mahogany
Engines:	3 x 500hp Napier Sea Lion
Max Speed:	39 knots

One of the oldest vessels is HSL 102. The prototype, HSL 100, was launched in May 1936 and on trials surpassed all the parameters set by both the builders and the RAF. The Air Ministry immediately placed further orders, with HSLs 101-114 ordered in stages. Built by The British Power Boat Company at Hythe, the 100 class HSLs were designed by Fred Cooper. The class were a stretched version of the 60ft MTB hull and the prototype was the format on which the RAF based their decision for a new type of high speed launch. The dimensions of the launch were 64ft loa with a beam of 14ft 6in and powered by a trio of Power Napier Sea Lion engines. The range was 500 miles at a speed of 35 knots. The two wing engines were inclined to drive directly to the outboard propeller shafts whilst the centre engine faced the opposite direction and transmitted via a Vee-drive to the centre propeller. This arrangement allowed for "cruising" on the centre engine only, a range extending economy measure which retained a high degree of manoeuvrability.

This 5 minute YouTube video shows 102 on the water along with some great historic footage – see **https://bit.ly/3Pkfs7G**.

HSL 102 Yard No. 1038 joined the RAF fleet in 1937 to increase the operational range duties of the 200 class seaplane tenders. She began her service career at RNAS Donibristle which was a former Fleet Air Arm base located east of Rosyth, on the Firth of Forth in Scotland where she was taken on charge on the 27th October 1937. HSL 102 was one of the many craft to be involved with Operation Dynamo rescuing Allied forces from the beaches at Dunkirk and on completion she was returned to the builders at Hythe in July 1940 for modifications.

Repairs completed, she was allocated to No.15 Air Sea Rescue Unit operating from Blyth and from April 1941. HSL 102 was subsequently transferred to operate from the seaplane base at Felixstowe (photo left), more repairs followed and during 1942 the craft was based first at Newhaven and then returned to operate from Felixstowe once again. During her time as an Air Sea Rescue Launch, she saved the lives of numerous "ditched" pilots from the sea.

With the introduction of better craft towards the end of the war, some of the class were transferred to other duties. The RAF service of HSL 102 ended on the 4th March 1943 when she was transferred to the Admiralty to become Control and Target Towing Launch No. 12. With a strengthened stem she was employed towing gunnery targets. Post WWII the CT/12 (ex HSL 102) was surplus and like many other craft sold off in April 1946.

After her sale from the Admiralty like so many other ex-naval patrol craft she became a houseboat and was found in Dartmouth in 1993. Phil Clabburn purchased her and had her towed to Plymouth where she was lifted out and taken by road to the then home of Powerboat Restorations in Fawley, Southampton. This was the base of National Power PLC who generously provided the space and facilities for her restoration, during which areas of her double diagonal planking were renewed as were her bulkheads, frames and chine. New floor beams were laid, and new bearers constructed. 60,000 screws were removed from the hull, which was then re-fastened.

Another short 4 minutes YouTube video of 102 racing across the sea – go to **https://bit.ly/3cqSblV**.

HSL 102 at time of coding to Cat 4 at Gunwharf Quay Portsmouth March 2011

A completely new deck was added, and a new wheelhouse was built from the original drawings. Once rebuilt, the hull was completely sheathed in grp. She was re-launched in July 1996 which was my first involvement with her.

MGB 81

Vessels Details:

Type:	71'/2ft Motor Gun Boat Mk V
Service:	Royal Navy
Builders:	British Power Boat Co.
Year Built:	1942
Number Built:	112
Displacement:	46.6 Tons
Length:	71½ ft
Beam:	20½ ft
Draught:	5¾ ft
Hull:	Mahogany
Engines:	3 x 1250hp Packard petrol engine
Max Speed:	40 knots

The 71½ ft design was prepared in late 1940 by George Selman, Chief Designer of The British Power Boat Co, Hythe, in conjunction with Bill Holt, RCNC, Head of the Boat Section in the Department of the Director of Naval Construction. The requirement was for a "short", fast, well-armed Motor Anti-Submarine Boat (MASB), to operate in a gunboat role, to counter German E- and R-boats which, following the German occupation of Holland, Belgium and France, had attacked Allied shipping in the English Channel and North Sea. The 71 ½ ft hull form was similar to the original 70ft BPB boat, but the hollow back profile of the deck was eliminated, and the deck was given a hogged sheer from stem to stern. In addition, the structure was very much stronger than the 70ft BPB and as a result none of them suffered from hull defects. The first boats were ordered in November 1940. These included 24 MASBs. In January 1941, the new designation "Motor Gun Boat" had come into use and the 24 boats originally ordered as MASBs were designated MGB 74-97, MGB 81 being BPB Yard No. 1807. Of the ninety-six built, thirty-nine were Mark V with the MGB streamlined canopy; the other fifty-seven were Mark VI with the MTB bridge eight of which were manned by the royal Canadian Navy.

At speed on the Solent August 2003 photograph by Mr Richard Hellyer.

The construction was on the hard chine principle with side planking of double diagonal mahogany planking and that of the bottom being triple diagonal mahogany planking. The craft were powered by three Packard 1,250bp petrol engines with the centre engine driving directly and the wing engines using a "Vee-drive". Speed was about 40 knots maximum with 35 knots being achieved continuously and 26 knots cruising. These speeds increased about 3 knots when underwater exhausts were fitted. Fuel was carried in five tanks amidships of total capacity 2733 gallons which gave a range of 475 miles at 35 knots or 600 miles at 15 knots. The MGBs had a Type 286 radar later replaced by a Type 291, however all were fitted with W/T (Wireless Telegraphy) The crew comprised 2 officers and up to 12 men. Armament included a single 2pdr Pom-Pom forward, a single twin 20mm Oerlikon amidships, 2 twin 0.303in Lewis machine guns on pedestals, a single Holman Projector aft and 2 Depth Charges. Armament varied however, and in MGB 81 the Holman Projector was later removed and replaced by a twin Oerlikon aft. During mid 1944 50 mark XII depth charges were carried for use against midget submarines.

MGB 81 was ordered on the 27th November 1940, laid down on the 16th December 1941 and launched on the 26th June 1942. She commenced trials on the 8th July 1942 and attained a maximum speed of 38.63 knots at 2,400rpm and a maximum continuous speed of 34.75 knots at 2,000rpm. MGB 81 was commissioned and accepted on the 11th July 1942, at HMS Bee, the Coastal Forces base at Weymouth. In August 1942 she joined the 8th MGB Flotilla at Dartmouth, where the first five boats were based, following their move from HMS Beehive at Felixstowe in July 1942.

MGB 81 was involved in 6 actions before being designated as an MTB in 1943. The first action on 13/14 August 1942 off Guernsey was a close-range gun attack on two enemy armed trawlers during which one trawler was severely damaged. The 8th MGB Flotilla returned to Felixstowe in September 1942, however the boats were occasionally based at Harwich. The second action was on the 10/11 September 1942 off the Hook of Holland. A few days later on the 14/15 September, the MGB's were in action again off the Hook of Holland when two small enemy motor vessels were damaged by gunfire and later four armed trawlers were hit, with no damage received to the MGBs. The fourth action was overnight 2/3 October 1942, again off Holland, when four enemy armed trawlers were engaged. MGB 78 was lost during this action. During the fifth recorded action on the 27/28 February 1943, once again off the Hook of Holland, the MGBs contacted a German

convoy and had gun action with the escorts. MGB 79 was sunk, and MGB-81 was hit by a shell in the engine room, putting her twin Oerlikon out of action and received three other hits.

In May 1943, following a refit she re-joined the flotilla at Dartmouth. In June 1943 a collision with MGB 115 resulted in underwater damage to MGB 81's stern and consequently the craft was repaired at Poole. Her last recorded action as an MGB was on the 11/12 September 1943 off Cap la Hague when she was fired on by German shore batteries. MGB 81 was hit and suffered shell damage. Hence from 16th September to 1st October 1943, MGB 81 was again at the yard at Poole for action damage repairs and the fitting of new type rudders.

In August 1943 MBG 81 was redesignated to MTB 416. Following further action in October 1943 the 1st MTB Flotilla transferred to Ramsgate (HMS Fervent) before returning to Dartmouth. She was again in refit in Poole from the 5th January to the 2nd March 1944. Her first recorded action as an MTB was on the 21/22 April 1944 in Lyme Bay, when three groups of E-boats were plotted in the area. The MTBs engaged two at close range, once again she suffered action damage and was sent back to Poole for further repairs, following which in May 1944 she was back in service for the Normandy landings in which she was involved from the 6th to the 30th June.

A few days after D-Day, the flotilla transferred from Dartmouth to HMS Hornet at Gosport. Overnight on the 23/24 June 1944, she was involved in an attack on a German convoy leaving Cherbourg. Although she was only backing up the operation one of her crew was killed. In the following month on the 18/19 July whilst operating off Cap d'Antifer, she achieved hits on German Minesweepers, however her hull was damaged by shell fire, and she returned once again to Poole for repairs.

Following the withdrawal eastwards of German land forces, the 1st MTB Flotilla was moved from HMS Hornet to HMS Mantis at Lowestoft in August 1944. Shortly after arriving at Lowestoft, the five surviving boats of the 1st MTB flotilla were joined by a new 71½ft Mark VI boat. Further new boats arrived in September 1944 bringing the flotilla strength back up to ten boats. During the period 21 October to 29 November 1944, she was slipped, and repairs were carried out at Brightlingsea.

Briefly at ease in the Assault Area, June 1944. Left to right: Lt. Cam Gough (416), Lt. F. Head (414) and Sub.Lt. G Baptie (1st Lt 416) on bridge of 416 of 1st. Flottila (Courtesy F.S.Large)

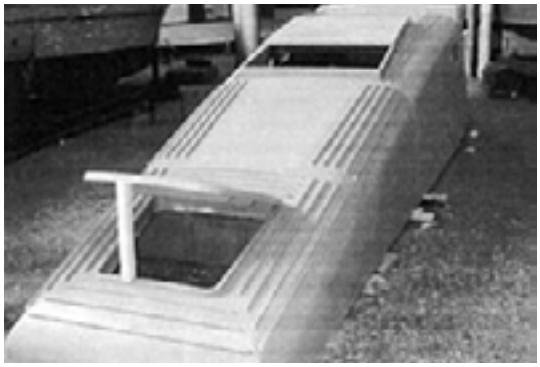
She was once again back in action and on the 14th February 1945 at Ostend, she escaped damage when a fuel spillage in the harbour was accidentally ignited and five of the Canadian flagged MTB's where destroyed and 26 Canadian sailors lost their lives in the fuel fire and explosions which engulfed them. On the 5th March 1945, MTB 416 and two other craft were laid up in Reserve at Poole. She was Paid Off on the 27th April 1945 and handed over to the Director of Small Craft Disposals at Poole on the 25th October 1945. Following initial sale little is known of her history until 1958, when she was arrested by the HM Customs at Shoreham having been caught during smuggling operations. She was subsequently sold by the Admiralty Marshall to a Gosport scrap dealer, who removed her engines and running gear. Following use as an accommodation barge for a sailing school in Gosport she was sold and became a houseboat. In January 1988 she was bought by a Mr Webster and restoration began in Bursledon. In September 1998 she was acquired by Philip Clabburn, for Powerboat Restorations, and taken to the Army base at Marchwood. She was lifted out of the water at Marchwood Military Port and placed in an area set aside by the Army authority where some stripping out prior to rebuilding could be done safely. Work started in May 1999 and included stripping out the boat's interior, replacing some of the deck and removing the superstructure.

On the 23/24 September 1999 MGB 81 was lifted on to a universal trolley and moved the short distance from Marchwood Military Port to the BMPT site at the former Husbands Shipyard where restoration continued. Over the next two years the hull was sand blasted both internally and externally and all damaged and non-standard planking. A completely new superstructure was fabricated from copies of the original BPB plans and efforts were made to acquire new engines

Arrival at Marchwood

New decks

Inverted for outer bottom work



New Superstructure

Several enquiries were made, and some Packard engines were found in Gibraltar. However Powerboat Restorations felt that petrol engines would be too expensive to run as a result three MAN diesel engines were acquired for fitting in the craft. An extension was built onto the ex-Husbands Shipyard sheds at Cracknore Hard to house the MGB whilst restoration took place. This is where I first became involved with her.

In the years that followed, as with HSL 102, she was acquired by the Portsmouth Naval Base Property Trust and in 2021 – 2022 she was refitted and refurbished at Berthon Boatyard in Lymington, a major undertaking funded by the UK government. The refit stripped her systematically from stem to stern, replacing the frames floors and longitudinal stringers to maintain the hull form and keep her as original as possible. The three MAN 835hp engines were replaced with three new FPT C13 825hp diesel engines. Also included in the work package were some sympathetic changes which were undertaken to prepare her for commercial compliance, without unduly changing her profile. See below...

MGB 81 World War II gunboat test drive review -a 14 minute YouTube videos - go to **https://bit.ly/3yTw3If**.

The IIMS Certifying Authority subsequently certificated her to CAT 4 which allows her to be used commercially for those interested in experiencing a working piece of wartime history. This is somewhat safer than when she first came into service when you consider that in common with land based tank crews these amazing guys operated next to screaming hot engines, with huge tanks full of petrol and explosive ordinance while firing guns and being on the receiving end of enemy fire.

ST 1502

Vessels Details:

Type:	41½ ft Seaplane Tender
Service:	RAF
Builders:	British Power Boat Co.
Year Built:	1942
Number Built:	87
Displacement:	5.0 Tons
Length:	41½ ft
Beam:	11¾ ft
Draught:	2¼ ft
Hull:	Mahogany
Engines:	2 x Perkins 56M 130hp diesels
Max Speed:	23 knots

Designed by George Selman (the same designer as MGB 81), this craft was built in Hythe by British Power Boats in 1942. During the early part of the war, 1502 and a few others of this type were armed and fitted out for Air Sea Rescue duties.

ST 1502, Yard No. 1888, was the third craft of the third batch of this type to have been built by BPB at their yard in Hythe. The craft was taken on charge by the RAF on 24th March 1942 and immediately despatched to be used by 51 Air Sea Rescue Unit (AS RU) under control of Coastal Command at Penrhos and Pwllheli in Wales. The tender remained based at the unit for virtually all of her WWII service before being transferred in July 1945 to No 56 ASRU based at Portaferry. In October 1945 she was moved to Invergordon/Alness in Scotland. After the war she was given a roll change to Range Safety Launch. In 1950 1502 was upgraded to Mk 1A specification at Calshot and returned to Invergordon/Alness until she became surplus at the end of 1955. She was subsequently offered for disposal as lying at the RAF base at Calshot and sold into private ownership in 1956. She fell into disrepair and was donated to the BMPT by her then owner Dave Wright and was brought by low loader to Marchwood arriving at the site on 24th September 1999, which is where I first became involved with her. Here she was virtually re-built by ex RAF sailors from the Air Sea Rescue & Marine Craft Sections Club, (Hants & Dorset Branch). In 2009 she was moved to her new home at Portsmouth Naval Base.

Between 2014 and 2016 I surveyed her and eventually coded her to Cat 5 on behalf of the IIMS.

Recently I have become involved with another vessel MASB 27. (below)

Above is an LCVP (Landing Craft Vehicle Personnel) also part of the commercial fleet at PNBPT. She is F8 (an HMS Fearless vessel). Amphibious Assault ships HMS Fearless (F) and HMS Intrepid (T) carried four each in davits. RM Poole (P) kept the remainder in a training and rotational maintenance system. In 1983 immediately after the Falklands War I volunteered for further training from Mechanical and Electrical Engineer to Ad Hull (Shipwright) and my first posting was to Royal Marines Poole repairing and refitting these plywood landing craft following their active service in the beach landings having been launched from Fearless and Intrepid during the assault.

MASB 27 was built as a coastal defence gunboat in 1941 by the British Power Boat Company at Hythe. She is of double diagonal construction in Honduras mahogany. She served in the Second World War as a Motor Anti-Submarine Boat, deployed also on air-sea rescue duties as well as clandestine operations off the Brittany coast. Prior to D-Day she was used for reconnaissance along the Normandy coastline, especially to take sand samples to check on beach load-bearing capacity. Then in June 1944 she was deployed in support of the US Army assault on Omaha Beach.

Owned by the charity D Day Revisited under the guidance of Mr John Phipps, she is currently undergoing restoration with a view on completion to joining the other craft covered in this article in the care of Portsmouth Naval Base Property Trust.

Above is another Vessel RSL 1668 (Range Safety Launch) surveyed in 2020 and now undergoing refurbishment at PNBPT.

My thanks go to BMPT, PNBPT, and D Day Revisited for their permission to publish some of their researched history and photographs.

Decarbonisation + Alternative Fuels FAQs

By Eva Kelesidou,
Senior Claims Executive, Standard Club

The Standard Club has produced a document in order to answer in a brief but comprehensive manner a number of questions that are frequently asked relating to decarbonisation and alternative fuels. The club's internal Alternative Fuel Working Group, in collaboration with the club's Advisory Panel consisting of external experts, has been monitoring the developments associated with the decarbonisation of the shipping sector and has been providing solid advice and guidance.

1. A brief overview of the current situation...

The maritime industry is embarking on a major transition from conventional to zero or carbon neutral fuels driven by the pressure to decarbonise. The transition will not take place overnight and will have a significant impact on costs, asset values, and earning capacity. The industry participants will need to understand the drivers and implications now to be able to plan accordingly and assess the associated risks.

Whilst regulations will set direct requirements that shipowners must comply with, the public as well as third-party stakeholders (including governments, classifications societies, ports, shipyards, banks and cargo owners) will increasingly have high expectations that will require transparency and promote decarbonisation. Access to finance for newbuilds will also be dependent on shipowners being able to demonstrate that they can meet decarbonisation targets.

2. Why are alternative fuels being considered by the industry?

The International Maritime Organization (IMO) reports that maritime transport is responsible for about 3% of global greenhouse gas (GHG) emissions (IMO Fourth GHG study). To reduce emissions and align international shipping with the temperature goals under the 2015 Paris Agreement,**[1]** the IMO adopted an Initial Strategy in 2018 on the reduction of GHG emissions from shipping (i.e. emissions including carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O), expressed in CO2e (carbon dioxide equivalent)). The Initial Strategy is a policy framework which sets key objectives to:

- reduce average carbon intensity (carbon dioxide (CO2) emissions per transport work) of international shipping by at least 40% by 2030, while pursuing efforts towards 70% by 2050, as compared to 2008 levels; and
- reduce total annual GHG emissions from shipping by at least 50% by 2050 compared to 2008, while pursuing efforts towards phasing them out entirely within this century.

The short, mid, and long-term measures to achieve these objectives remain a topic under intense discussion. The Initial Strategy is expected to be revised in 2023.

The use of alternative fuels is considered key to achieving the Initial Strategy goals because, whilst other energy efficient measures might achieve some reduction in GHG emissions, alternative fuels will be transformative and ultimately are capable of significantly reducing, if not eliminating, such emissions.

[1] The Paris Agreement excluded shipping due to its international scope. Climate-related shipping regulation was delegated to the IMO.

3. What are GHGs?

GHGs trap heat in the earth's atmosphere. Whilst carbon dioxide is the dominant GHG for shipping, GHGs include a basket of six harmful gases:

- Carbon dioxide (CO2), Methane (CH4), Nitrous oxide (N2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF6) and Nitrogen trifluoride (NF3).

4. Is the IMO Initial Strategy regime mandatory? If so, how will it be enforced?

The Initial Strategy itself is not mandatory. However, the IMO can adopt measures to implement the Initial Strategy by amending existing conventions which are mandatory in many jurisdictions (such as the International Convention for the Prevention of Pollution from Ships (MARPOL).

The requirements imposed by the revisions to MARPOL (see paragraph 5) are mandatory for all cargo and cruise vessels trading internationally and which are above the gross tonnage specified in the amendments and registered in a MARPOL-signatory country. Enforcement of such amendments will be through flag states which are parties to MARPOL.

5. Has the IMO adopted measures in furtherance of the Initial Strategy objectives?

Yes. In June 2021, the IMO's Marine Environment Protection Committee (MEPC) held its 76th session (referred to as 'MEPC 76') and adopted measures aimed at the Initial Strategy objectives. These measures include amendments to Annex VI of MARPOL.

The revised Annex VI requires ships over 400 GT and operating internationally to calculate their Energy Efficiency Existing Ship Index (EEXI). The EEXI is a design rating which will reflect the ship's energy efficiency as compared to a baseline target for ships of that type and size. The EEXI requirements are in addition to the existing Energy Efficiency Design Index (EEDI) requirements which are applicable to the design and construction of new ships (see paragraph number 7). The EEXI baseline target for a vessel will be based on a reduction factor expressed as a percentage relative to the EEDI baseline set for new ships of the same type and size. Existing vessels will be required, among other things, to have an actual calculated EEXI ('attained EEXI') below the targeted EEXI ('required EEXI') for the vessel. The EEXI requirements do not mandate modifications to existing ships, but realistically, modifications may be necessary to achieve the required EEXI for a particular ship.

MARPOL Annex VI also requires ships over 5,000 GT to establish an annual operational carbon intensity indicator (CII) and rating. Shipowners must calculate annually a CII for each ship accounting for cargo carried. The CII rating scale will be A, B, C, D, or E (with A being the best). The CII scale will require progressively higher efficiency standards each year, through 2030. Shipowners therefore should also develop plans to cut the CII to reach the progressive ship-specific targets whereby the CII of a ship is reduced annually. The flag state will compare a ship's reported CII to its target and produce the CII rating. A ship rated D for three consecutive years or E (on one occasion) will be required to submit a corrective action plan to show how a rating of C or above will be achieved.

6. What is the timeline for implementation of the EEXI and CII measures adopted by the IMO?

As explained in paragraph 5, the EEXI and CII regulations were adopted in 2021 through revisions to MARPOL Annex VI. The amendments are expected to enter into force on 1 November 2022, with the EEXI survey requirements taking effect in November 2022 and the EEXI and CII certification requirements coming into effect from 1 January 2023. The first annual EEXI and CII reports will accordingly be due in 2023. The EEXI and CII measures will then be reviewed by the IMO for effectiveness in 2026.

7. What is the EEDI?

The Energy Efficiency Design Index (EEDI) reflects the theoretical design efficiency of a new build ship.**[2]** EEDI was made mandatory with the adoption in July 2011 of amendments to MARPOL Annex VI. The EEDI regulations mandate a minimum required energy efficiency level per capacity mile (e.g., tonne

mile) for different ship types and sizes. The EEDI requirements are to be implemented in phases. New container ships, general cargo ships, LNG carriers, large gas carriers (>15,000 DWT), and cruise ships (having non-conventional propulsion, are all subject to the Phase 3 EEDI requirements from 1 April 2022. For most other ships, Phase 3 comes into force in 1 January 2025.

[2] *As per IMO Resolution MEPC.203(62), 'new ship' means a ship:*

1. *for which the building contract is placed on or after 1 January 2013; or*
2. *in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 July 2013; or*
3. *the delivery of which is on or after 1 July 2015.*

8. Are the EEXI, EEDI, and CII measures enough to hit the lower emission targets in the IMO's Initial Strategy?

Some experts believe the 2030 target can be achieved through the EEXI, EEDI, and CII measures. However, it is widely accepted that much more will need to be done to meet the 2050 targets. In particular, the adoption of alternative fuel technologies is required.

9. Is there a possibility that the IMO's GHG strategy will be revised?

Yes. Delegates at the 2021 United Nations Climate Change Conference (COP26) called for the shipping community to go further than the Initial Strategy and to aim for net zero by 2050. This was re-iterated at the seventy-seventh session of the Marine Environment Protection Committee (MEPC-77) held from 22 to 26 November 2021. Some member states expressed the view that the short-term measures adopted by MEPC-76 in June 2021 are inadequate to address the Paris Agreement temperature goals and that more efforts are needed. Consequently, MEPC-77 agreed to continue the discussions on mid and long-term measures and to initiate a revision of the Initial Strategy. The final draft of the Revised Strategy is expected to be considered for adoption by MEPC-80 (scheduled for spring 2023).

10. Are there regional or national efforts to address GHG emissions and the use of alternative fuels?

Yes, in some regions (i.e., EU) and it is likely more will follow.

The European Union - The EU is moving ahead with its own plan to reduce GHG emissions from the shipping sector. For example, since 2018, large ships over 5,000 GT loading or unloading cargo or passengers at ports in the European Economic Area have had to monitor, report, and verify CO2 emissions (EU-MRV). Further, in July 2021, the European Commission announced its 'Fit for 55' package of proposals. The proposals are intended to reduce the EU's total GHG emissions by 55% by 2030 with the goal of complete decarbonisation by 2050. The proposals are subject to further discussion and negotiation with the European Council and European Parliament and are thus not yet finalised.

In their present form, four of the 'Fit for 55' proposals are relevant to shipping:

- **Emissions Trading System (ETS):** The package proposes incorporating shipping in the EU's ETS from 2023. The proposal would mandate those ships that operate within EU waters to pay for their carbon emissions with the proceeds going toward development of infrastructure for cleaner alternative fuels. The extension would apply to emissions from intra-EU voyages, to 50% of the emissions from extra-EU voyages, and to emissions from ships while at berth in EU ports. Non-compliance will result in fiscal penalties being applied and may eventually lead to the ship being banned from EU waters.
- **Alternative Fuels Infrastructure Regulation:** This proposed regulation will require EU member states to provide adequate recharging and refuelling infrastructure which will effectively involve ramping up the availability of LNG by 2025 and onshore electrical power by 2030 in core EU ports. The introduction of this regulation will involve repealing Directive 2014/94/EU on the deployment of alternative fuels infrastructure.
- **Energy Taxation Directive:** This proposal would remove the tax exemption for conventional fuels used at and between EU ports as of 1 January 2023. The tax exemption presently in place for international bunkering for extra-EU voyages will remain. The tax rate for heavy fuel oil will be approximately €37 per tonne whereas the tax rate for LNG will initially be €0.6 per gigajoule. Alternative fuels will be tax exempt for a 10-year period.
- **FuelEU Maritime Regulation:** The proposed regulation would impose limits on GHG emissions (including CO2, methane, and nitrous oxide) of ships of 5,000 GT and above, regardless of their flag, arriving or departing EU ports and an obligation on EU ports to become carbon neutral. If adopted, the regulation will require ships to reduce their annual GHG intensity by 2% in 2025 as compared to 2020 levels with incremental increases over the years to achieve a 75% reduction by January 2050.

The United States - President Biden announced in April 2021 that the United States (US) will join the IMO effort to reduce GHG emissions in international shipping. He suggested that the US will aim to achieve net zero GHG emissions by 2050, with an interim goal to cut GHG emissions by 50% by 2030 (compared to 2005 emission levels – which was a peak year for emissions in the US). The US has not, to date, enacted its own specific measures for achieving such GHG emission reduction targets.

However, individual states may pursue their own measures. For instance, California modified a regulation in 2020 which will require every vessel calling at a regulated Californian port either to use shore power or a technology approved by the California Air Resources Board to reduce specified emissions. The regulation (known as the 'At Berth' regulation) currently applies to container ships, reefers, and cruise ships. The updated regulation applies as of 2023 when container

ships, reefers, and cruise ships will transition to the new regulation. Car carriers will need to comply starting in 2025. Tankers calling at the Ports of Los Angeles and Long Beach must comply as of 2025, and tankers calling in Northern California will have to comply as of 2027.

11. Which alternative fuels are being considered for international shipping?

As matters stand, the main alternative fuels being considered include liquefied natural gas (LNG), liquefied petroleum gas (LPG), hydrogen (H2), ammonia (NH3), methanol (CH3OH), and biofuels. However, see also paragraph 12.

12. What are the advantages & disadvantages of each type of alternative fuel?

The table below provides an overview of advantages and disadvantages of the main alternative fuels being considered for the shipping sector:

13. What about electricity, wind, or solar power as alternative energy sources?

In recent years, pure battery-electric propulsion, using lithium ion (Li-ion) batteries, has been successfully applied on small, short-sea vessels. Presently, range limitations on the use of electricity make it unsuitable for most ocean-going applications. The potential for batteries in combination with a two-stroke main engine in a hybrid system is being evaluated for larger ocean-going vessels.

Wind and solar technologies are also being considered in conjunction with the use of other technologies (see paragraph 21).

14. Which fuel(s) is/are likely to become the main alternative fuel?

There is no one-size-fits-all solution. Various factors will have to be considered in selecting an appropriate fuel type based on vessel type, age of the ship, trading area, retrofitting costs, operating budget, fuel price/availability, infrastructure development, etc.

Choosing the right fuel strategy is one of the most important decisions an owner will have to take for a current new build. The key will be to optimise the fuel storage and propulsion system of the ship to accommodate current and future fuel requirements. A vessel built now faces a significant risk that the most competitive fuel in the ship's early life will not be the same subsequently.

15. What are owners doing in terms of new buildings and what is the outlook?

The industry reports there is an increase in newbuilds on order that have alternative fuel systems or dual-fuel capabilities. Except for electrification in the ferry segment, the alternative fuels being used are still mainly fossil based and are dominated by LNG.

Alternative Fuels	Advantages	Disadvantages
Liquified Natural Gas (LNG)	■ Already in practical use ■ Infrastructure being developed ■ Lower in cost as compared to traditional marine fuels ■ High energy density ■ Specific regulations for LNG in IMO's International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code)	■ Commonly known as a 't ransition fuel' as reduction of CO2 emissions is limited ■ Requires a temperature of -162C to stay in liquid state ■ Low volumetric density (storage takes nearly twice the space of traditional marine fuels) ■ Bunkering, storage and handling requires much more care than traditional marine fuels ■ Methane slip (GHG impact 25 t imes greater than CO2 emissions) ■ Possible criticism for the use of fossil fuel
Liquified Petroleum Gas (LPG)	■ Lower in cost as compared to traditional marine fuels	■ Similar to LNG, reduction of CO2 emissions is limited ■ As with LNG, LPG storage requires larger tanks ■ limited operational experience ■ Lack of bunkering infrastructure ■ Slippage factor (GHG impact 3-4 t imes higher than CO2 emissions) ■ Possible criticism for the use of fossil fuels
Biofuels	■ Commonly used biofuels are hydrotreated vegetable oil (HVO) and biodiesel (FAME, fatty ■ acid methyl ester) ■ Carbon neutral - derived from biologically renewable resources such as plant-based sugars, etc. ■ Usually blended with traditional marine fuels or used as a 'drop-in' fuel, compatible with current conventional marine engines.	■ Higher in cost as compared to many fossil fuels ■ Technical issues that could lead to machinery breakdown if not managed property - storage stability, biological growth (biofouling), acidity, plugging of filters, and increased engine deposits ■ Limited production capacity and availability

There will be demonstration projects for onboard use of hydrogen and ammonia by 2025 paving the way for zero-carbon ships, and these technologies may be ready for commercial use in four to eight years. Methanol technology is more mature and has already seen first commercial use.

A range of new technologies are emerging including fuel cells, carbon capture, and storage (CCS), as well as wind power.

As owners consider these and other technologies for their newbuilds, they will be evaluating the economic potential of fuel and energy-efficiency strategies over the lifetime of a ship. This will entail a review of the impact of the chosen fuel strategy on ship design. Considering the significant uncertainties involved over the lifetime of a ship, they will need to focus on fuel flexibility and fuel ready solutions to ease the transition and minimise the risk of investing in stranded assets.

16. What about safety?

Ensuring safety is of paramount importance in achieving the successful and timely roll out of new fuels such as hydrogen and ammonia. The development of safety regulations and guidelines will be necessary to evolve from large scale demonstration models to commercial use.

IMO's International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code) addresses standards for ships using low-flashpoint fuel in general, but the current version focuses on regulations to meet the functional requirements for gas fuel (LNG). During the 7th session of the IMO Sub-Committee on Carriage of Cargoes and Containers (CCC-7), which was held from 6 to 11 September 2021, a work plan was agreed for the development of provisions for new low-flashpoint fuels under the IGF Code, including hydrogen, ammonia, LPG and methyl/ethyl alcohols.

17. Are some alternative fuels better suited for certain ship types or trades?

For a fuel to become widely used, it must have adequate scalability, i.e., both the infrastructure and the demand must be there, and it must be generally price competitive for take up. This may be easier to achieve for ships on regular liner routes. Those travelling between ports (i.e., bulk vessels on tramp trades) will have a difficult time sourcing the scarcer options.

18. Are alternative fuels presently available in key world ports? It not, when will they be?

LNG is presently the most readily accessible alternative fuel but is still not easy to source and certainly not carbon free. LNG (Bio-LNG and E-LNG) and Biofuels are good options for transitional fuels.

Methanol is only available in limited areas and is not yet in sufficient quantities to satisfy the requirements of the industry.

For the other alternative fuels under consideration, testing, development and creation of associated infrastructure is still on-going and they are not yet readily available.

19. What are the overall risks and impact to vessel operations associated with the use of alternative fuels?

A myriad of risks and costs considerations arise when selecting and using an alternative fuel. Some of these are identified in the table above. The principal risks and challenges concern crew safety, energy output compared to storage requirements onboard, and the availability of bunkering facilities.

Biofuels bring technical challenges concerning oxidation stability, cold flow properties, risk of microbial growth, clogging of filters, and increased engine deposits. They thus require careful handling.

During the 9th session of the IMO's Sub-Committee on Pollution Prevention and Response (PPR-9), held on April 2022, it was agreed clarity on the use of biofuels on board ships is required. The Unified Interpretation provides a definition for the term "biofuel" and indicates that a fuel oil which is a blend of not more than 30% by volume of biofuel should meet the requirements of regulation 18.3.1 of MARPOL Annex VI, while a fuel oil which is a blend of more than 30% by volume of biofuel should meet the requirements of regulation 18.3.2 of MARPOL Annex VI. This will be presented for approval by MEPC-78.

Gases in liquid form typically require storage at cryogenic temperature and specific safety standards will need to be satisfied. Hydrogen, for example, has a wide flammability range, while ammonia is highly toxic. Stringent measures will be required to protect crew from harmful exposure, and training will be required.

Hydrogen is a clean fuel, however, manufacturing it is energy-intensive and may have carbon by-products. What is now called brown hydrogen is created through coal gasification. The process for producing grey hydrogen from natural gas releases carbon waste in the atmosphere. Blue hydrogen utilises the same process that is used to produce grey hydrogen but with carbon capture and storage, and hence it has a lower environmental impact as compared to grey hydrogen. Green hydrogen production, although currently expensive, is seen by many as the ultimate solution and uses renewable energy to create hydrogen fuel.

Green ammonia will cost two to four times as much to make as conventional ammonia. The green and blue ammonia value chains differ in the hydrogen production method used. Green ammonia is generated from water electrolysis while blue ammonia is generated using natural gas, with the addition of carbon capture.

In terms of storage capacity, energy density/calorific value of the fuel is critical. More storage space on the ship will be required if a fuel does not have an energy density that is at least comparable to that of traditional fuel. Hydrogen, ammonia, and methanol, for example, all have a lower density, requiring larger storage tanks onboard ships.

20. Considering the current lack of alternative fuel infrastructure, and the absence of a present clear 'winner' amongst

the alternative fuel options, is there another fuel option to consider in the interim?

Possibly. A transitional fuel created by using additives or blending other products with traditional fuel or LNG (which is more readily available now than other alternative fuels) might be an option for reducing vessel GHG emissions while more permanent solutions are considered. An example is LNG with 20% hydrogen. Different transitional fuel choices are likely to be available depending on the vessel and trade. Such transitional fuels may require modifications to the vessel and carry their own risks

22. Should shipowners consider contractual clauses to address carbon emissions regulations and alternative fuels?

The EEXI/CII regulations, the use of alternative fuels, and other environmental regulations towards shipping's decarbonisation are likely to impact the performance of both existing and future contracts and the traditional rights and obligations of the parties involved. Commercial and legal challenges are likely to emerge and create disputes which are varied and complex.

Shipowners should be discussing with their counterparts over the allocation of responsibility, risks, and associated costs in terms of compliance with the various environmental proposals and regulations currently discussed amongst the industry and those that will emerge. Collaboration would be advisable so that a strategy is agreed with regard to compliance, enforcement, sanctions, and associated commercial consequences. In the same direction, the parties to the shipping contractual chain should consider and address within their contracts the risks and exposure connected to third party claims as well as any impact on insurance coverage. Other problems which may arise could be in terms of alternative fuels' availability in the ports around the world; a carefully considered clause could reduce potential disputes between the parties.

21. What are some of the technologies or vessel modifications that shipowners can consider in addition to or apart from the use of alternative or transitional fuels?

Many emerging technologies and potential vessel modifications are being considered including the following:

Energy efficiency technologies (EETs)	
Hull form optimisation	Hull optimisation focuses on minimising the wave resistance and friction between water and hull. The reduced frictional resistance increases energy efficiency of the ship, particularly at reduced speeds. Below are ways in which hull hydrodynamic performance may be improved: ■ Fore body (bow) optimisation ■ Aft body optimisation ■ Appendage Resistance Optimisation measures are generally applied on new-built ships but also in the retrofitting of existing ships. However, it is important to understand in detail the ship's performance and its operating profile before considering any design modification. Usually, a comprehensive series of model tests and computational fluid dynamic (CFD) assessments are required in such cases. When considering hull form optimization, it is beneficial to include sister ships in the CFD analysis to reduce the cost for the fleet.
Hull coatings	One way of lowering the frictional resistance is to improve the smoothness of a hull by means of coatings that reduce fouling. In recent years there has been a lot of development in the coating technology, e.g. introduction of hydrogel, a component that traps a microscopic layer of water on the coating's surface, smoothing the water flow around the hull. The use of hydrogel containing coatings makes the surface of the hull behave like a liquid on a microscopic level. This not only deters fouling from occurring in the first place, but also significantly reduces hull friction.
Air lubrication	Air lubrication is a method to reduce the frictional resistance between the ship's hull and water using a sheet of air or air bubbles. This saves energy and cuts down on fuel consumption. An automation system regulates the compressors/blowers depending on speed. In ideal situations, an air injection system can achieve up to a 15% reduction of CO2 emissions together with significant fuel savings. As compared to ships with v-shaped bottoms, this system is more effective on flat bottoms as the air on a v-shaped bottom will flow away more easily than on a flat bottom.
Propellers and rudders	Numerous devices have been designed for improving the ship's energy efficiency by recovering as much as possible of the rotational energy in the flow from the propeller, or to provide some pre- or post-rotation of the in-flow into and after the propeller to ensure best performance.
Propellers and rudders	Numerous devices have been designed for improving the ship's energy efficiency by recovering as much as possible of the rotational energy in the flow from the propeller, or to provide some pre- or post-rotation of the in-flow into and after the propeller to ensure best performance.
Electric (battery powered) propulsion	In recent years, pure battery-electric propulsion, using lithium ion (Li-ion) batteries, has been successfully applied on small, short-sea vessels. The potential for batteries in combination with a two-stroke main engine in a hybrid system is being evaluated for larger ocean-going vessels.

Traditional time charters are expected to be most impacted however this does not mean that voyage charters will not be significantly affected. COAs and bareboat charters may also be impacted.

BIMCO has already published a clause which addresses compliance with EEXI and allocates responsibility and costs for implementing modifications and is suitable for both existing and future time charter parties. This clause, the EEXI Transition Clause For Time Charter Parties 2021, may also be used to address other energy saving technical measures that may be implemented to achieve compliance. However, such use of other energy saving measures is subject to agreement between the parties. BIMCO is also currently working on charterparty clauses addressing the EU Emissions Trading Scheme and carbon intensity indicator (CII) regulations.

As the number of LNG fuelled ships is growing BIMCO has also drafted three LNG clauses covering matters related to LNG fuel quality, fuel delivery/redelivery, gas-freeing and cooling down and an operational clause. The following clauses have now been published:

a) LNG Bunker Operational Clause for Time Charter Parties

b) LNG Fuel Delivery Clause For Time Charter Parties

c) LNG Fuel Gas freeing and Cool down Clause

d) LNG Fuel Quality Clause

Energy efficiency technologies (EETs) *continued*	
Hydrogen fuel cells	Hydrogen fuel cells work in a similar manner to an electric battery, i.e., they convert chemical energy into electrical energy using the movement of charged hydrogen ions across an electrolyte membrane to generate current. There they recombine with oxygen to produce water – a fuel cell's only emission, alongside hot air. They do not deplete or need charging and have a higher power density and lower weight than batteries. However, they are expensive and any leakage, if not handled properly, may cause hydrogen accumulation and explosion. Therefore, the hydrogen storage place and fuel cell cabin require appropriate measures to ensure safe integrity levels.
Shore to ship power (cold ironing)	This is the process of providing shoreside electrical power to a ship at berth while its main and auxiliary engines are turned off. When a ship is in port, auxiliary engines (generators) are commonly used to provide power for cargo operations, emergency equipment, cooling, heating, lighting as well as for domestic use. By simply turning off generators and plugging in to an electrical supply point in the ports, fuel consumption saving and subsequently reduction of noise and air emission may be achieved. Smaller vessels with low power requirements can make use of normal grid voltage and frequency. However, for larger vessels with high power requirements only limited ports may be able to provide cold ironing.
Waste heat recovery systems	A waste-heat recovery system (WHRS) recovers the thermal energy from the exhaust gas and converts it into electrical energy, while the residual heat can further be used for ship services (such as hot water and steam). The system may consist of an exhaust gas boiler (or combined with oil fired boiler), a power turbine and/or a steam turbine with alternator. Redesigning the ship layout can efficiently accommodate the boilers on the ship. There is potential for a reduction in main engine fuel consumption estimated at 3% to 8% which will contribute to overall emissions reductions. Waste heat recovery is well proven onboard ships, but the potential is variable depending on the size, numbers, usage and efficiency of the engines on board. Furthermore, these measures are usually not relevant for retrofitting, due to large costs and efforts related to redesign, steel work, extra weight, etc.
Carbon capture and storage	This technology is at the very early development stage for ships. It involves the isolation and capturing of carbon emissions from the ship's exhaust and preventing them from entering the atmosphere. However, suitable cryogenic storage tanks are needed to collect liquid cargo until the ship reaches port. Thereafter, the carbon can either be stored permanently underground in geological formations or utilised in carbon-consuming industries.
Solar panels	Solar panels are devices that convert light from the sun into electricity. Solar panels on ships are not common at present, but some installations have been installed on certain types of ships including car carriers, bulkers, passenger ferries and smaller domestic vessels by using marine grade solar panels. This solution may not suit container vessels because of the space required. The technology is in its infancy and is expected to become less expensive over time, but the panels are unlikely to become much more efficient or less space consuming.
Wind assisted propulsion systems	Wind-assisted propulsion systems (e.g., sail, kite, fixed-wing, Flettner rotors) utilise an old concept with a modern edge. The IMO has recognized this technology and included the effects of wind propulsion in MEPC.1/Circ. 815. However, it is considered as an auxiliary propulsion system that augments the primary propulsion system. In fact, most wind-assisted propulsion systems require a secondary source of energy to be operated. For example, Flettner rotors need to be started up by motors to develop their aerodynamic thrust forces. Clearly, the availability of wind is the most relevant factor for these systems to work well. Operational costs (maintenance, spare parts, replacement of components, etc.) need to be considered in addition to the fuel saving potential.

The parties may also wish to consider the various "climate" clauses published by the Chancery Lane Project which is a not-for-profit organisation where lawyers can collaborate to draft industry appropriate clauses. Amongst those relevant to shipping are clauses dealing with (i) maximising energy efficiency, (ii) incentivising fuel efficiency, (iii) fuel reporting etc.

A clause dealing with the use of alternative fuels is likely to be the next on the agenda for most future contracts and not just for BIMCO.

The club is providing assistance in terms of reviewing and commenting on charter party clauses with regard to how the costs and risks of complying with new measures might best be allocated between the parties.

23. What are the industry bodies doing on this topic?

Various industry bodies including IG, BIMCO, classification societies continue to monitor developments and provide guidance to the shipping community.

24. How is the club supporting members with their transition?

It is not the role of the club to tell members which alternative fuel strategies they should be adopting. That is a complex commercial decision for them. Rather, the club is focused on supporting and guiding its members through the transition, particularly in respect of risk issues, claims advice, loss prevention, and underwriting queries.

As mentioned in the introduction, the club has formed its own Alternative Fuels Working Group (AFWG) and a dedicated advisory panel (SAFAP) comprised of key professionals within the industry. The AFWG helps us to stay abreast of developments and allows us to develop our own internal expertise. It is busy preparing webinars on the subject and tailor-made presentations/briefings for members that request them.

SAFAP comprises representatives from key maritime bodies, shipowner organisations, professional advisory firms and members. SAFAP advises and informs the AFWG with the goal of sharing knowledge and assisting the club's membership through the energy transition.

The club is committed to helping members make a safe, sustainable and successful transition to greener energy solutions, in line with The Paris Agreement and the IMO's goals.

25. Are there any cover issues associated with the use of alternative fuels generally?

From a club cover perspective, clubs will need to consider matters pertaining to both (i) contractual obligations, such as deviation, and (ii) fines, such as those imposed for non-compliance with the MARPOL regulations. It is anticipated, though currently uncertain, that most cover-related issues will arise in respect of fines.

Other than in cases of purely accidental discharge, P&I cover for pollution fines and associated expenses has only ever been available on a discretionary basis. For a discharge to be accidental, there should be no intention to cause the discharge. Rather, the discharge itself must be accidental. Situations of accidental pollution are rare, and we anticipate this will continue with the advent of alternative fuels.

The club's board may exercise discretion in favour of the member if it is satisfied that the member took all such steps as appear to the board to have been reasonable to avoid the event giving rise to the fine. This involves a detailed scrutiny of the circumstances surrounding the offence, as well as an assessment of the environmental policies and procedures the member had in place.

There is no exclusion for any particular alternative fuel and a spill of an alternative fuel should involve similar considerations to a spill of a traditional fuel. As such, cover is anticipated to continue to support members using alternative fuels and to respond in the usual way to liabilities and claims arising from such fuels.

26. Will there be changes to the rules?

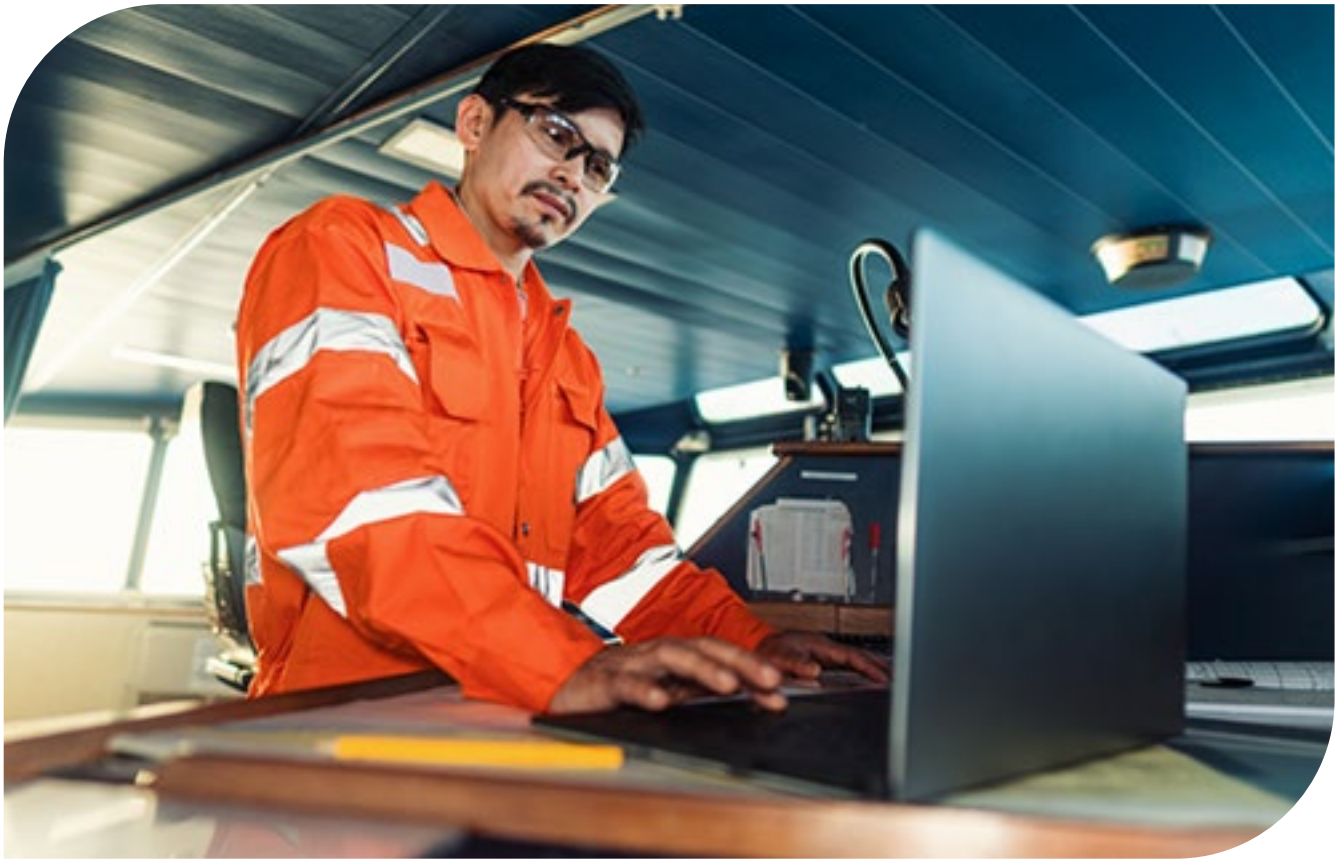
As developments in the alternative fuels space continue, there may be scope for additional cover or rule changes.

27. Does Standard Club have any recommendations for members at this time?

Members should be considering the different regulations that may apply to a particular vessel or fleet and the effective date of such regulations to ensure compliance. While the effective dates of the regulations is in some cases only months away, the steps for compliance require thoughtful deliberation and may require lengthy lead time for implementation. Contract reviews are highly recommended, and amendments may be required to mitigate the risk and cost of compliance. Overall, members should ensure they adopt a culture of adherence to the applicable regulations, embrace regular oversight and auditing of their compliance procedures, and maintain effective senior management oversight. Among other things, members will need to consider their overall fuel management strategy and policies, potential investment in vessel modifications and / or emerging technologies, and training of onboard and shore personnel. Members may also want to collaborate with experts and trading partners insofar as risk and cost allocation associated with GHG emission reduction practices.

Modernising the handling of Safety Management Systems for better efficiency

By One Ocean



Following several sea accidents during the late 1980s, there was widespread concern over maritime safety. The decade had seen a series of maritime incidents, the most serious one being the sinking of the Herald of Free Enterprise's Ro Ro Ferry as it sailed from Belgium to England. As a result, in October 1989 the International Maritime Organization (IMO) adopted resolution A 647 (16) which specified guidelines on management for the safe operation of ships and for pollution prevention.

Following this resolution, the IMO's International Safety Management (ISM) Code became mandatory with its entry into force on July 1, 1998. The ISM Code mandated that commercial maritime companies assess all identifiable risks to a company's ships, personnel, and to the environment, and establish appropriate safeguards. In short, ISM provides an international standard for the safe management and operation of ships at sea.

As an important element of the ISM Code, all commercial vessels are required to have a Safety Management System (SMS) in place to establish safe ship management procedures. The SMS must also include procedures for reporting accidents and any non-conformities with the ISM Code as well as procedures for preparing for and responding to emergency situations, and procedures for internal audits and management reviews.

In addition to the long list of SMS requirements, adherence is required also to the International Ship and Port Facility (ISPS) Code. This code represents a set of measures that enhance the security of ships and port facilities and was developed in response to the 9/11 attacks in 2001. Part of the Safety of Life at Sea (SOLAS) Convention, ISPS is mandatory for the 148 contracting parties to SOLAS. It requires shipping companies to assess any security-related information received, and to distribute it to the appropriate government contracting agencies. A proper communication protocol must be defined for ships and port facilities to ensure that the information exchange is without complications.

Rigorous Requirements

SMS requirements are manyfold and demanding. Constant attention to them is, therefore, necessary to maintaining full compliance. Any identifiable deviation from the SMS requirements that poses a serious threat to safety or risk to the environment requires immediate corrective action.

Such deviations can be easily overlooked. For example, a faulty fire alarm system, problems with the oil and water separator system, or an insufficient number of life rafts are potential safety threats that need to be addressed, reported, and documented. The validity of the documents is another challenge since any changes to the status quo require the documentation to be amended and updated accordingly. Such changes can include any number of things, including for instance, a ship's change of flag, amended safety precautions for different cargoes, or a change from standard lifeboats to free fall lifeboats.

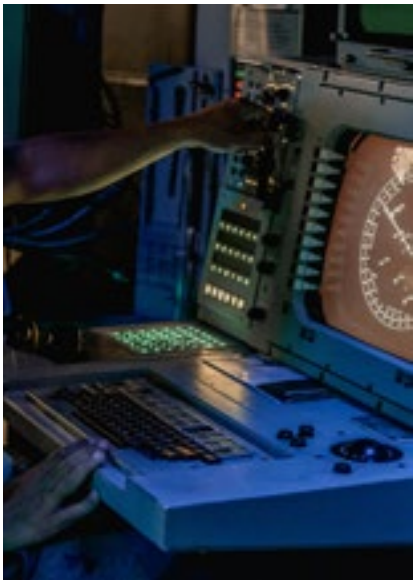
The main challenge is the pure volume of documentation demanded. All procedures need to be properly recorded and the documentation must be readily available to all relevant stakeholders. In times of heavy workload or difficulties in maintaining schedules, it is easy for errors or omissions in the reporting process to occur.

Challenging Audits

Audits, both internal and external, are taken to check on possible SMS deficiencies and non-conformities. They also measure whether vessel SMS' comply with ISM Code requirements. There is, however, no guidance as to how to carry out an internal audit, nor what it should include. The guidelines are focused almost entirely on the necessary procedures and documentation.

Internal audits are carried out at least once a year, the main objectives being to verify compliance with the regulations, to ensure that the SMS is being properly implemented, and to supervise actions taken to improve safety performance. The audit is headed by a designated shore-based person who issues a report on the findings. The company and the vessel personnel are required to act on the report, with both corrective and preventive actions taken. All such actions must be accurately documented.

A comprehensive SMS system also requires that shoreside teams have a high level of oversight of onboard activities. This, in turn, necessitates the constant exchange of documents between ship and shore, which can present a challenge, especially when vessels do not have consistent internet access.



The amount of documentation needed is likely to increase along with the growth in regulations. Environmental regulations in particular have grown considerably in recent years, and this growth is expected to continue as the IMO works towards 2030 and 2050 targets. This will add to the workload in accurately completing all required documents, and with that, will also increase the potential for human error to occur.

A Digital Way Forward

Manual documentation and handling of paperwork continues to be the standard and most common method for dealing with SMS requirements, despite the fact that digital technology is available to simplify and improve the efficiency of this task.

The most common reasons for non-compliance relate to manual documentation issues. Too often, negligence in following the latest requirements results in outdated procedures, checklists or work permits being used. Forms and checklists are sometimes improperly completed, and signatures can be missing. Incident reporting is not always properly processed, and records are sometimes unable to be produced for the auditor.

Approximately half of the audit protocol relates to documentation, and the majority of non-compliance observations are due to incorrect manual completion and handling of documents. Digital systems virtually eliminate this from happening and serve to speed the entire process.

A similar situation exists with ship surveys, which although mainly concerned with the technical condition of the vessel, also require that all documentation is in order. A digitalised handling mechanism eliminates the likelihood of documenting mistakes being made.

As more and more 'official' documents, such as class and statutory certificates and some flag registry certificates, are in digital format, it makes sense that SMS handling should be in digital format also. Furthermore, there are a few flag states, the Marshall Islands being one, that consider International Ship and Port Facility Security (ISPS) to be part of the ISM Code. In such cases, the audits for ISM, ISPS, and the Maritime Labour Convention (MLC) are usually carried out simultaneously, and there is a clear lack of efficiency if the documentation for each code is held separately in different locations. Digital solutions overcome this challenge.

Contrast such difficult and time-consuming manual handling with a holistic, digital system that is dynamic, inter-connected, and easily accessible by all stakeholders. Efficiency provided by digital technologies is driving change throughout the maritime sector, and perhaps nowhere is this change more needed than in the management of SMS requirements.

OneOcean website:
www.oneocean.com

Marine safety must never become a box-ticking exercise

Alistair Hackett, managing director of Ocean Safety, talks about the risks of a cost-conscious industry and how sailors need to make safety their real priority.

The last two years have been turbulent for the marine safety arena – as it has for many industries – however the future is positive, according to Hackett. "The core principle of the business has always been to supply knowledge, advice, solve problems for customers and provide top-of-the-range safety equipment. We must never become 'box shifters' of average quality product – there is too much average quality product in our industry," warns Hackett.

"Like everything in the world, safety equipment has become more and more cost conscious," he explains. "While the standards of regulation are constantly improving – which is a great thing – what we are finding is that more people are wanting to build product to the lowest cost possible that meets the regulation.

And whilst in some areas of the industry there is a definite market for that, this is safety equipment that we're talking about. We should be in a position as an industry where we constantly strive to make sure that all of the kit that the industry supplies to individuals is to the very best of its ability, the highest standard that can possibly be used afloat.

"So, you constantly have this battle within industry of what's cheapest but ticks the box and what is actually best suited for the environment it's going to be used in. And bear in mind that we are dealing with product that's very, very rarely used. "Don't get me wrong. You are far better to have the equipment than no equipment at all – everybody has to tailor the budget to their own desires," Hackett says.

While sailors can 'tick the box' and physically have the required equipment on board to enter a race, regatta or event, is it the best their budget allows for? And, crucially, have they spent the time understanding the equipment and does all the crew know how to utilise it effectively?

Hackett – and many marine safety experts – warn of the risks of consumer complacency whereby the public never believe an emergency afloat will happen to them. While the vast majority of sailors will cite safety as top of their priority list on board, Hackett says in reality the time spent learning about safety products, how to store, use and deploy them doesn't reflect this.

"I've had lots of discussions with people undertaking the Fastnet race, entering high-end yacht races or

families who are going off on some sort of major bluewater trip and when you talk to them about safety, they'll say it's right at the top. And yet, in reality, if they've just spent £25,000 on new sails and £15,000 on safety equipment, I can guarantee you that the crew will spend far more time trying to learn how to use their new sails to make the yacht go faster than they will do practicing man overboard and other safety drills."

"That's again where it falls into the 'it won't happen to me' bracket. And so you end up in this scenario where you are constantly trying to persuade people to take as much interest in maritime safety as they possibly can because you have to make sure that they understand that it might just be them who crashes into a container in the middle of Christchurch Bay and the boat sinks in two minutes. And when that happens, that is not the time to start learning how your safety kit works."

Hackett speaks from realms of experience – after sailing and racing all his early life, he got fully involved in the offshore marine industry in 1990 when he started work for Chay Blyth's The Challenge Business and went on to become logistics director for all four Global Challenge events, which lead to working with the team responsible for 51 circumnavigations over a 16-year period. In the role, he worked closely with Ocean Safety as the events principal safety supplier, which led to a natural progression into the marine safety industry in 2006. A member of the RORC Special Regulations Committee, he also sits on the World Sailing Safety Committee and during his time at Ocean Safety, Hackett has managed the safety training for the last four Volvo Ocean Races.

It's really important that people have a desire to want to learn how their safety equipment all works, which is why things like a sea survival training courses are so important and why talking to people is so critical.

"Buying the equipment is ten per cent of the story. The owner and everybody in the crew has to understand how that equipment works, when to use it, what are the implications of using it, and so on."

Despite safety equipment rarely being used onboard, Hackett believes: "It's incumbent on the industry that we all push as hard as we can to make sure that people understand the intricacies of using safety equipment. Because when we do have to use it, that is not the time to start reading the instructions. You've got to understand it right from the get go."

To move things forward and increase consumer awareness and maritime safety onboard, Hackett says more discussion and more practice is needed. He cites the RYA and RNLI's 'useless unless worn' lifejacket campaign as a hugely successful message that changed attitudes towards lifejackets.

"[The campaign] was just unbelievable and has transformed attitudes. Interaction with the products has just gone through the roof along with people's understanding of lifejackets and what they can do for individuals. Couple that with event organisers and regulatory bodies stating, 'right, you must wear a lifejacket to do this, or you must have lifejackets to do that', and all of a sudden the industry has seen a massive increase [in lifejacket use on the water]. And also a massive improvement in the design of the product – because if people have to wear lifejackets they want them to be comfortable and to look half decent. And secondly, because the rules say that they have to have them and they have to wear them in certain conditions it puts them in a position whereby they think okay, well if I've got this thing, I've got to wear it what do I have to do with it? How do I use it? When do I use it? How will it integrate with my integral AIS unit that was built into it? So it just promotes this discussion and advancement.

"We need to make sure that there are campaigns like that constantly running so that people understand what's involved in maritime safety," he adds.

Hackett says the leisure sector has some great opportunities as end users become more interested in their need for safety equipment. Developments in lifejacket technology will continue and how they integrate with more MOB electronics is coming to the fore. "As such a personal lifejacket will become more technical in design and use. The need to always produce smaller and lighter products will always be there so looking at new fabrics for liferafts and so on will continue. In addition, it is important that customers always get value for money so looking at extended periods of service for equipment is an interesting area however it is often difficult to justify due to the environment the equipment is stored in.

"Like most industries, protecting the environment is important and the inflatable products we use nearly all use large volumes of CO_2 to inflate them and the fabrics are mainly polymer-based. Working towards 'cleaner' products will always be at the forefront of development going forward."

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a most dangerous trade: the problems of liquefaction

"In a word, what [the master] was being offered was a wet wolf in a dry sheep's clothing and there was nothing to put him on notice that the cargo was something radically and fundamentally different from that which it appeared to be. In those circumstances it seems to me that the cargo was dangerous beyond all argument." *– Mr Justice Donaldson, 1968*

By David Richards, Director (Claim), North P&I Club

So said Mr Justice Donaldson in 1968 when dealing with a case where a master had been misled by shippers about the true moisture content of a cargo of iron ore **[1]**. In that case, the cargo, although appearing dry during loading, liquefied during the voyage causing the ship to put into a port of refuge and re-stow. The charterer was held responsible for the expenses incurred and for the payment of hire throughout, but the situation could have been much more lethal. It is estimated that more than 100 seafarers have lost their lives following cargo liquefaction. Delays arising from the discovery of cargo liable to liquefy can cost millions of dollars. Claims arising from the loss of a vessel due to liquefaction cost tens of millions of dollars and can cause considerable reputational damage.

What is liquefaction?

Liquefaction in the context of carriage of goods by sea describes the phenomenon whereby an apparently solid bulk cargo behaves in a manner similar to a fluid. Various mechanisms within the cargo mass contribute to liquefaction, including moisture content, degree of saturation, pressure within the particle pore spaces and the loss of inter-particle frictional force. Liquefaction can occur slowly over time or instantaneously without warning. 'Dynamic separation' can occur during a voyage whereby the cargo consolidates at depth, with moisture / fine particles in the cargo forced to the surface, flattening the

stow profile and creating a free-surface effect and cargo shift **[2]**.

The process is typically triggered by the exposure of the cargo to cumulative stress from ship motions during a voyage. Once a cargo has begun to liquefy or dynamically separate within the ship's hold, the process is irreversible, and the ship's intact stability may be adversely affected. Depending on the cargo and sea conditions, the vessel may capsize.

Typical cargoes affected by liquefaction include nickel ore, iron ore fines, bauxite fines, mineral concentrates and some by-products such as 'red mud', although this list is by no means exhaustive and many other solid bulk cargoes are susceptible to the risk of liquefaction.

International legal regime

The carriage of solid bulk carriages by sea is regulated by the International Maritime Solid Bulk Cargoes ("IMSBC") Code. The Code was first adopted by the International Maritime Organisation on 04 December 2008 and entered into force on 01 January 2011. It is of mandatory application under the Safety of Life at Sea ("SOLAS") Convention and is revised every two years. SOLAS was first adopted in 1914 after the sinking of the Titanic and by the 1960s it was recognised that the IMO should draw up and sponsor an internationally acceptable code of safe practice for the shipment of bulk cargoes. This led to the publication of the Code of Safe Practice for Solid Bulk Cargoes (the "BC Code") in 1965, which was subsequently replaced by the IMSBC Code.

The Code divides a number of solid bulk cargoes into three groups and, when it comes to liquefaction, cargoes fall into either Group A, which consists of cargo which may liquefy, or Group C, which should not. However, a cargo only falls within Group C where it comes within the description, physical properties and characteristics set out in the schedules to the Code. If not, it should be treated as a Group A cargo. Before 2020 for instance, bauxite consisting of a defined particle size was identified as a Group C cargo; bauxite falling outside of those parameters could only safely be treated as cargo which had the potential to liquefy. In the 2020 Edition of the Code, a new schedule was added for bauxite fines (a Group A cargo) where the product contains fine particles such that the moisture in the cargo cannot drain freely.

All IG Clubs require mandatory notification of any intention to load nickel ore from ports in Indonesia and the Philippines so that club managers can provide Members with relevant information to help manage the risks of carriage.

Liquefaction risk identified during loading

Proper compliance with the Code ought to mean that no solid bulk cargo is at risk of liquefaction during a voyage. However, cargo is often presented by the shippers as safe for shipment, but a risk of liquefaction is subsequently identified during the loading process, often after the crew carry out the complementary test procedure for determining the possibility of liquefaction laid down in the Code (known as a "can test") or due to the involvement of a cargo surveyor. Visual observations of cargo during loading, such seeing splatter on the sides of the hold, often give cause for concern.

Cargoes may have been wrongly presented as safe to load for various reasons, ranging from mistakes during the sampling and testing process to outright fraud by the shipper. Inevitably something has gone wrong on the shore side in such situations since, before presenting a cargo for loading, shippers are under a legal obligation under the Code to correctly identify the proper Bulk Cargo Shipping Name for any solid bulk cargo intended for shipment; determine the properties of that cargo in accordance with approved and suitable sampling and testing procedures; provide the master or his representative with appropriate information in writing sufficiently in advance of loading to enable precautions necessary for safe carriage of the cargo to be put into effect; and, provide a signed declaration in a prescribed form to the effect that the cargo has been fully and accurately described and that the test results are representative of the cargo to be loaded and correct. For a Group A cargo, the cargo declaration should be accompanied by a signed laboratory certificate stating the moisture content of the cargo and the Transportable Moisture Limit ("TML"). The TML is determined as a figure 10% in excess of the product's flow moisture point ("FMP"), FMP being the percentage amount of moisture in the product at which, under certain conditions, the cargo may begin to begin to behave like a liquid, or "flow". If the moisture content ("MC") of the cargo exceeds the TML then it is not safe or suitable for shipment. The "competent authorities" (port state of departure, port state of arrival and flag state) may authorise an exemption to the Code.

Where a liquefaction risk is only identified during the loading process, it will need to be determined whether loading can continue and whether it is safe for the vessel to sail. The

reliability of the information and cargo documents provided by shippers will need to be checked, often requiring visits to stockpiles ashore, further sampling and testing. This will lead to delays and increased costs, which one party to the adventure will ultimately have to pay for. In too many cases, the cargo information and documents were obviously unreliable, for example, if the testing was carried out more than six months prior to the date of loading. Whilst the lack of diligence on the part of the ship in such situations is less than ideal, it is ultimately the responsibility of the shipper to provide a cargo suitable for shipment and any information necessary to ensure safe carriage.

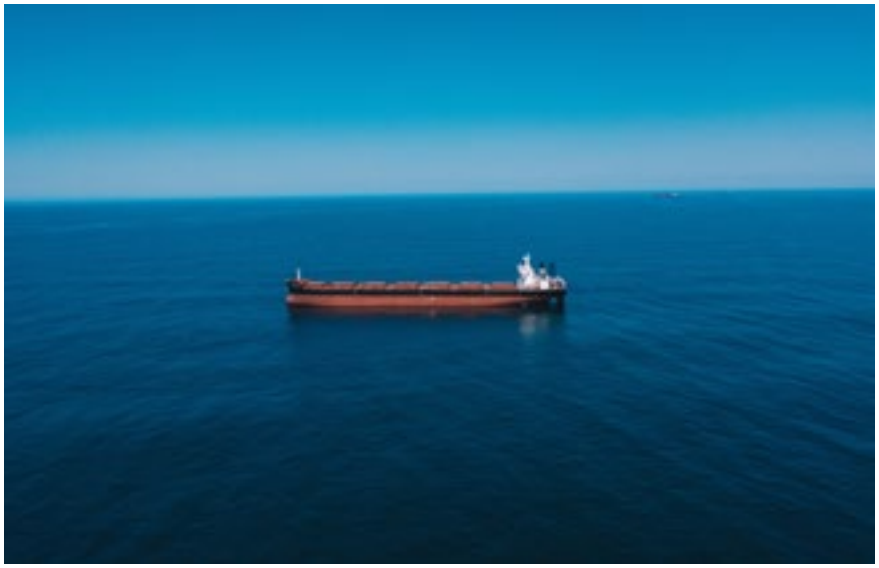
If a carrier is advised that cargo onboard is not safe for shipment, a choice will need to be made whether to have the dangerous cargo removed from the ship, or to try and remediate the situation. In many situations there is no way that cargo once onboard a ship can be physically removed or legally reimported to the country of origin. Remediation may involve waiting for the cargo to dry (sometimes aided by fans) or introducing safe cargo or a drying agent. Such steps need to be taken under the guidance of an appropriate cargo expert. The process can take months, often with no guarantee of success.

Depending on the terms of the contract of carriage or charterparty, the charterer and the shipper are likely to face a claim for the owner's losses arising from the dangerous nature of the cargo – discussed further below.

Cargo experts might disagree as to when suspect cargo has become safe to carry. In particular, some experts take the cautious view that the ship cannot sail until samples of the cargo have passed one of the tests described in the Code. Other experts may consider that the testing outlined in the Code is rudimentary and only intended to identify potential liquefaction risks prior to sailing and that, once a liquefaction risk has materialised, assessment outside the scope of the Code is permissible to determine whether cargo will in fact liquefy on the voyage. A stand-off between experts on the correct approach may be protracted and expensive for the party in the wrong.

Carriers have been known to continue with loading or to sail against the recommendation of cargo experts. The Club then finds itself in the role of a critical friend, understanding of the commercial need to trade without undue delay or additional cost but fairly warning of the potential implications if the ship is put to sea in a dangerous condition. If cargo is not safe to carry, this may prejudice Club cover and other forms of insurance, even where cover is not explicitly reserved. Operational costs arising from ensuring safe loading, even when incurred in anticipation of potential future P&I liabilities, are unlikely to be paid for by the Club.

North has also seen a rise in charterparty terms limiting the carrier's ability to comply with the Code by, for example, restricting access to stockpiles ashore. The existence and application of such terms are also likely to prejudice cover and are strongly discouraged.



Liquefaction risk identified during voyage

Liquefaction may only become apparent for the first time during a voyage and the ship may then have to call at a port of refuge. In some cases, however, the ship will have no better option than to continue to the intended destination.

Cargo experts will be able to advise on the level of risk in continuing the passage and on the steps which can be taken to minimise the danger. In such situations, the additional expenses incurred by the carrier in dealing with the emergency situation will in principle be recoverable in General Average. H&M will pay the ship's share of GA (with discretionary P&I cover for any shortfall due to under-insurance) subject to the terms of the hull policy. Collection from other interests will depend on the existence of actionable fault on the part of the carrier leading to the incident. If there is an actionable fault defence then, in principle, the unrecoverable GA will be reimbursed by P&I unless the owner knowingly failed to follow the Code or take other prudent precautions to avoid the risk of liquefaction.

Liquefaction causing the loss of a ship

The loss of a ship with the death of her crew following liquefaction will lead to various costs falling to P&I and other marine insurances. The loss of the ship itself will fall to H&M. P&I covers claims arising from the loss of cargo; injury or death claims relating to those onboard; wreck removal; and, pollution. Owners may pay for extensive search and rescue costs – either using their own assets or paying for state or private S&R efforts – which would not automatically fall to insurers.

Where P&I cover has been prejudiced because the Member failed to follow the Code or in some other way acted imprudently, the Club will not reimburse Members for losses resulting from cargo claims and people claims. In any event, cargo claims are usually not a major cost arising from a total loss caused by liquefaction. Typically, those cargoes prone to liquefaction are not very valuable. The claim is also likely to fail where the cargo itself was the cause of the loss **[3]**. Cargo interests

often only recover where loss results from liquefaction by putting undue pressure on carriers to pay an unmeritorious claim.

In the first instance P&I insurers may have to meet certified liabilities in respect of wreck removal operations or pollution costs up to the applicable limits of liability set out in the various international conventions. They will also look to support the dependants of those lost in maritime incidents even in the absence of a direct liability. Clubs will in principle be able to recover such exposures from Members if cover has been compromised.

Owners and their insurers will look to pursue recourse claims against charterers and cargo interests. Typically those claims arise on the basis of the common law obligation not to ship dangerous cargo, under specific charterparty clauses **[4]** or other express terms in the bill of lading or charterparty. Charterers and cargo interests will often seek to defend such claims either by relying on the burden of proof, by invoking technical construction arguments or by seeking to break the chain of causation.

To discharge its burden of proof, the owner will need to collect evidence showing the cargo liquefied on the voyage. Whilst this can appear daunting at first, it is rarely an insurmountable challenge. Evidence about the true nature of the cargo can usually be obtained following robust investigations. The requirement to show that the preponderance of evidence points towards liquefaction is not onerous. It will be a brave defendant who relies solely on the burden of proof to resist a claim and who therefore declines to put forward any plausible alternative theories to explain the loss of the vessel. Any competing theories can be tested by the judge or by arbitrators according to the evidence; non-liquefaction theories are frequently implausible.

Shipper and cargo interests may raise technical defences to the effect that there was no breach of the Code or of an express warranty, but these arguments usually fail to overcome the well-established common law obligation not to ship dangerous cargo without the informed consent of the carrier or the shipper's explicit responsibility under the Hague-Visby Rules for all damages and expenses resulting from the shipment of dangerous goods which the carrier has not consented to carry with knowledge of their true nature **[5]**.

Shippers and cargo interests may seek to allege that the ship was unseaworthy, breaking the chain of causation between the charterer/shipper's breach in shipping dangerous cargo and the loss. The unseaworthiness complained of often involving an alleged failure of those onboard to detect the liquefaction risk and to prevent carriage. This is presentationally a challenging argument to run. Whilst is it permissible to run alternative legal arguments in English arbitration or court proceedings, a party who produces extensive expert evidence to the effect that the cargo was safe for shipment will then struggle to turn around and argue the reverse that, if that cargo was in fact dangerous, then this should have been obvious to the crew at the time of shipment. It is also a distasteful argument if the crew were killed and are not able to defend their actions. It is legally a difficult argument: whilst the English courts have decided previously **[6]** that the chain of causation between a claim under Article IV, rule 6 of the Hague-Visby Rules **[7]** or for breach of the common law obligation not to ship dangerous cargo will be broken by a concurrent breach of Article III, rule 1 **[8]**, this argument is more likely to succeed where the owners' breach was a direct cause of the loss of the ship, rather than being a failure to sound the alarm bell that cargo may have been mis-declared, and the defence might not apply to a breach of an express term of the bill of lading or charter in any event. It is unlikely that faults on the part of the vessel falling short of actionable unseaworthiness could ever amount to a defence to a claim **[9]**.

Certain liabilities falling to a charterer as a result of a total loss caused by liquefaction may in principle be covered by charterers P&I cover or by Damage to Hull insurance. There may be gaps in these covers however, such as for charterer's own loss of earnings, which will be for the charterer's account unless specialist insurance has been obtained. Cargo interests may have insurance for the same liabilities under a 'cargo owners legal liability insurance' policy or similar.

The future

Whilst the Code benefits from continual evolution so it can meet new issues, properly followed it sets out a workable regime for ensuring the safe ocean transport of solid bulk cargoes in the majority of cases. The real challenges in the carriage of cargoes prone to liquefaction are practical, including lack of testing facilities; stockpile access; cargo surveyor availability; intimidation of seafarers and surveyors; fraud; and, a lack of understanding of the dangers inherent in carriage of solid bulk cargo by stakeholders. Charterers and cargo interests ought to appreciate that the costs arising from a serious incident involving liquefaction are likely to fall on them with only a modest discount to reflect the litigation risk in pursuing a recourse action.

[1] The Agios Nicolas [1968] 2 Lloyd's Rep. 57

[2] It is debateable whether dynamic separation and liquefaction are distinct but this article will treat dynamic separation as a type of liquefaction.

[3] The claim failing due to a lack of breach of duty by the carrier. Alternatively, to avoid circuity of action where the cargo claimant owned the cargo which liquefied or on the basis that one cannot take advantage of one's own wrongful conduct. Article IV, rule 2(m) of the Hague-Visby Rules provides a defence to claims arising from inherent vice of cargo, Article IV, rule 2(q) states a carrier is not liable in the absence of fault or neglect on the part of its agents and Article IV, rule 5(h) provides the carrier is not responsible for loss or damage where goods have been knowingly mis-stated by the shipper in the bill of lading.

[4] BIMCO's "Solid Bulk Cargoes that Can Liquefy Clause for Charter Parties" as set out in North's Recommended Clauses (2021-2022)

[5] Article IV, rule 6

[6] The Fiona, The Kapitan Sakharov, The Aconcagua

[7] The obligation on a shipper not to load dangerous cargo without the carrier's informed consent

[8] The obligation on a carrier and its delegates to exercise due diligence ensure a vessel is seaworthy prior to the commencement of a voyage

[9] Borealis v. Geogas which determined that the not actionable conduct of a claimant's agents only breaks the chain of causation where that conduct obliterates the wrongdoing of the defendant

Advancing sailing technology with safety in mind

*By **Christoph Wähling**, Principal Engineer, Hull Structure & Outfitting, DNV*

The evolution of sailing technology has heightened the focus on safety on board sailing yachts as designs and rigs become more daring and new speed records are set all the time. DNV continues to expand its rig certification services to help owners optimize performance without sacrificing safety.

Superyachts have undergone a tremendous development in recent years. "Until about 15 years ago, sailing yachts were rarely more than 30 metres long. Today, with superyachts of up to 100 metres and longer, we are dealing with an entirely different set of dimensions and physical forces. Masts are simply a lot higher," says Christoph Wähling, Principal Engineer at DNV. He has raced in offshore and inshore competitions in a myriad of yachting classes from the Farr 40 up to Maxi classes and witnessed the development of sailing yacht technology leading to ever higher speeds and physical stresses for yachts and their rigging. Today his professional focus is on superyacht rig certification.

Longer, faster ships and taller masts

"Growing superyacht sizes have major implications for safety," explains the expert. "Yachts from 24 metres and up – with the majority of today's vessels in the 40- to 50-metre range – are mostly some kind of commercial vessel: They have permanent crews and are chartered to third parties. This means that they are subject to flag state safety rules and classification requirements. Flag states have an interest in a clean safety record of their fleets and require sailing yacht rigs to be approved and certified by an independent body."

The design of 218ft ketch Hetairos, delivered by Baltic Yachts in 2011 and featuring a super-lightweight carbon composite hull and superstructure, is reminiscent of late 19th century America's Cup boats.

Wide range of services for specific operating conditions

DNV's sailing rig services cover flag state requirements, like the Red Ensign Group Yacht Code's 'Superyacht Rig Certification', with its Part A – Large Yacht Code and Part B – Passenger Yacht Code. Only the latter requires the spars to be certified, but both require rigging certification and personnel protection.

"DNV's expertise in this field is well known and often expressly requested," says Wähling. "We do much more than just putting a stamp on the rig design. We provide technical information, perform independent calculations and discuss the results with the client," he stresses. "Our clients appreciate this very much because a rig is a much more complex engineered system than many people think. We have found that most of our clients want more than a stamp for their rig." DNV will perform an objective, independent examination, assess compliance with the applicable standard and issue the certificate if everything looks good.

Assessment helps to get a realistic picture of the rig's performance conditions

The question is how the analyses are performed, says Wähling. "We offer our clients a cooperative experience where we ask them about the anticipated operating conditions for their ship, then carry out our calculations based on our formulas and discuss the implications with the client in an iterative process. These conversations sometimes uncover weak spots in the rig manufacturer's design that need to be addressed. While the client has no influence on our assessments, the client's input helps us make sure we get the full picture. We not only give the client a well-founded second opinion but also a different perspective that is based on our expertise. That is our unique selling proposition: We go beyond the stamp!" This coordinated approach ensures that the rig certification or classification will be based on realistic assumptions, Wähling adds.

Arctic sailing poses special challenges to rigs

More and more superyacht owners are showing an interest in exploring remote sea regions. At the same time, they have rediscovered the eco-friendly aspects of sailing and are increasingly viewing pleasure yachting as an opportunity to combine luxury with an expressly and visibly eco-friendly mindset.

When planning trips to remote areas – for example, sailing through the North-West Passage – extra precautions must be taken to ensure material and functional integrity, says Wähling: "Arctic sailing is a huge challenge for a yacht and its rigging." He mentions the 56-metre ketch 'Rosehearty' which underwent DNV Arctic Sailing certification before venturing to the extreme north.

DNV supports the design of efficient and safe rigs

"Our sailing rig service portfolio covers a comprehensive range of analyses and checks. We assess relevant load case scenarios and global stiffness, perform strain analyses and physical surveillance, review structural plans and attend sea trials for functionality checks, just to name some key aspects," Wähling notes. "Furthermore, with masts getting taller and taller, the risk of lightning strike increases, presenting yet another issue we have to look into."

Superyacht designers, owners, managers and captains turn to DNV's long legacy of sailing expertise for advice, both when creating efficient, safe rigs and for ongoing safe operations and smart servicing. The reference list is extensive, including such iconic projects as the near-zero-emission 106.7-metre superyacht 'Black Pearl' with three 70-metre DynaRig masts; the wooden masts of the racing schooner 'Germania Nova', a replica of a 1908 yacht; wind-assisted propulsion systems for Greenpeace; the world's largest high-performance ketch, the 86-metre 'Aquijo'; the 67-metre megayacht 'Hetairos', the largest two-mast carbon fibre racing yacht, and many more.

Black Pearl was launched in 2016. Her three-carbon fibre DynaRig rotating masts support a 2,900 m2 sail area. The ship is equipped with advanced energy-saving technologies, such as heat capture, an electricity-generating variable pitch propeller and batteries.

On-board personnel needs training under the Yacht Code

Even on a superyacht with space for no more than twelve passengers, the number of beds may be close to 100, Wähling points out. "These ships are chartered along with the crew and service personnel, from a helicopter pilot and physical therapist to kitchen staff."

To do rig maintenance, qualified crew members have to be lifted up into the rigging using special hoisting equipment which itself is subject to regulations. "There are new areas of interest in rig safety – or more importantly, flag state-required 'Protection of Personnel' requirements," Wähling explains. "They include crow's nest approval, safety when working on bowsprits and regulations for working aloft, including at boom height. The safety of superyacht sailing rigs and of personnel working in the periphery of rigs will always remain a priority for us at DNV and for our clients. We take pride in pursuing this goal without compromising creativity and innovation."

An evolving landscape for rig certification and classification

In the context of wind-assisted propulsion systems (WAPS), sailing technology is evolving and moving out of the superyacht and racing niches into commercial shipping. This means that definitions are changing – for example, what differentiates a yacht from a passenger vessel or commercial cargo ship, or what constitutes a vessel's main propulsion system. Flag states are watching these developments closely, responding with appropriate requirements to keep sailing safe and build risk awareness. As a certification and classification body, DNV will always follow suit and offer custom-tailored services, Wähling stresses.

"Today's sailing vessels are safer than those of the past but also much more powerful and incorporate complex technology and materials – with the potential for catastrophic failure. This is where we step in and identify potential vulnerabilities or hidden risks. It is our job to minimize these risks, and we intend to keep providing our expert services and be involved in the development of sailing rigs and WAPS when greenhouse gas emissions have stopped being an issue," Wähling emphasizes. "Whether for superyachts or commercial vessels or whatever hybrid convergence may evolve in between."

Antifouling innovations: a plan for ecological boating

By Alex Smith

This article first published in Marine Industry News Spring 2022.

The antifoul game is changing – from biocide-free solutions to UV panels and robotics – new antifouling innovations are placing a renewed focus on an economical and ecological boating future.

Marine coatings, particularly those used below the waterline, have an extremely important job to do. With around 4,000 potential fouling organisms in the world's oceans, from algae and anemones to barnacles and mussels, effective antifoul practices are vital. Antifouling does not just maintain hull efficiency and minimise costs but can also help prevent the spread of non-native species to other regions.

Given that a heavily fouled hull can increase drag by around 40 per cent, the environmental impact in terms of emissions is also critical. According to Chris Birkert, marine segment manager at AkzoNobel, a heavily fouled container ship could potentially "increase its CO2 emissions in a single year by up to 16,000 tonnes for a 10 per cent speed reduction and up to 64,000 tonnes if you want to retain its original speed".

Effective coatings and antifoul innovations are vital to sustainable boating, both from a financial and an ecological perspective. And while, in the past, the relative absence of legislation regarding toxic content in antifoul has made that job easier, the game has changed. With public attitudes, political intent and international legislation now broadly aligned in their commitment to cleaner seas, both commercial shipping and recreational boating are searching for biocide-free solutions that are as 'friendly' as they are effective.

STAY SLIPPY

Silicone-based foul-release coatings have been garnering plenty of attention and with good reason.

Rather than releasing harmful biocides into the environment, silicone-based coatings are designed to create a slippery surface, thereby preventing the attachment of organisms and helping hulls self- clean underway. With around two decades of effective use behind them, Propspeed's biocide-free, silicone- based coatings are now available for transducers, as well as props, running gear and subsurface metals. Hempel's Silic One is another biocide-free fouling release system, which is based on a combination of silicone and hydrogel. While longevity is not generally as strong as other techniques, most mainstream silicone foul-release coatings exhibit an effective service life of between 12 and 24 months.

METAL FRAME

Coppercoat uses a combination of a solvent-free water based epoxy resin and high purity (99 per cent) copper. Each litre of resin is impregnated with two kilos of ultra fine copper – the maximum allowed by law. On immersion, sea water attacks the exposed pure copper powder, causing the formation of cuprous oxide. This antifouling agent deters growth until the surface degrades further to become cupric hydrochloride. This final copper form is highly unstable, and is washed away by the movement of the yacht, thereby removing any accumulating silt or slime underway.

LET THERE BE LIGHT

Ultraviolet (UVC) light is a promising technology in the field, particularly in the form of flexible light-emitting panels. AkzoNobel has been involved with Philips in the development of its RunWell panels. Testing on commercial vessels has shown that UV light emitted from a hull's surface can present an effective deterrent to biofouling in a range of locations, in a range of conditions, whether a hull is in motion or not.

Birkert explains: "What we're looking at is embedding UVC LEDs into a highly mobile, highly fluid material that you can stick onto pretty much any shape. Power requirements are very minimal, and these things could potentially last ten years without replacement." With trials expected in the leisure industry within the next five years, it's hoped that UV light could play a major part in the removal of biocides from the antifoul equation.

SECOND SKIN

Biomimetic technologies attempt to make a boat hull 'invisible' to fouling organisms by mimicking a variety of natural foul-resistant surfaces, whether that involves coral tentacles or the skin of a whale or dolphin.
Shark skin, with its overlapping plates and parallel ridges, has garnered particular attention – and as 3D printing and laminate technologies continue to develop, new materials and application techniques are likely to make biomimetic solutions a possibility.

SOUND TRAVELS

Ultrasonic antifouling systems use transducers to emit simultaneous bursts of ultrasonic sound waves in multiple frequencies. The theory is that the alternating positive and negative pressures create microscopic bubbles that implode against the surface, destroying the very microorganisms that form the building blocks for bio fouling.
Though concerns over the long- term impact of ultrasound on key mammalian species including whales and dolphins have been raised, studies have drawn no conclusive evidence to support those concerns and ultrasonic systems remain in use both on steel-built commercial vessels and as standalone and supplementary systems on recreational craft.

A NEW AGE OF INTEGRATION

Gone are the days when paint manufacturers confined themselves solely to coatings. A more dynamic 360 approach is also coming into play. According to Stein Kjølberg, global category director, hull performance, at Jotun Performance Coatings, the change in how users are approaching their fouling problem in itself is a critical innovation.

"In the commercial world, the onset of fouling is always discovered too late, leading to inflated fuel costs for an average of six months before remedial action is taken. So it makes sense that effective antifouling systems need to involve a combination of the products we supply, the advice we give and the cleaning techniques we use," Kjølberg says.
Jotun's industry-first 'hull skating' antifoul robot could bring extra flexibility to fouling response protocols. Its integrated Hull Keeper system takes full advantage of the improvements in 'big data' to go even deeper. According to Jotun, it assesses the data in relation to a vessel's type, route and activities, enabling ship owners to take early action against fouling and to remain properly informed about where to clean and where to sit idle, so they can minimise the severity of the fouling challenge.

This data-driven approach is strongly endorsed by other industry players too – not least, AkzoNobel, which states that its integrated Intertrac Hullcare system can achieve "step-change reductions in CO2 emissions of up to 34,000 tonnes and fuel savings of €4.6million" for a ship owner over a ten-year period.

ROBOTIC RANGE

The advent of the integrated service package looks likely to make a major impact on the leisure market as well. After all, if an owner wants a clean, fast and efficient hull for five years, then rather than buying a standalone antifoul coating, it makes sense to invest in a subscription-based service that spreads the cost and improves consistency.

According to Phil Horton, environment and sustainability manager at the RYA, such a service already exists in the Baltic states, where boats with silicone coatings are able to clean their hulls in marinas simply by driving through robotic car wash-style in- water jet systems.

Horton notes the sheer scale of the business opportunities available to paint manufacturers who are willing to cooperate more closely with marina operators and cleaning companies.

"With sustainability now providing such a strong driving force, innovation is really starting to happen, not just in relation to the antifoul coatings themselves but also in relation to the way people think about maintaining their hulls.

"There are still strides to be made in terms of independent testing so that businesses and consumers are able to assess how well each new technology works but with everyone now moving in the same direction, I have no doubt that we are on the cusp of a more elegant, more engineered, more carefully considered approach that takes proper account of environmental concerns as well as performance," says Horton.

Biofouling management: the benefits of a clean hull

Australia joins New Zealand and California and requires international vessels to provide information on how biofouling has been proactively managed prior to arriving in its territorial seas. The aim of Australia's new regulation is to protect marine biodiversity, but maintaining clean vessel hulls will also reduce fuel consumption and help operators to reach their emission reduction targets.

The Australian Government's Department of Agriculture, Water and the Environment (DAWE) has announced that, beginning 15 June 2022, international vessels trading to Australia will be required to provide information on how biofouling has been managed prior to arriving in Australian territorial seas. This information shall be reported through the Australian Maritime Arrivals Reporting System (MARS).

According to DAWE, the information will be used to target vessel interventions and vessel operators will receive less intervention for biofouling if they comply with one of the following three accepted biofouling management practices:

- Implementation of an effective biofouling management plan; or
- Cleaned all biofouling within 30 days prior to arriving in Australia; or
- Implementation of an alternative biofouling management method pre-approved by the Australian authorities.

DAWE has further announced that it will be taking an educational initial approach to enforcing the new requirements between 15 June 2022 and 15 December 2023. During this period, focus will be on providing education and advice to ship operators with the aim of minimizing unintentionally incorrect pre-arrival reporting and improve the effectiveness of biofouling management plans. However, powers under the Australian Biosecurity Act 2015 will continue to be used to manage unacceptable biosecurity risks associated with biofouling.

The Australian regulations and associated guidance documents can be downloaded from the DAWE website: Managing biofouling in Australia. In addition, an import industry advice notice was issued on 17 May 2022.

The biodiversity threat

The introduction of invasive aquatic species (IAS) associated with global shipping has been identified as a significant threat to the world's oceans and coastal ecosystems. A multitude of species, carried either in vessels' ballast water or on vessels' hulls, are capable of surviving transit to new environments where they may become invasive by multiplying and out-competing native species. Not all species transported by vessels will become invasive, and not all survive the journey. However, it is difficult to predict which species may arrive and where and when an introduced species will start to spread by itself into new areas and damage the local ecosystem. Even species that originally do not seem harmful may become invasive if environmental conditions such as temperature and nutrients change. Management practices that prevent the introduction of IAS are therefore a far more efficient and cost-effective approach to the problem than clean-ups once an invasive species has established in a new area.

While the risk posed by IAS in vessels' ballast water is now regulated internationally under the IMO Ballast Water Management Convention, the control of vessel biofouling remains largely voluntary. As a result, individual governments develop their own strategies and policies to reduce the introduction of foreign species from bio fouling of vessels' hull. The most comprehensive biofouling management policies to date are those of New Zealand and the US State of California – and now they will be joined by Australia.

An underestimated cost for vessel operators and the environment?

Biofouling growth on vessels' hulls is not only a threat to marine biodiversity but also a long-standing operational problem for the maritime industry. Its impact on vessel speed and propulsion, and ultimately fuel consumption and atmospheric emissions, is well documented. A recent report by the GloFouling Partnership Project even concludes that the perceived impact of ships' biofouling on greenhouse gas (GHG) emissions is likely to have been historically underestimated by the shipping community. For example: A layer of slime as thin as 0.5 mm and covering up to 50% of a hull surface can trigger an increase of GHG emissions in the range of 20 to 25%, depending on ship characteristics, speed, and other prevailing conditions.

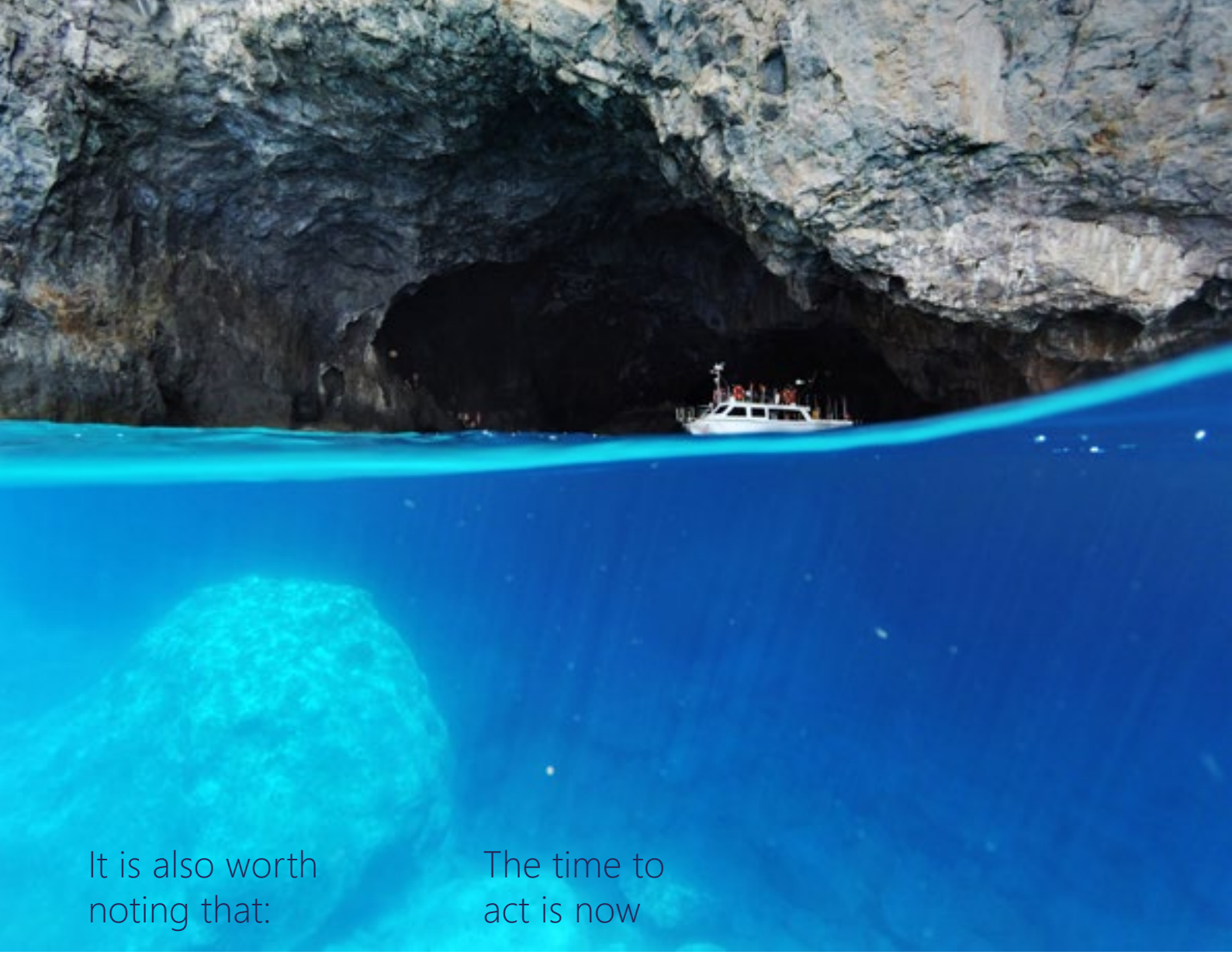
For more severe biofouling conditions, such as a light layer of small calcareous growth (barnacles or tubeworms), an average length container ship can see an increase in GHG emissions of up to 55%, dependent on ship characteristics and speed.

Besides increased fuel costs and potential cost-intensive hull cleaning required by port authorities, there are also other biofouling-related economic implications for vessel operators. Extensive vessel biofouling can increase engine wear and affect intakes and internal seawater systems, requiring earlier and more frequent maintenance and asset management costs than would otherwise be needed. Some even argue that reduced vessel speed and longer voyages mean increasing crew costs relative to the distance of travel routes.

Regulations, standards and practices

According to a report published by the IMO in January 2022 (PPR 9/INF.24), inconsistency in biofouling and in-water cleaning policies creates a major challenge for the shipping industry. While the report identifies several regional, national and sub-national biofouling policies and practices already in place, it also concludes that comprehensive biofouling management policies are not widespread and those that do implement comprehensive policies, such as New Zealand and California, are not consistent.

Of the many guidelines and industry standards relevant to biofouling management, the most wide-ranging are the IMO Biofouling Guidelines. These non-mandatory guidelines aim to provide a globally consistent approach to the management of biofouling and include best practice recommendations for minimising biofouling. A key component of the guidelines is the preparation of ship-specific biofouling management plans (BFMP) and biofouling record books (BFRB). There are also specific recommendations for what to include in a BFMP and BFRB, and a template for each. This documentation is also the cornerstone of many current and proposed national and sub-national biofouling management policies and practices, such as those of New Zealand, California, and more recently, Australia. Provision of this documentation is also expected to be a key requirement under US federal law once the new vessel discharge standards, proposed under its Vessel Incidental Discharge Act (VIDA), have been finalized and standards for implementation agreed.



It is also worth noting that:

- The IMO Biofouling Guidelines are currently being reviewed by IMO Member States and a new version is expected to be approved in 2023. The aim is to make the guidelines clearer by being more specific on the recommended biofouling measures, how to implement the measures, as well as on the procedures for inspection and cleaning. The next version of the IMO Biofouling guidelines will remain non-mandatory and will hence not provide specific international rules or standards for the regulation of biofouling management.

- Although there is an obvious relationship between the mandatory IMO Convention on the Control of Harmful Anti-fouling Systems (AFS) on Ships and biofouling management, implementation of the Convention does not equate to having a biofouling management policy. The AFS Convention provides a framework to limit the impact of harmful AFS but does not regulate or set performance standards for the AFS.

The time to act is now

Finding the 'right way' to handle biofouling can present some challenges as the biofouling risk and management options will be different for each vessel depending on design, operating profile, and trading routes. However, with new biofouling regulations entering into force, and the IMO GHG reduction targets looming on the horizon, we encourage vessel operators to revisit and, if necessary, update their biofouling management procedures. Steps should be taken to ensure regulatory compliance with mandatory biosecurity requirements where in force. An additional benefit is that it will optimize operations in terms of fuel consumption, maintenance frequencies, and emissions into the atmosphere.

Although not all regional biofouling regulations are the same, compliance with the IMO Biofouling Guidelines will go a long way towards allowing access to ports with mandatory biofouling requirements. The establishment of ship specific biofouling management strategies and procedures in the form of BFMPs is key, as is proper onboard record keeping. An up-to-date BFRB will assist port officials to assess a vessel's potential quickly and efficiently for biofouling risk and thus minimize any delays to its operation.

As individual ports may impose restrictions on in-water cleaning, depending on the methods and chemicals involved, we recommend that operators verify the applicable requirements with the vessel's local agent well before arrival at the planned location for cleaning. Advice should also be taken from the industry standard on in-water cleaning of ships published by BIMCO and the International Chamber of Shipping (ICS).

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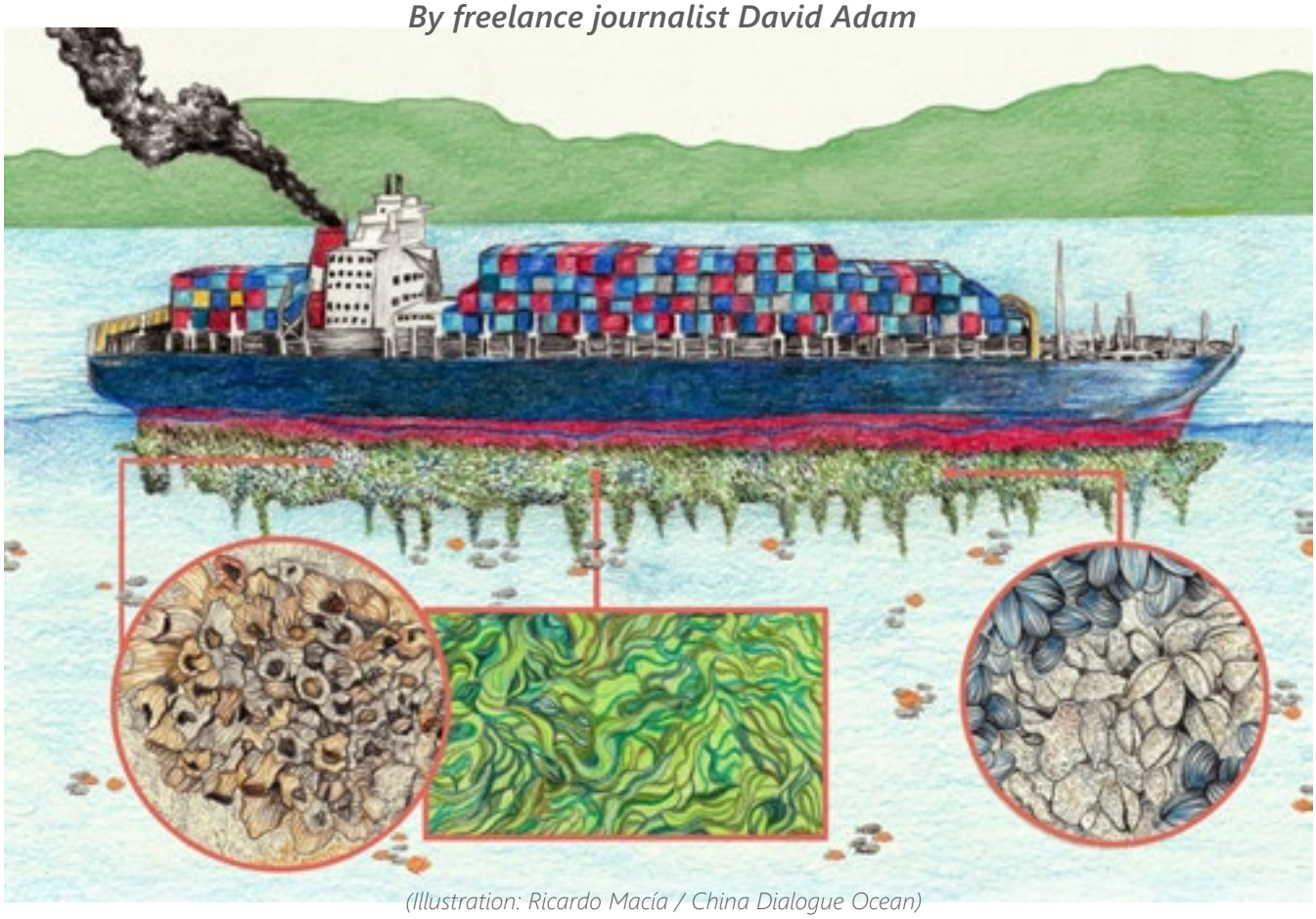
BLISTERING BARNACLES!

The sticky problem of biofouling

The accumulation of sea life on ships' hulls, known as biofouling, slows ships and can spread invasive species. Could regulation and innovation have the answers?

By freelance journalist David Adam



(Illustration: Ricardo Macía / China Dialogue Ocean)

Like many English words and phrases, the description of something reliable as "copper-bottomed" has a maritime origin. It dates from the 18th century, when seafarers had long struggled with unwanted plants and animals that stuck to the wooden hulls of their ships and slowed them down.

In 1761, the Royal Navy plated the hull of its frigate HMS Alarm in thin copper, which kept away weeds and tube worms so successfully that the practice – and the praise of something risk-free as copper-bottomed – became widespread. At least it did until the launch of iron ships a century later, which unfortunately could not be copper-plated because that encouraged corrosion.

Today's sailors still struggle with the same problem. More formally called biofouling, the unwanted build-up of sea life on the hulls of everything from pleasure boats to aircraft carriers causes drag through the water. This slows speeds and so necessitates the burning of more fuel, producing both higher costs and more carbon emissions. (The skins of sea creatures from whales to sea snakes can also become encrusted with barnacles in a similar way.)

Biofouling can have a more direct environmental impact as well. As ships criss-cross the oceans, their submarine stowaways can pose real problems to ecosystems that must suddenly learn to live with the new arrivals.

"Pretty much any surface that you put into the ocean is going to get growth on it. It's going to accumulate biofouling," says Kelli Hunsucker, an oceanographer at the Florida Institute of Technology. "It's when that growth becomes too cumbersome that we see these problems. And they are the same problems that the Greeks and the Romans had. They all had issues with biofouling."

Barnacles and other stowaways

Studies have recorded some 2,000 different species living in these shipbound communities, the barnacle family probably being the best known. Related to crabs and lobsters, these adhesive crustaceans have become shorthand for a sticky nagging problem that's hard to remove.

Barnacles start life much more mobile, released in their tens of thousands as tiny larvae. Although they can survive for several weeks floating in the sea, to develop into adults they must fix onto a hard surface, which they do with relish. They are such a common feature of life at sea that they were once used in a punishment called keelhauling, in which an unfortunate seaman would be dragged along the underside of the ship's keel by a rope, and so across fields of razor-sharp shells. The longer the biofouled ship had gone without being beached and cleaned, the worse the experience.

Still, the high-profile barnacle is just the most visible form of biofouling, and one that tends to appear relatively late in the process. Microscopic bacteria and algae get there earlier, feeding on the cocktail of chemicals that seawater contains.

"As soon as you put a surface in the water, organic molecules will start to adhere to it. Then within minutes or hours you get bacteria forming," Hunsucker says. "And then it goes from there to different types of unicellular organisms, algae and quickly up to larger life like barnacles and oysters. It forms this beautiful three-dimensional community with even crabs and shrimps living in there."

Beautiful to a marine scientist, perhaps, but not to a ship's captain. A microbial biofilm just a few millimetres thick is enough to significantly increase drag, Hunsucker says. One study suggested that a ship with a medium level of barnacle encrustation would need 36% more power to sustain its speed than a clean one. Dry dock inspections of some 249 ships between 2015 and 2019 found that over 40% had barnacle coverage of 10% or more. "I think this is going to become a bigger issue for the shipping companies and the cruise lines who are going to be really hit by the drastic increase in the cost of fuel," Hunsucker says. "You don't have to reduce your biofouling by much, but if you can reduce it then you can save a lot of money on gas."

How to do that is the "million-dollar question" Hunsucker adds. And it's a question a lot of people have tried to answer. Many still rely on the old method of hauling ships out of the water and scraping the shells and slime away. That's effective, but not very efficient. A better strategy is to stop the biofouling forming in the first place. And to do that, besides the Royal Navy and its copper plates, shipowners have tried everything from special paints to ultrasonic waves.

In the 1960s and 1970s, such paints relied on a toxic chemical called tributyl, which is now banned because of its wider negative impact on marine life. Newer paints often rely on copper, which is also drawing criticism for possible environmental damage. Sweden has already introduced restrictions on the use of copper-based paints in some waters.

Yigit Demirel, a naval architect and marine engineer at Strathclyde University, says there could be a

more environmentally friendly route to stop biofouling. As the problem is worse where water moves slowly – giving organisms an easier time attaching – Demirel is looking into optimising ship design to speed up water flow across and around the hull, and especially those regions with sluggish flow, such as towards the stern.

"Maybe we can introduce some controlled roughness, or weird shapes, to increase the diversity of the flow. Or maybe we can dramatically change the ship shape and come up with some novel profiles," he says.

Low fuel costs have meant ship designers have not focused too closely on how to prevent biofouling, he says. The emphasis on climate change and controlling greenhouse gas emissions is changing that. So too is the understanding that biofouling ecosystems transported across the seas themselves pose a threat.

In June this year, Australia will introduce new restrictions on biofouling to prevent the entry of invasive species. These can include the need to thoroughly clean the hull of a ship in the month prior to arrival. New Zealand already operates similar rules, and other places are considering them.

It's only a matter of time before wider international rules are in place to control hull biofouling, Demirel predicts. It's a logical next step, given the regulatory crackdown in recent years on the movement of invasive species through ballast water.

The problem within ballast water

Ballast is needed to stabilise ships, even very big ones, in rough weather. Depending on what cargo they carry, vessels typically pump millions of gallons of water into huge tanks before starting a voyage, and then discharge it when they reach their destination. As they pump in water, they also grab whatever sea life happens to be around. When they pump it out again, many of these creatures are still very much alive – and sometimes very unwelcome in the new surroundings.

"Ships have been transporting ballast water for hundreds of years and there are a few examples where it has had severe adverse effects" says Okko Outinen, a marine scientist at the Finnish Environmental Institute, with a special interest in ballast water.

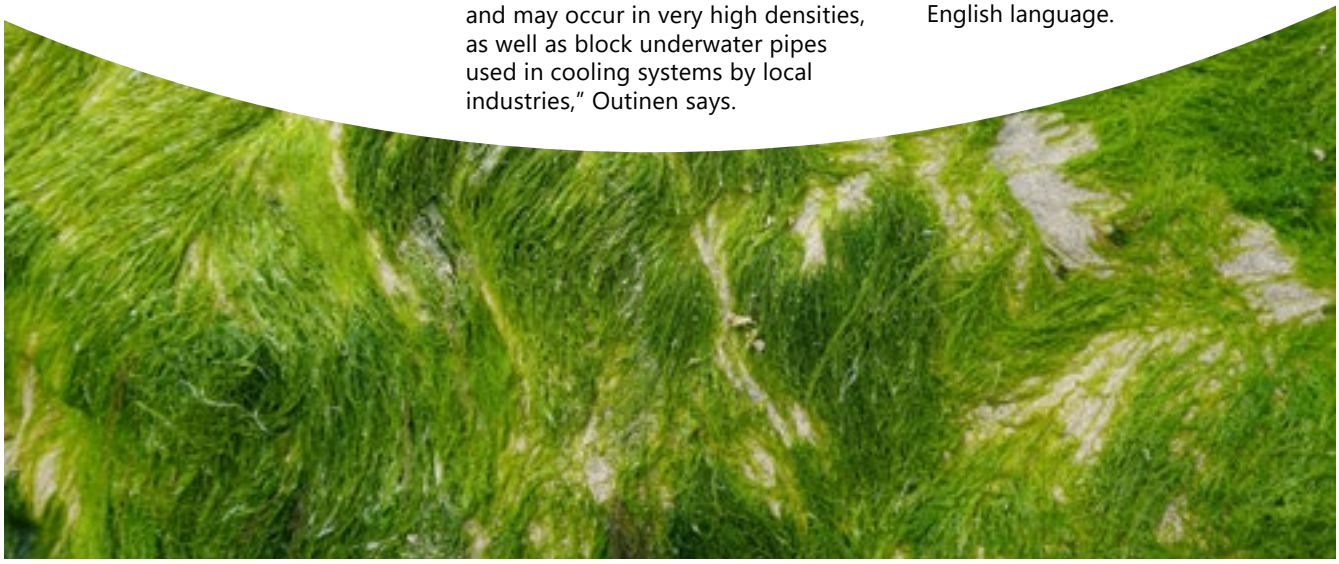
Among the worst incidents was the 1982 introduction of an American jellyfish called a sea walnut to a port in the Black Sea. The creatures flourished, depriving local species of zooplankton, and spreading all the way to the Caspian Sea. Local fisheries, which had been worth hundreds of millions of dollars each year, were wrecked.

In the other direction, ships travelling west across the Atlantic managed to introduce zebra mussels from Europe to the Great Lakes of Canada and the US, where they have caused havoc. "They have very sharp shells that swimmers cut their feet on, and they are able to reproduce quickly and may occur in very high densities, as well as block underwater pipes used in cooling systems by local industries," Outinen says.

In response to the growing threat and costs of invasive species spread by biofouled ballast water, the International Maritime Organisation (IMO) drew up regulations in 2004. These came into force in 2017 and declare that "ships must manage their ballast water so that harmful aquatic organisms and pathogens are removed or rendered harmless before" it is released.

It's a big change for ship operators, Outinen points out. "So, at the moment we are in an implementation and experience-building stage, with the penalisation rules not being fully implemented or enforced yet," he says. "We're now figuring out everything related to how ballast water treatment systems work in different freshwater and marine waters. How do we monitor and sample ballast waters in a reliable, quick and cost-efficient manner? How do we detect how many organisms are viable or living? And many other similar practical details." Once these issues have been worked out, the rules are scheduled to be more rigorously enforced in 2024, he adds.

Some of the problems posed by biofouling and ballast water, such as the transfer of invasive species, are the same. So are some of the possible solutions. One is using ultraviolet light to kill unwanted sea life. In an echo of the Royal Navy's brainwave to install copper sheets back in 1761, some are experimenting with high-tech tiles that contain ultraviolet light bulbs, which can be fitted to a ship's hull. If it catches on, then who knows maybe "UV bottomed" will be the latest maritime phrase to enter the English language.



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If a boat makes a sound in the Arctic, will wildlife flee?

That's not a rhetorical question but one that Arctic tourism operator Hurtigruten Svalbard has to deal with on multiple levels. As the eldest tour operator on the cluster of islands that reside about halfway between the northwest coast of Norway and the North Pole, the organization understands the impact their boat tours have on the landscape, which see wildlife ranging from walruses to seals to numerous types of whales flee when hearing the roar of their engines from hundreds of feet away. That scattering of wildlife runs counter to the audience experience the organization seeks to provide, as well as to their commitment to sustainable tourism.

A desire to change how visitors can experience these natural wonders while also transforming values that are the foundation of their business led to the creation of the Kvitbjørn, a brand-new closed hybrid boat. Designed for exploration in the heart of the Arctic, the 14.6mX4.2m (48'x13.8'), 12-passenger Kvitbjørn (translation: Polar Bear) is powered by a complete helm-to-propeller Volvo Penta twin D4-320 DPI Aquamatic hybrid-electric solution. Integrated into a Marell M15, the Marell and Volvo Penta teams worked together to create a solution that would provide the ultimate sightseeing experience while also advancing sustainable solutions at sea.

The team at Volvo Penta invited members of the media out to Svalbard for the formal unveiling and first official voyage of the Kvitbjørn to determine whether or not they succeeded with both. Along the way, we were able to explore what such commitments and customizations can mean for others that are exploring their own hybrid opportunities and how new business models can change an entire way of doing business.

Oh, and we also found out that carrying a gun in Svalbard is not just recommended but mandatory due to the threat of polar bear attacks. Lessons on every level but none as relevant as the ones related to what this environment says about changes that are just around the corner for individuals and the maritime sector as a whole.

The world's northernmost town

To say that Svalbard is like another world doesn't convey the sense that the uninitiated get when flying over and then landing in a place that doesn't just look cold but is literally frozen in the warmest of times. This Norwegian archipelago is only about 800 miles from the North Pole, which means temperatures well below freezing are normal in the winter months while the average summer water temperature is around 0°C. The largest settlement is Longyearbyen that has a population of just over 2,000 people, enabling it to become known as the world's northernmost town.

That small number of human beings has allowed the native animal population to remain relatively stable, with signs warning of polar bears being an especially stark reminder that this world still belongs to those animals. They've become a popular spot for tourists to take photos, although posing with such signs is just one of the many activities available to them.

That's for good reason since the local economy is primarily geared towards tourism and scientific research. While year-round coal mining operations defined Longyearbyen in the early 20th century and continue to be the biggest industry on Svalbard, the last coal mine in operation is set to shut down in 2023. The future of the town is very much connected to the tourism industry but it's a tricky needle to thread. Too much growth can ruin the appeal of such locations not to mention the settings themselves. In a place that's as serene and untouched as Svalbard, finding that balance is essential.

Doing so is exactly what Hurtigruten Svalbard is prioritizing in the short and long-term. As a full-service provider of experiences that make Arctic dreams a reality, the organization offers everything from dog sledding to kayak paddling to ice caving to skiing expeditions. The Hurtigruten team knows better than anyone how such experiences can tax these same landscapes though, an understanding of which drove their commitment to sustainable tourism. This ethos is designed to take into account the effect that tourism has on the current and future economic, social and environmental impacts of visitors.

"Our ambition is to be the most sustainable travel operator in the world," said Henrik Lund, managing director of Hurtigruten Foundation. "That's not the cheapest way of doing business, but it is the best way. It would have been easier for us to buy a regular boat but it wouldn't have been the right thing to do. Our commitment to sustainability is engrained in everything we do which means it can't just stay in a slide deck."

Their commitment to sustainability partially drove initial conversations with the Volvo Penta team but considering the impact to the way they operate today was also a priority. Boat tour operators could see the sound of their engine caused the wildlife to scatter, preventing guides from being able to showcase the true wonders of Svalbard. The relative silence of the electric motor changes these experiences for the better, which was something that was front and center on the maiden voyage of the Kvitbjørn.

Connecting sustainability and innovation

Climbing aboard a ship that is moored next to others that looks as if they're completely iced over contributes to the otherworldly experience of Svalbard. Mountains that look like they're made of snow loom on every side, and the slightest breeze is something you end up feeling in your bones. My personal approach to fashion is to be able to wear the same thing inside as I do outside but that does not work on any level in Svalbard. And especially not when you're out on the Artic Ocean, with nothing but the water and weather.

That sense of calm and cold is the core experience of Svalbard though, which the Hurtigruten Svalbard understands. With a top speed of 30 knots, a cruising speed of 24 knots, the boat effortlessly moved out toward what looked like the endless mountains of the archipelago, all of which our guide was able to name. But the shift to silent cruising when we were able to get out on deck and see everything took it to another level.

Out in the middle of nowhere aboard the Kvitbjørn, you can literally hear the ice bob in the water. A walrus that was taking a break on the ice shore didn't dive into the water. Birds seeming to skim across the water were on every side. All of which provided a sense of not just seeing these settings but actually being part of them. That difference is something the Hurtigruten team understood and knew they could further cultivate.

"We almost did a deal with Marell for a regular drive train but then we met with the Volvo team to explore the option to have something more sustainable, but also something that made business sense," said Tore Hoem, adventures director at Hurtigruten Svalbard. "To us though, it was really about the guest experience. And the key is silence. The silence is the coolest thing about it."

That focus on audience experience is connected to what Hoem mentioned with the product making business sense. The deeper commitment to sustainability that the company prides itself on is evident in Svalbard, where you can see why this ecosystem is one that needs to be respected, cared for and preserved. At the same time, providing a better experience makes business sense because it means customers will keep coming back and recommending said trips to friends and colleagues.

Being able to cultivate these new experiences was a technology question that was addressed in those initial meetings between the Hurtigruten and Volvo Penta teams but the connection between technology and core business values runs deeper for both teams.

"We believe that sustainability and innovation are connected,"

said Johan Inden, president of the Volvo Penta marine business unit. "Innovation comes from being able to understand the use case and then being able to design for it. This boat was designed for the Arctic waters of Svalbard but how would this hybrid solution need to be different than just another drivetrain? Those weren't answers that we had when we began the initial conversations, but we're committed to testing and learning what can work anywhere and everywhere. If we're not trying, we're not going to get there."

Getting there is related to a bigger goal of the organization. Part of larger Volvo Group, Volvo Penta's vision is to become a world leader in sustainable power solutions, with a vision to be a net-zero emissions company by 2050. Their full-systems approach is not just about more sustainability but higher performance, which is the only way that vision for sustainability will become a reality. That means the technology has to not only create quantifiable efficiencies but be reliable in a very practical sense. The capability and reliability of this technology gets pushed to the limit in Svalbard.

"We're operating in such a harsh environment, where everything has to work." said Jonas Karnerfors, sales project manager at Volvo Penta from the deck of the Kvitbjørn. "We needed to think more carefully about the job to be done, which is why we knew we had to create something that would seamlessly shift between driving modes. That connects back to the experience though, because when the boat is operating silently it's operating in a much more sustainable manner. If it works here it can work everywhere."

Connecting innovation and sustainability isn't just about technology though, as this project also marked the debut of an e-mobility-as-a-service' model from Volvo Penta. Designed to soften what are otherwise very high upfront payments typically associated with electromobility solutions, the model will see Hurtigruten pay a monthly fee depending on how much they actually utilize the drivetrain, which is something the Volvo Penta team considered in great detail.

"The price of this technology is higher so we knew we needed to better understand the business model," Inden continued. "Is there a service model? Is there a rental model? We decided it's not just a technology platform. It gives us a shared risk and joint responsibility. We are responsible to upgrade or make changes so we more fully determine how this can be used on commercial size. So we're not only testing the technology with this but also testing brand new business models."

Although it's still at a concept stage, news about and developments related to this model could end up changing how these solutions are approached and adopted. If the cost isn't what's standing in the way of someone fully exploring the opportunities that are associated with hybrid-electric vessel technology, then what is? That's the question this model will put squarely in front of owners and operators who might not be operating in the Arctic but will need to determine if the capability and reliability that hybrid technology has demonstrated makes sense for them this year and beyond.

Taking the long view of such challenges is easier to do in a place like Svalbard, where the stakes associated with decisions being made today can literally be experienced. Avoiding chunks of ice in electric mode makes all the difference in the world but it's impossible to not think about the experiences that others can and will have in this same environment. Enabling those future experiences is something the Hurtigruten team is dedicated to, highlighting what it means to properly consider all the options that the technology represents.

A challenge to the maritime industry

The investment that Hurtigruten has made in hybrid technology is tied to the experiences they can now enable but also to ensure they aren't behind the curve. Their customers expect and often push for greener solutions which has compelled them to set a benchmark that could soon become a new industry standard. This sort of standard needs a collaboration between owners, users and stakeholders though and it isn't about a specific piece of technology or use case. New technology changes behavior, and while this solution is specific to short, dedicated journeys, there's a bigger push for it to be an enabler for many different types of commercial marine operations. What exactly that looks like will depends on how this technology can fit into a specific vessel or operation, which will require active collaboration that many are pushing to see.

"We want to challenge the industry with this solution," Inden said. "That challenge isn't about saying that hybrid solutions have to be adopted over the next two years or something prescriptive like that. Our challenge is about compelling vessel owners to really look at what they're doing and work to transform an entire industry into something more sustainable that also make business sense for them. With new payment models we believe we can support this transformation that directly connects to being a net-zero emissions company by 2050. That isn't our vision for the future, it's our plan."

Sitting less than 1,000 miles from the North Pole in a boat that is using electric power to maneuver through a field of ice, surrounded by wildlife that allows you to get right next to it, it's simple enough to understand the stakes of that transformation, both in the short term and long term.

Just as the sign about polar bears mentioned though, properly preparing for a transition is on individuals. It's the same whether you're transitioning from the relative safety of Longyearbyen to the surrounding wilderness or changing from the relative stability that powering systems have provided to the maritime industry to incorporate hybrid options. Heeding the warnings of literal or figurative signs that call out these transitions all comes down to the choices that people do or don't make with tools that are readily available to them.

Look out for fuel leaks and unshielded hot spots in engine rooms

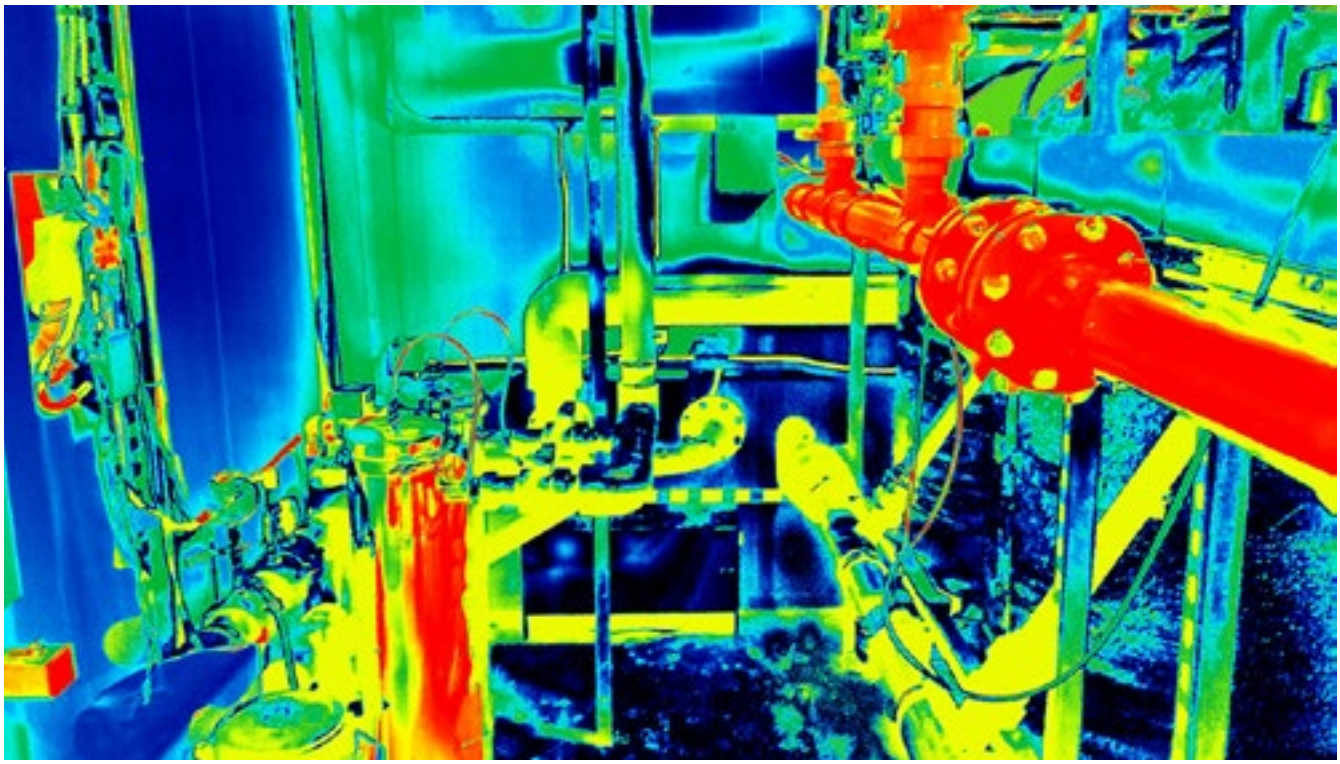


Photo credit: Gard Club

By Siddharth Mahajan, Svend Leo Larsen and Kim Watle.

In this article, Siddharth Mahajan, Senior Loss Prevention Executive, Singapore, Gard, Svend Leo Larsen, Senior Claims Adviser, Bergen, Gard, and Kim Watle, Senior Business Analyst, Oslo, Gard analyze the cause of fires in engine rooms.

The majority of fires onboard ships start in the engine room and the frequency of such fires is on the rise. Although the main cause of these fires may not be identical, there are certain similarities in the underlying patterns of the fires.

Introduction

Every year fires on board ships lead to loss of lives and severe damage to the ships themselves. Most fires on board ships originate in the engine room where the three ingredients for a fire, namely fuel, oxygen and a source of ignition, exist in abundance. These do not only start the fire but also feed and intensify it further. Fire safety is not only about detecting and fighting a fire, but also about preventing it from igniting in the first place.

In this article we will focus on how these fires can be prevented. We will touch upon some of the main causes of engine room fires and explore insights from our claims data to understand the frequency of such fires before setting out some recommendations on how to mitigate the risks of these fires occurring.

How do most engine room fires start?

A review of Gard's hull and machinery (H&M) claims for the years 2017-2021 related to fires and explosions on vessels, shows that nearly 60% of all such fires originated in the engine room. Nearly two thirds of these engine room fires occurred on the main and auxiliary engines or their associated components such as turbochargers. The majority of these incidents were caused by a failure in a flammable oil system, most often in the low-pressure fuel oil piping, allowing spray of oil onto an unprotected hot surface. Below is an example from our claims portfolio.

Case study

A copper pipe that was part of the fuel oil pressure gauge supply pipework for one of the auxiliary engines fractured. Due to a missing metal spray shield the fuel sprayed onto the unprotected hot surfaces of the nearby turbocharger and the exhaust system which had temperatures of more than 400 °C. The fuel ignited causing extensive damage to auxiliary engines and power distribution cables. The vessel was out of service for 40 days to carry out repair works.

Investigation by experts showed that the copper pipe that fractured did not match the original design and had a lower wall thickness. There was no record of any previous repairs carried out to the fuel system pipework. The pipe assembly on the other three auxiliary engines appeared to be of original installation comprising of a steel pipe. The spray shield was removed during maintenance and not re-installed. Insulation was also suspected to be inadequate since exposed sections around the exhaust manifold and turbocharger were noticed on other three auxiliary engines. The investigators concluded that the heat shielding arrangements on the fire damaged auxiliary engine did not meet the relevant SOLAS regulations, II-2/2.2.6.1.

In the above case, there are two main aspects which need to be highlighted.

- *First* is the leakage of flammable oil; and
- *Second* is the inadequate protection to prevent highly flammable fuel from coming in contact with a source of ignition.

Leakage or spray of fuel due to a failure in the oil system

Below we list some of the most commonly occurring causes of fuel spraying from low pressure piping systems. The list is by no means exhaustive, but a review of past Gard cases has shown that below listed failures occur frequently.

Piping, piping connections and other associated components, such as o-rings, were not original parts or of a type recommended by the manufacturer. In some cases, modifications had been done by the crew under existing management, whilst in others the crew were not aware of such modifications as they had been done under previous ownership or management.

- Piping connection had not been tightened to the required torque and with time it loosened due to, for example, vibrations. Another reason may be incorrect assembly after maintenance.
- Bolts for flanges or filters breaking due to fatigue caused by overtightening over a period of time. In some cases, securing bolts were also found loose or missing altogether.
- Fatigue fracture of pipes. Such pipes are typically not well supported along their entire length, which causes excessive stress due to vibrations. Lack of support may be attributed to the design or failure to reinstall the holding brackets after maintenance.
- Fuel oil filter covers coming loose and displacement of the spindle from the top cover for various reasons.
- Rupture of rubberized hoses due to degradation caused by the heat generated from nearby machinery.

Oil coming in contact with hot surfaces

Shielding can either be by insulating hot spots with thermal insulation or anti-splashing tapes, and/or by using physical barriers such as spray shields. Some typical issues with insulation which we have seen in our claims portfolio are:

- the quality may differ from yard to yard,
- it can deteriorate with age,
- it may not have been fixed back properly after maintenance, and
- it can become soaked with oil over a period of time due to minor leakages.

As for physical barriers:

- they may not have been part of the original design and therefore not fitted, or
- where fitted, they may not have been installed back in place after maintenance has been carried out on the oil system, as in our case study, and as time passes may even be misplaced.

Older vessels need more attention

One of the factors which must be considered when assessing fire risks in engine rooms is the age of vessels. The risk of leakages from machinery may increase as ships grow older. We discuss this further below but highlight here some of the main issues that can increase the risk of fire in the engine room on older vessels.

- Protection of hot surfaces may degrade, with the quality of insulation may deteriorating thereby increasing the probability of ignition and risk of fires.
- Older vessels can face cuts to their maintenance and safety budgets as they near the end of their service life.
- A vessel may have changed ownership and management a number of times during its life, and this can have a direct impact on the consistency of maintenance in the engine room.

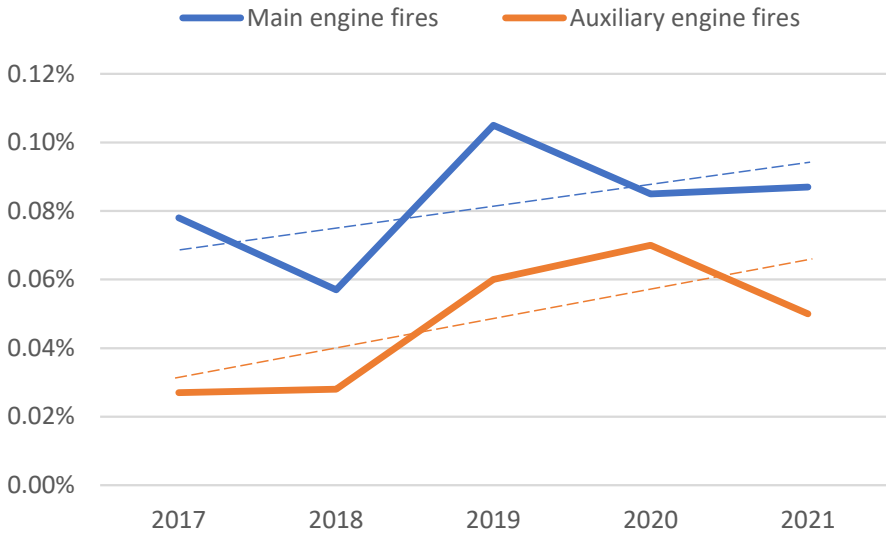
Typical hotspots in the engine room

Based on previous fire incidents handled by Gard, we have found that the below listed areas acted as a source of ignition in most cases. The temperature of these areas can easily exceed 500 °C which may be well above the oil's auto ignition temperature.

- Exhaust manifold, pipes and associated flanges
- Exposed areas of boilers
- Turbochargers
- Indicator valves on cylinders
- Heater for purifier units
- Electrical wires/components and switchboards.
  Melting or smoldering of cables can also contribute to the transmission of heat

Data insights – do the numbers tell their own story?

In Gard, when analyzing trends, we, just like Cefor (The Nordic Association of Marine Insurers), follow closely the frequency trends of incidents over a given time period. This way we are also able to account for the growth in our portfolio from one year to the next. Over the five-year period, from 2017 – 2021, the frequency for the various Hull and Machinery (H&M) claims areas is showing a downward trend except for fires in engine room. This rise is largely due to fires occurring either on main engines or auxiliary engines which, as mentioned earlier, make up majority of all engine room fires.



Frequency of engine fires (GARD H&M data)

For the period 2017 – 2021, the average annual frequency of engine room fires is 0.13%, which means out of every 10,000 vessels, 13 vessels have had one such fire incident each year. This may not seem like a high number, but the consequences of such fires can be serious for human life, environment, and property causing significant business losses.

One of the main concerns is that the frequency of both main and auxiliary engine fires shows a rising trend. The highest frequency of fires on main and auxiliary engines is seen on passenger and container ships. It is almost twice the Gard 5-year average. Within the container ship segment, the frequency is the highest for feeders (<3,000 teu).

Age as a factor

We mentioned earlier that age is one of the factors to consider when assessing fire risks. Our data shows that older vessels are more prone to fires originating in engine room and frequency peaks for vessels between 25 – 30 years age. Interestingly, concentrated inspection campaigns (CIC) by Port State Control MoUs on 'Fire Safety Systems' carried out a few years ago concluded that the rate of detention for vessels failing certain CIC items seemed to increase as ships get older.

Recommendations

Failure in an oil system followed by deposit of oil onto a high temperature surface is the leading cause of engine room fires. We have following three key recommendations which can help owners, managers and their crew reduce the risk of such fires occurring.

1 *Identifying sources of leakages:* Checking fuel and lube oil pipes for loose fittings, missing bolts on flanges, non-metallic hoses in areas where the temperatures can exceed the oil's ignition point etc., from where oil can spray onto hot surfaces should be part of the vessel's planned maintenance system. It is recommended that the assessment to identify potential sources of leakages be done on a regular basis.

   Also look out for whether the components of the oil piping system are original and meet the manufacturer's specifications. This is particularly important when taking over a second-hand ship either under management or ownership.

2 *Mapping hot surfaces using thermography:* Owners/managers can incorporate the use of thermography onboard for detection of hot surfaces and for checking insulation during normal operations. Owners should consider including thermographic examinations in newbuilding specifications and have such tests carried out during sea trials. A thermographic examination of the engine room and the vessel's electrical installation should be carried out periodically with engines and electrical equipment running.

3 *Shielding hotspots Insulation:* As materials used to insulate high temperature surfaces may degrade over time or become oil-soaked, regular checks should be carried out. Even if the insulation of an exhaust pipe / system appears to be in good order, there may be hidden inadequately insulated areas and smaller open hot spots which could start a fire if in contact with oil.

   Spray shields: The position and condition of spray shields for both high and low pressure flammable oil lines should be checked regularly, as should the drainage arrangements for jacketed fuel oil pipes. Where spray shields are not included in the original design and the area has been identified as a potential 'source of oil leakage' then the installation of spray shields should be considered. Particular attention should also be given to the immediate and proper refitting of spray shields and insulation materials upon completion of maintenance.

Making sure that the piping met the original specs, reinstalling the spray shield after maintenance, and using thermography to identify the exposed sections in the insulation around the turbocharger and exhaust manifold of the auxiliary engine would have prevented the fire from occurring.

This article was first published on Gard Club's website and is printed here with our thanks.

EMSA gives first factual analysis of maritime safety landscape in the EU

The European Maritime Safety Report (EMSAFE) has been prepared to give the first factual analysis of the maritime safety landscape in the European Union (EU). This first edition of the report, prepared by the European Maritime Safety Agency (EMSA), provides a comprehensive and factual overview of a wide range of maritime safety topics, as well as an in-depth analysis of specific technical areas.

Overall, it can be concluded that the EU has developed a robust maritime safety system. However, many challenges lie ahead of us. One thing is certain – lessening our safety efforts cannot be an option. On the contrary, to avoid a return to the era of sub-standard shipping which manifested itself in accidents like that of the Erika, or the Prestige, the EU should continue investing in and reinforcing its maritime safety framework. The strong safety framework constructed over the past two decades by the maritime community, national administrations, shipowners, shipyards, equipment manufacturers, recognised organisations, and port state control functions, among others, is a legacy that should never be lost. EMSA, in the year of its 20th anniversary, is proud to have contributed to this effort, and is committed to continue to provide full support to the EU maritime community, now and in the future.

The EU Member State fleet

The size of the EU Member State fleet is an important indicator of its relevance within the global maritime transport sector; its distribution per ship type helps to focus safety efforts on specific areas of concern.

Passenger ships currently make up 19% of the fleet; they represent the highest proportion of all ship types within the sea-going fleet (excluding fishing vessels), of which 45% are RoPax. Their average age is approximately 28 years, the oldest of all major ship categories.

The EU Member State fleet represents around 18% of global tonnage (GT), which in itself encompasses over half of all RoPax and high-speed craft (HSC) in the world by GT. Both of these ship types have been accorded dedicated instruments in the EU legislative acquis, recognising both their specific characteristics and their role in transporting millions of passengers every year through EU waters.

The growth of the EU fleet, both in number of ships and in tonnage, is lower than that of the global fleet. For example, an overall increase of 3.4% has been observed in the number of ships registered to EU Member State flags in the last 5 years, showing a slower increase than that of the world fleet, which grew by 7%.

EU Shipbuilding and marine equipment manufacturing In 2020, 8% of all new build activity in the world, based on the number of ships, was generated by shipbuilding industry in Europe, corresponding to 3% of the worldwide gross tonnage built in that year. Almost half of this figure is related to the construction of cruise ships. With Asian countries entering the cruise shipbuilding market, the future of EU shipyards, and the associated economic activity that they support, is in doubt. Contrary to this, the European marine equipment industry is a world leader in a wide range of products, with a global market share of 35%. However, these EU manufacturers could be affected by decreasing shipbuilding activity in the EU.

Maritime traffic and safety

The EU's waters are among the busiest in the world, something that has a direct impact on maritime safety, with more than 680,000 calls to EU ports in 2020. Nearly a quarter of all ships that visited EU ports over the past five years were flagged to non-EU Member States, almost all (92%) registered to countries under the Paris MoU white list, i.e., with good safety records.

During that period, only 5% of non-EU Member State-flagged ships visiting ports here were registered to countries with some safety issues (listed in the Paris MoU grey list) and only 3% were registered to countries with more significant safety issues (listed in the Paris MoU black list). The top three non-EU Member State-flagged ships visiting EU ports came from Panama, Antigua & Barbuda, and Liberia.

The interchange of information is essential for safety. The main challenges here include the reduction of the number of mis-declared hazardous materials (hazmat) cargoes and the operationalisation of a true European Maritime Single Window to increase the data quality, facilitate cooperation, and reduce administrative burdens.

Seafarers and safety

Qualified seafarers are essential to ensuring the safety of ship operations and are vital for the future of the maritime sector. There are currently approximately 330,000 masters and officers holding certificates of competency that allow them to serve onboard EU MS flagged ships, close to 40% of them from nonEU countries. However, the age profile of seafarers is increasing, and recruitment and retention of those who work on board ships remains a challenge for the future.

The seafaring profession is one of the toughest in the world, and the contribution of sailors to the global economy should not be underestimated, especially in crisis situations like that of COVID-19, which also demonstrated the vulnerability of their conditions.

Long days at sea, often in bad weather conditions, together with intense activity in port, contribute to physical and mental fatigue. Port state control (PSC) inspections show that around 25% of all deficiencies found are related to the human element, most of them within MLC Title 4 which deals with healthcare, safety protection and accident prevention among seafarers. In addition, increased automation on ships is bringing new challenges to the profession.

Ship safety standards

The cycle of proposing, discussing, approving, and implementing new safety requirements is a complex and lengthy process. For example, the issue of fire on RoPax vessels was first highlighted in 2015 after the Norman Atlantic disaster, in which 11 people lost their lives. The new standards developed to tackle this problem are only likely to become mandatory in 2026.

In most cases, the upgraded standards are not applied retroactively, due to their disproportionate economic and technical impact, meaning that safety changes can take decades to impact on the fleet. A good example is the damage stability requirements for passenger ships. An analysis of the EU Member State flagged fleet shows that almost 40% of the passenger ships currently in operation were built before 1990.

Since then, the damage stability requirements have been significantly upgraded three times. Fire safety on RoPax, the carriage of alternative fuelled vehicles on ships, the interface between the ro-ro industry and road transport, the lack of harmonisation of fire safety standards for materials other than steel, small passenger ships, fires on containerships, the increase of automation, and the general adoption of the e-tag for marine equipment are some of the challenges that will be faced in the near future.

Fishing vessels

There are close to 75,000 fishing vessels registered in the EU-27. They present a high vulnerability to accidents, in that 50% of all the accidents involving fishing vessels are either very serious or serious, whereas the average for all ship categories is 27%. In addition, even though fishing vessels represent 17% of the total number of ships involved in accidents reported, the number of fishing vessels lost represents more than 55% of total number of lost vessels, a trend observed in recent years. The international convention dealing with the safety standards of fishing vessels, the Cape Town Agreement, is not yet in force. At EU level, Directive 97/70/EC establishes minimum safety requirements for fishing vessels above 24 metres in length (3% of the fleet).

Enforcement

The implementation of maritime safety legislation in the EU is the responsibility of Member States in their capacities as flag, port, and coastal States. Notable here is the work done by all port state control (PSC) inspectors in the EU, with more than 14,000 inspections carried out each year. At least one deficiency is found in one out of every two inspections, and more than 50% of all deficiencies recorded are safety-related (falling under the International Convention for the Safety of Life at Sea (SOLAS)).

Deficiencies related to fire safety are most frequently reported, regardless of ship type. For example, 39% of the SOLAS deficiencies found on RoPax ships are related to fire safety, a percentage similar to that found in the special regime inspections for RoPax and highspeed craft (HSC), where almost 40% of deficiencies found relate to fire safety.

Download the pdf report in full at **https://bit.ly/3bgsFiP**

In addition, several thousand flag inspections are carried out each year, but as there is no centralised database of this activity, it is not possible to analyse the deficiencies found. Flag States are delegating more and more competencies, especially in the execution of statutory surveys, to recognised organisations (RO). This means that part of the knowledge and experience of EU Flag States is effectively being outsourced, which reinforces the importance of retaining centralised EU expertise.

There are in total 12 recognised organisations in the EU, regularly assessed by EMSA on behalf of the Commission, out of around 100 operating globally, which should be overseen by the relevant recognising flags. The IMO audits of flag states (IMSAS) show that, with respect to the delegation of authority to RO, the most recurrent findings are related to weaknesses in the administration's oversight programme. In addition, according to a submission to the IMO from the Paris and Tokyo MoU, it can be concluded that this oversight is not carried out effectively by a number of flag states, resulting in certain instances of underperformance by organisations, with the subsequent consequence of having lower safety standards in practice.

At EU level, EMSA visits Member States on behalf of the European Commission to verify the implementation of EU maritime legislation in areas like marine equipment, the loading and unloading of bulk carriers, accident investigation, PSC, vessel traffic and monitoring systems, etc. This has resulted in more than 300 visits which are followed up with corrective measures. In addition, these visits promote the establishment and interchange of best practices.

When accidents happen

Regardless of all the mechanisms set up to prevent them, accidents still happen. Over the past five years, an average of 3,200 accidents occurred annually onboard ships. These accidents all fell under the scope of applicable EU legislation which excludes, among others, fishing vessels of less than 15 metres in length.

Serious and very serious accidents represented 24.9% and 2.4%, respectively, of all accidents reported. In 2019, 71 people lost their lives and almost 1,000 people were injured in these accidents. Therefore, it is essential to maintain an appropriate safety net to respond to accidents. Places of Refuge are one of the tools available in the EU to accommodate ships in distress. The EU Guidelines on Places of Refuge are regularly tested through tabletop exercises organised by EMSA and the European Commission to ensure readiness.

Search and Rescue, under the remit of Member States, is another essential element of accident response. The extended use of new technologies, like RPAS and satellite-based Earth observation services, could support the work of the relevant authorities in this field.

Forthcoming safety challenges

Efforts to reach emission targets as part of the European Green Deal should go together with efforts to keep ships safe, especially given that the use of new fuels (LNG, hydrogen, LPG, methanol, ammonia, and biofuels) and power technologies (batteries and fuel cells) comes with associated safety risks.

Moreover, the shift to alternative fuels is not limited to maritime transport. Here in the EU, alternatively fuelled vehicles have increased in number by 29% between 2019 and 2021, meaning that both passenger and cargo ships need to prepare for the safety risks of transporting these vehicles.

In addition, autonomous ships not only offer new opportunities for industry, but also bring challenges in the regulatory field (including the need to develop a legal framework, terminology, liability, standards, among others) and the technological field (the decision systems to replace the critical decision making of the crew in avoiding collisions, reacting to, and avoiding, bad weather conditions, cyber security, etc.). Nevertheless, the automation of ships will be gradual, with remotely controlled, highly autonomous ships sailing on the same routes and calling at the same ports as traditionally manned ships. Difficult to predict challenges may arise in terms of surveys, manoeuvres at sea and in port, and the qualifications of those on board, among others.

Is the world finally starting to take the dismantling of end of life boats seriously?

5,000 boats dismantled in France

The Association for Eco-Responsible Pleasure Craft (APER) has dismantled more than 5,000 since it was set up three years' ago.

Photo credit APER

The figures released by the French organisation, which is financed by boat builders, approved dismantling centres, administrations, local authorities and marinas, show 33% of the boats were motorboats, around 32% were small sport sailboats – both monohulls and multihulls and just over 29% were monohull sailboats.

The figures include the dismantling of more than 1,100 boats that have been collected from sailing clubs since a partnership was signed with the French Sailing Federation in 2020, with APER undertaking to finance the transport and processing of old school boats.

"The wrecks, dilapidated hulls and scattered sucker boats on our banks and shores, our gardens, our marinas, are not inevitable," said Jean-Paul Chapeleau président de l'APER.

"Get rid of, deconstruct, recycle and recovering pleasure boats at the end of their life, this is the mission that APER has set itself, under the impetus of the Federation of nautical industries."

The organisation works to help boatbuilders and owners from the concept and design including choice of materials through to production and then the end of life of the boat.

State-wide 'turn-in' project for end of life boats in Florida


Photo credit: FWC

A new programme in Florida has been established to tackle the issue of end of life boats and reduce the number of derelict vessels along the state's waterways. The Florida Fish and Wildlife Conservation Commission (FWC) has established a statewide Vessel Turn-In Program (VTIP) as part of the Derelict Vessel Prevention Program. The new rule will create a voluntary program to remove at-risk vessels before they become derelict, in an effort to help Florida's environment and public safety.

Rule changes have been advanced to help speed the removal of privately owned boats that have been abandoned, wrecked, junked or substantially dismantled in state waters. The VTIP would be open to people who in the past 18 months have received notices three times for at-risk conditions. The vessels would need to be owned outright by the participant, with no loans or finances owed on the boat. For participants in the program, the commission will declare vessels a public nuisance and pay for removal from the water and eventual destruction.

Derelict vessels are more costly and complicated to remove than at-risk vessels. The FWC says a VTIP will prevent vessels from becoming derelict by removing them from the state's waters when they are at risk of becoming derelict, which will result in cost savings for taxpayers and ultimately fewer DVs appearing on Florida waters. The VTIP is designed to allow owners of vessels at risk of becoming derelict the ability to voluntarily turn the at-risk vessel over to the state for removal and destruction.

"Commissioners receive numerous contacts from the public about derelict vessels and I know the establishment of this new program will really make a difference," says FWC Chairman Rodney Barreto.

According to the FWC, derelict vessels cause the destruction of valuable seagrass resources and endanger marine life. They also threaten human life, safety and property as they drift on or beneath the surface of the water or block navigable waterways, posing a navigational hazard to the boating public. The commission is currently handling 730 derelict-vessel cases.

Containers Lost at Sea

2022 Update

In 2021, the international liner shipping industry transported approximately 241 million containers, with cargo transported valued at more than $7 trillion.[1] Proper packing, stowage and securing of containers and reporting of correct weight are very important to the safety of a container ship, its crew, and its cargo, to shore-based workers and equipment, and to the environment.

However, even with proper packing of the cargo into the container, correct container weight, and proper stowage and securing aboard ship, several factors ranging from severe weather and rough seas to more catastrophic and rare events like ship groundings, structural failures, and collisions can result in containers being lost at sea. Since 2011, the World Shipping Council (WSC) has undertaken a survey of its members to accurately estimate the number of containers that are lost at sea each year. The WSC's member companies operate more than three quarters of the global containership capacity; thus, a survey of their losses provides a valid basis for a meaningful estimate of the total number of containers lost at sea.

The 2022 update gathered information from years 2020 and 2021. The recent survey results, explained in more detail below, show that containers lost overboard represent less than one thousandth of 1% (0.001%) of the roughly 241 million packed and empty containers currently shipped each year.

1 | *WSC 2022*

Survey Methodology

In each of the surveys conducted in 2011, 2014, 2017, and 2020 the WSC member companies were asked to report the number of containers lost overboard for the preceding three years. However, the winter of 2020-21 saw an unusually high number of incidents. Although so far in 2022 there have been few incidents involving containers lost at sea, the industry is deeply concerned about this development.

WSC is therefore, in addition to other measures described in this report such as the TopTier project, increasing the frequency of updates to its Containers Lost at Sea report. Hence, this update covers 2020-2021 and, going forward, a survey will be carried out each year.

Up to date data on the number of containers lost at sea is important for the work under way to increase safety and help guide the need for any additional initiatives by WSC, governments and other parties.

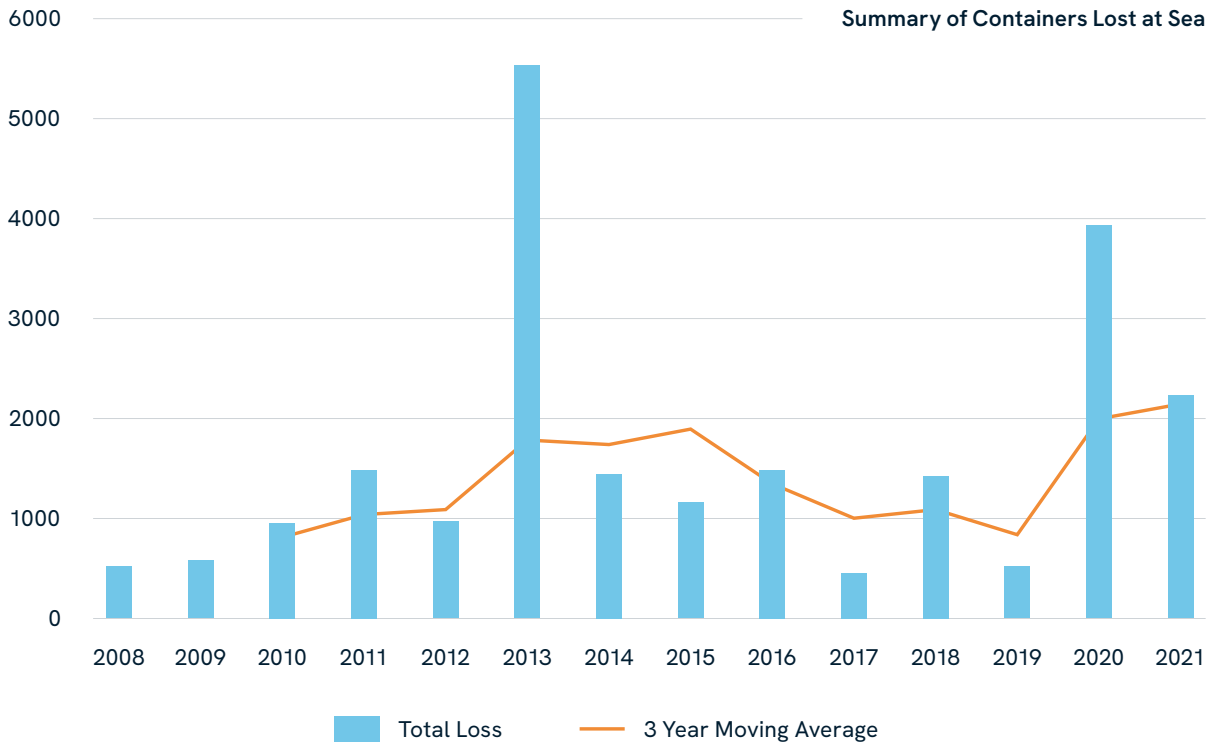
For the 2022 update, members were asked to report on losses for 2020 and 2021. All WSC member companies responded and together they represent approximately 80% of the total global vessel container capacity deployed at the time of the survey. WSC assumes for the purpose of its analysis that the container losses for the 20% of the industry's capacity that is operated by carriers that did not participate in the survey would be roughly comparable to the losses reported by the responding carriers representing 80% of the industry's capacity.

The total annual figure reported by WSC members is adjusted upward to provide an estimated loss figure for all carriers, both WSC members and non-members, to arrive at an estimate of total containers lost. As expected, some carriers lost no containers during the period, while others experienced a significant incident where hundreds of containers were lost in a single event.

There are more than 6,300 ships carrying containers around the world at any point in time. All containers lost at sea represent safety and environmental hazards regardless of how and when those containers were lost. Accordingly, the 2022 Update to the Containers Lost at Sea Survey includes the total number of containers lost at sea, regardless of how they were lost.

We continue to work with governments and other interested stakeholders to identify losses, their causes, and actionable solutions to reduce the losses in the future.

Analysis of the Fourteen-Year Trends



Reviewing the results of the fourteen-year period (2008-2021) surveyed, the WSC estimates that there were on average a total of 1,629 containers lost at sea each year, which is a significant increase (18%) to the average annual loss for the twelve-year period ending in 2019.

It can be helpful to also compare the current results to the trend of three-year averages that were reported in each of the previous updates. In the first period (2008- 2010), total losses averaged 675 per year and then quadrupled to an average of 2,683 per year in the next period (2011-2013). This was due in large part to the sinking of the MOL Comfort (2013) that resulted in a loss of 4,293 containers and further impacted by the grounding and loss of M/V Rena (2011) resulting in approximately 900 containers lost.

The next period (2014-2016) was marked by another vessel sinking with the tragic total loss of the SS El Faro (2015) with 33 crew members and 517 containers. Even with that, the three-year average annual loss for the period was 1,390, about half that of the previous period. The downward trend continued into 2017-2019 when the 3-year average annual loss was almost halved again to 779. There were also no individual losses as significant as those noted in the previous periods. This was a positive trend that seems to have reversed with the latest update.

The average losses for the two-year period 2020-2021 have increased to 3,113 from the 779 of the previous period. A significant loss occurred in 2020 when the ONE Opus lost more than 1,800 containers in severe weather. The Maersk Essen also experienced severe weather in 2021 that resulted in the loss of some 750 containers. Such large losses in a single incident have not been reported since the 2014-2016 period.

Container Safety - an Ongoing Daily Task

From a liner shipping industry perspective, every container overboard is one too many, and everyday carriers work with the other parties in the supply chain to enhance safety.

The responsibility for container safety is shared across the supply chain:

- When dispatching the empty container, the container operator is responsible for ensuring that the container is clean, free from visible pest contamination, and is fit for purpose and complies with applicable requirements.
- Every party that handles the container along the supply chain is responsible for checking that it is in good and clean condition, and for handling it so it remains so.
- Specifically, the shipper, packer and freight forwarder are responsible for the container being packed, braced and stowed safely in accordance with the CTU Code[2], that the contents shipped are safe and free from visible pest contamination, and that the gross mass of the packed container is verified and together with the contents are correctly declared to the carrier in accordance with applicable timelines.
- The port terminal and stevedores are responsible for the proper handling of the container and that it is stowed properly based on its verified gross mass (VGM), content, and destination in accordance with the ship's Cargo Securing Manual (CSM) as approved by the flag state and the IMDG Code.
- The vessel operator is responsible, in cooperation with the terminal and any vessel-sharing partners, for making a safe stowage plan based on the information received, monitoring the stowage, and securing the containers safely in line with the CSM and that, where required, containers are segregated.

2 | *IMO/ILO/UNECE Code of Practice for Packing of Cargo TransportUnits available at https://www.imo.org/en/OurWork/Safety/Pages/CTU-Code.aspx*

How the cargo is packed and stowed in the container by the exporter, or shipper is key to safe transport – both on sea and on land. The most important thing the shipper can do to prevent losses is to make sure that cargo is conscientiously and correctly packed, declared and placarded, and in line with applicable rules and regulations (e.g. the IMDG Code) and the guidance set out in the CTU Code. To facilitate this, the Cargo Integrity Group – where WSC is a founding member – has developed a short CTU Code Guide and a practical Container Packing Checklist to make the information in the CTU Code more accessible and easier to use for all parties in the supply chain. The CTU Guide and Checklist are today available in Arabic, Chinese, English, French, Russian, Spanish and Italian.

The content and gross mass of the containers are crucial information when loading the vessel. Containers are placed according to the cargo stowage plan to ensure a balanced vessel (e.g., heaviest containers at the bottom of the stack and the lightest on top) and to minimize risks (e.g., cargo categorized as flammable placed away from crew quarters, fuel tanks and other flammable cargo). Container vessels are designed to transport containers safely and many precautions are taken to avoid that container are lost or dislodged even if under extreme stress. Containers are secured in the hold in racks and lashed together with steel bars and locks to be secure and stable. The same is required for containers stowed on deck.

These arrangements are inspected for safety, including ensuring that the lashing gear is maintained. When planning the journey, operation centers on land together with the vessel master and crew plan for it to be as safe as possible, using weather routing before and during the journey to avoid dangerous conditions by adjusting the vessels route or speed where required.

Active Safety Improvement Initiatives

The liner shipping industry works continuously to further enhance container safety, partnering with governments and other stakeholders to reduce the number of containers lost at sea. These are some of the main initiatives under way:

- **MARIN TopTier Study:** Triggered by the events late 2020 and early 2021, WSC and several of its Member lines are among the partners in the MARIN TopTier project. This project will run over three years and, based on scientific analyses, studies, and desktop as well as real-life measurements and data collection, aims to develop and publish at regular intervals specific, actionable and effective recommendations, developed by six different working groups, to increase container safety.

  Initial results from the study show that parametric rolling in following seas is especially hazardous for container vessels, a phenomenon that is not well known and can develop unexpectedly with severe consequences. To help in preventing further incidents a Notice to Mariners has been developed, describing how container vessel crew and operational staff can plan, recognize and act to prevent parametric rolling in following seas.

  The project will be reporting on progress and sharing insights on a regular basis with a submission planned for CCC 8 that is scheduled to discuss, among other things, stowage position surveys, responses to questionnaires to ship crews on container handling and stowage, and a gap analysis. Many more topics, tests and measurements are planned to be undertaken by the six working groups during the project.

- **Revision of the IMO's guidelines for the inspection programs for cargo transport units, including containers: MSC 105 (April 2022) approved** to amend the IMO guidelines for CTU inspection programs in order to: 1) clarify that the scope of application is to CTUs carrying all types of cargoes, not just those declared to be carrying dangerous goods; 2) adequately refer to the CTU Code; 3) to allow for inspection reports from non-governmental organizations to be included; and 4) to include inspection for visible pest contamination. WSC participated actively in the revision work.

- **Discrepancy in container stacking strength:** WSC, working together with IMO Member governments and other industry associations, proposed to the IMO's Sub-Committee on Carriage of Cargoes and Containers (CCC 6) in September 2019 to align the Safe Container Convention (CSC)'s and ISO 1496-1 container stacking strength requirements, noting that the existing discrepancy might have significant safety implications, including collapsed container stacks and containers lost at sea. This is an issue that is now being considered as part of the MARIN TopTier project.

- **Mandatory reporting of containers lost at sea:** Presently, at the international level, there are mandatory reporting requirements for containers lost overboard that are declared to contain dangerous goods and marine pollutants. However, there are not yet comparable international mandatory reporting requirements for containers lost overboard, irrespective of their declared content. WSC is a co-sponsor of a submission to IMO's Maritime Safety Committee (MSC) 102 by the European Union with a proposal for a new output on the mandatory reporting of containers lost at sea. The liner shipping industry supports such a mandatory reporting requirement and will continue to advocate for its early implementation.

Improvements Achieved

The liner industry has been engaged in this safety effort over two decades, and working with our partners in the supply chain there has been quite some progress, including in regard to:

- **Amendments to the Safety of Life at Sea (SOLAS) Convention:** On July 1, 2016, changes to the Safety of Life at Sea (SOLAS) convention requiring verification of container weights before packed containers may be loaded aboard ships went into effect. This is an effort WSC advocated in support of for many years. The requirement makes container gross mass verification (VGM) a legally binding condition for vessel loading. Mis-declared container weights have contributed to the loss of containers at sea, as well as to other safety and operational problems.

- **Code of Practice for Packing of Cargo Transport Units (CTU Code):** The IMO, the International Labour Organization (ILO), and the United Nations Economic Commission for Europe (UNECE), with industry support, produced a code of practice for the packing of CTU, including containers, outlining specific procedures and techniques to improve safety, such as how to ensure correct distribution of the weight inside the container, proper positioning, blocking and bracing according to the type of cargo, and other safety considerations. The code was approved in late 2014, and informal work to revise it has commenced.

- **Revised ISO standards for container lashing equipment and corner castings:** In support of the IMO's efforts to enhance container safety, the International Organization for Standardization (ISO), with the industry's active participation, revised its standards regarding lashing equipment and corner castings and the new standards went into effect in 2015. The corner casting standard is poised to be revised in the near future.

For more information about this and other initiatives related to the improved safety of handling containers, visit: Safety — World Shipping Council.

There are over 6,300 containerships continuously operating on the world's seas and waterways linking continents and providing vital supplies to communities around the globe. The liner shipping industry's goal remains to keep the loss of containers carried on those ships as close to zero as possible. We will continue to explore and implement preventive and realistic measures to make that happen and welcome continued cooperation from governments and other stakeholders to accomplish this goal.

Original Article: World Shipping Council Report, Containers Lost At Sea - 2022 Update

Eliminating the risk of container stack collapse

- solutions and unseaworthiness -

*An opinion article by **Captain Glenn Mathias**, Australian Maritime Consultancy*

The World Shipping Council (WSC) claims that its member companies operate about three quarters of the world's global containership capacity. In their Containers Lost at Sea 2020 – Update, they reported that the 3-year, 2017-2019, average annual loss of containers overboard was 779 units – a number adjusted upwards to include non-member companies. (The WSC has maintained such statistics since 2011). However, while the statistics end in 2019, the container vessel One Apus lost 1816 containers overboard in November 2020 and the Maersk Essen lost about 750 containers in January 2021.

When containers fall off a vessel, those that do not sink immediately pose a risk to small craft such as fishing vessels, whose hulls would not withstand the force of contact with a container's side rails or worse, its corner castings. And of course, contact with a recreational or charter boat could be tragic. The risks associated with containers washing ashore and damaging coastal works including jetties; their contents, including dangerous goods, strewn along coastlines and tourist beaches; their effects on the food chain, marine fauna and flora are a discussion for another day. Comfort can be drawn from the fact that no crew injuries from flying projectiles and dangerous liquids ejected from collapsed and/or damaged containers, have been reported - yet.

The principal factors contributing to container stack collapses are two known defects: first, containers loaded contrary to the Container Securing Manual (CSM), such as heavy containers over lighter ones; and container stacks exceeding permissible weight limits; secondly, container stacks not secured as block units. While investigative reports include the defect associated with the CSM, the writer has not seen, (but acknowledges there could be), reports that refer to container stacks not being secured as block units. (Other contributory factors such as loose and/or degraded container securings and the commercial pressures on masters to navigate through the storm rather than around it to maintain schedules, could be overcome by shipowners exercising due diligence). But, while ever the two known defects exist, the risk of container stack collapses remains.

This article proposes solutions to eliminate the risk of container stack collapses first, by ensuring that container loading plans comply with the CSM, through computerised loading programs with fail-safe mechanisms; secondly, by making the Designated Person Ashore (DPA) responsible for oversighting container loading plans; and thirdly, by ensuring that container stacks are secured as block units. The article also proposes research for a safer container securing system; considers the seaworthiness of vessels at the commencement of their voyages with the two known defects; and the issue of cost to rectify the defects.

Containers loaded in compliance with the CSM

It is accepted practice that container loading plans are prepared by shore planners using the computerised loading programs and CSMs, provided by shipowners. This arrangement has been adopted by shipowners because, apparently, neither the master nor the chief officer, has the time or the capability to prepare such plans. Shipowners know that loading plans often do not comply with the CSM resulting in containers being loaded onto vessels in breach of the CSM. Shipowners also know that stevedores disregard loading plans, such as when a container next in the loading sequence, cannot be located. To avoid a possible delay to the sailing schedule, stevedores will load the next available container, regardless of consequences. The GARD Guidance on Freight Containers 2016/Jeroen de Haas explains how shore planners and stevedores, without knowledge of vessel stability, breach the CSM:

As previously indicated, the CSM is valid only for certain GM values, which is problematic if the ship operates at a higher GM value. The following are typical examples which describe the problems and explain the need for lashing software

The same CSM shows that in a certain bay on deck the containers can be stacked six tiers high, and that the tier weight from the base to the top is: 30 t, 20 t, 20 t, 15 t, 10 t, 7 t. The maximum stack weight is then 102 tonnes. However, containers are never loaded exactly as prescribed by the CSM. If, for example, the container in the bottom tier weighs 21 tonnes instead of 30 tonnes, the first instinctive reaction may be that the forces will be less than the example given in the CSM, and the stowage would therefore be safe. However, the opposite is the case as less weight in the bottom tier will create higher forces as the centre of gravity of the stack moves upwards.

CSM breaches are not restricted to 'shore' planners: Annabella MAIB Report No 21/2007:

[1.4.1] The stowage plan for the cargo to be loaded onto Annabella was planned by the charterer, Unifeeder, at its offices in Aarhus, Denmark. The company had 41 vessels on charter at the time of the accident and employed 4 full-time and 1 part-time planners in its operations department who prepared the cargo stowage plans for all of these vessels. The planners were aware of Annabella's stowage capabilities and also held some details of her stability. However, they ultimately relied on the vessel's staff to alert them to any errors in the stowage plan and expected the chief officer to critically check every aspect of the stowage plan before the vessel began loading.

[1.4.2] After the accident, a simulation of the collapsed stack load was carried out and it was found that the planning software had not been programmed to recognise 30 foot containers. It transpired that when this size was entered into the programme, it was automatically changed to 40 foot without any alert being given to the operator.

Shipowners know that Ch VI of the SOLAS Convention places ultimate responsibility on masters, for the safe loading and securing of cargo/containers; and that loading plans are provided to masters perhaps a day, but sometimes hours, before loading commences. This prevents masters, already overwhelmed by officialese, from checking loading plans' compliance with CSMs; and only a brave master would demand more than a few amendments to a non-complying plan due to commercial pressure, self-preservation and delays to schedules. Commercial pressure is described in the Ever Smart MAIB Report No 14/2020, para 2.6:

Regardless of the logistical and commercial challenges faced by the container shipping industry, the guidance provided in a ship's CSM and the warnings given by its loading computer should not be ignored. Ships' masters and C/Os might be able to identify and rectify isolated cargo stowage plan issues, but it is impractical to expect them to address large scale problems such as those identified in this report due to the potential commercial impact such interventions would have. The onus should be on the shore planners to deliver compliant and safe stowage plans.

The extract's last sentence about the onus for compliant and safe stowage plans to be placed on the shore planners, is contrary to masters' obligations under SOLAS.

To ensure that shore planners and stevedores comply with the CSM, the computerised loading programs, as earlier noted, should be designed with fail-safe mechanisms that, inter alia, reject a container allocated to a slot contrary to the CSM. A fail-safe mechanism is a basic feature of computer programs, achievable without sophisticated computer skills. Such a mechanism would ensure that every loading plan, and every container loaded onto a vessel, complied with the CSM, thereby ensuring masters' and shipowners' compliance with their obligations under SOLAS and the Hague/Hague-Visby rules, respectively.

The computerised loading programs of container cranes should have similar fail-safe mechanisms to ensure every container lifted for loading onto a vessel, complied with the loading plan. The fail-safe mechanism would work as follows: the crane would lift a container identified by the computerised loading program as being 10 tonnes, but the crane's weight display would show its accurate weight as, let us say, 12 tonnes. This would cause the crane to cease lifting and emit an audio-visual alarm (relayed to the shipowner's DPA for follow-up action); the crane operator would lower the container to the ground.

Container weights as declared

The declared weight of a container is a sub-set of the computerised loading program because the CSM requires accurate container weights. Receiving ports and/or stevedores could ascertain the actual weight of a container first, when it is lifted off the truck or rail wagon in the port; secondly, during the container's transfer to the stacking area; and finally, during the container's transfer to the crane access area. Each time the container is handled, the equipment, consistent with its design and the work, health and safety (WHS) regime, should display the container's actual weight, enabling detection of a container with mis-declared weight. The fact

that containers with mis-declared weights are being loaded onto vessels is proof that either, ports and/or stevedores are practising wilful blindness to mis-declared weights or the handling equipment's weight function is disabled. Shipowners could enforce detection of containers with mis-declared weights by insisting on handling equipment operating as designed; by requiring ports and/or stevedores to provide DPAs with certification from equipment safety auditors confirming operability of the weight function; and requiring ports to enforce WHS penalties against shippers of offending containers. A measure that would concentrate the minds of shippers of offending containers, would be their international black-listing after one strike, because safety should not require three!

DPA to be responsible for oversighting loading plans

The DPA was recommended by the UKs MS Notice No 1188, (July 1986):

"Every company operating ships should designate a person ashore with responsibility for monitoring the technical and safety aspects of the operation of its ships and for providing appropriate shore-based back-up."

The Hon Mr Justice Sheen, referred to this person in his Investigative Report (para 14.2) into the Herald of Free Enterprise disaster in 1987:

This is very sound advice. It is advice which ought to have been unnecessary. A well-run ship-owning company should have been organised in that manner before receiving the Notice.

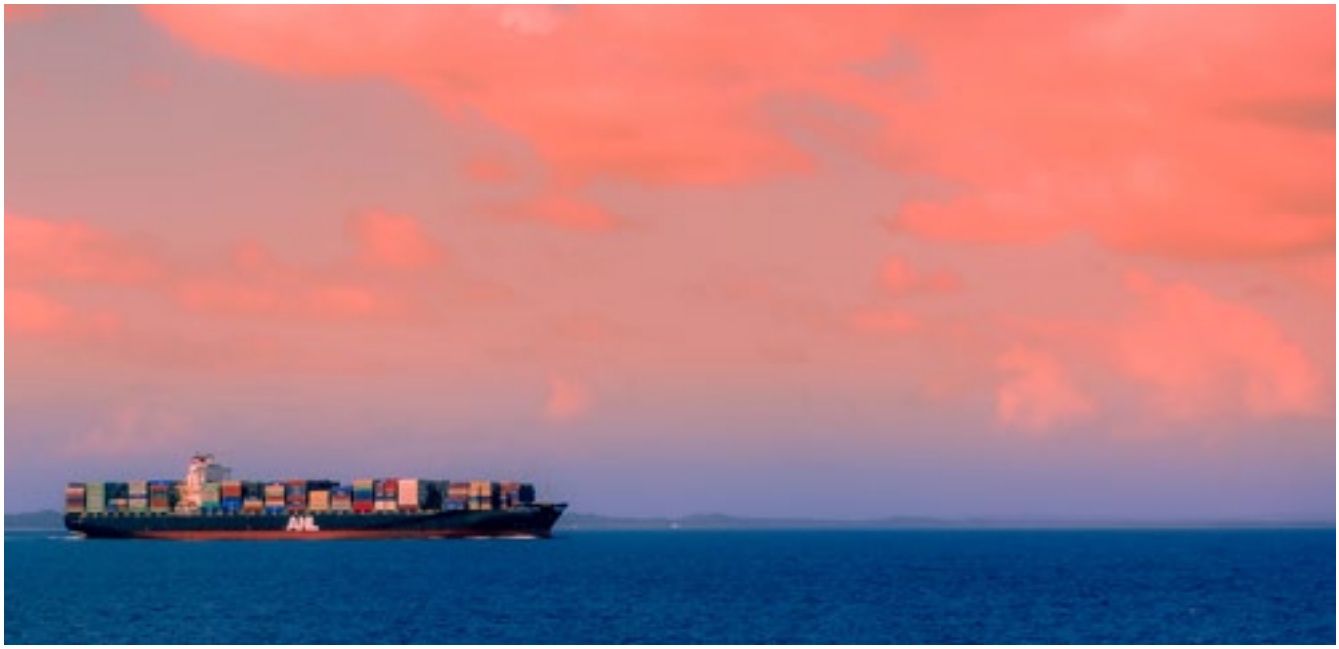
The IMO requires the DPA to have, inter alia, the experience to:

Gather and analyse data from hazardous occurrences, hazardous situations, near misses, incidents and accidents and apply the lessons learnt to improve the safety management system within the Company and its ships.

The required experience indicates that a DPAs responsibility is active rather than passive, because they are required to analyse accidents and apply the lessons or recommendations to their company's ships. DPAs should be made responsible for checking container loading plans' compliance with the CSM, as per of shore-based support to the master. A computerised loading program with fail-safe mechanisms, would facilitate such compliance. The DPA would, as earlier noted, also respond to alerts from container cranes lifting containers with mis-declared weights.

Container stacks to be secured as a block unit

Securing a container stack as a block unit requires lashing bars with turnbuckles, fitted manually between the bases of each tier of containers and lashing eyes or plates on the deck below. With the existing container securing system, only containers stacked three or four high can be secured as a block unit with lashing bars, because the weight of the lashing bars can be handled safely by stevedores. Containers stacked above the 4th tier cannot be secured as block units because the length and weight of the lashing bars required to secure them as block units, are unsafe for handling by stevedores. Because containers stacked above the 4th tier cannot be secured as block units, the container stacks become susceptible to collapse during heavy weather. This means that the existing container securing system is defective. Every shipowner knows that the existing defective container securing system is present on their vessels before, and at the commencement of their voyages. Shipowners who claim ignorance of this defect, leave themselves open to criticism for two reasons: their internal investigation into container stack collapses either on their own, or their competitors' vessels, if conducted with due diligence, would have readily identified this defect; secondly, it would demonstrate wilful



blindness according to the great Lord Denning MR, in The Eurysthenes [1977] QB 49, 68:

"If a man suspicious of the truth, turns a blind eye to it, and refrains from enquiry — so that he should not know it for certain — then he is to be regarded as knowing the truth. The 'turning a blind eye' is far more blameworthy than mere negligence."

And Lord Roskill LJ in the same case (76):

"If the facts amounting to unseaworthiness are there staring the assured in the face so that he must, had he thought of it, have realised their implication upon the unseaworthiness of his ship, he cannot escape from being held privy to that unseaworthiness by blindly or blandly ignoring those facts or by refraining from asking relevant questions regarding them in the hope that by his lack of inquiry he will not know for certain that which any inquiry must have made plain beyond possibility of doubt."

Container stacks above the 4th tier could be secured as block units by using lashing bars long enough to reach between the bases of the highest tier of containers and the deck below, in the manner described: the longer and heavier lashing bars would be stowed on deck vertically, in specially designed storage bins, from which they would be removed by a specially designed device, suspended from the container crane and operated by a stevedore from deck. The device would, amongst other things, have a clamp capable of swivelling about 45° either side of the vertical; a sensor for alignment and an in-built mechanism for self-raising/ -lowering over a distance of about 300 mm. The clamp would grip the lashing bar at a pre-designed location below its swivel-head and lift it clear of the bin (with a stevedore holding its lower end to control its swing). The (device) operator would convey the lashing bar towards the relevant container corner casting, and the device's sensor would detect and align the swivel-head with the casting, self-raising/lowering as appropriate. Once aligned, the operator would move the device towards the casting, enabling the swivel-head to engage with the casting. The device would then self-lower the bar to complete the connection. The clamp would continue to grip the bar until the stevedores had secured its lower end to the deck below, in the usual manner. Thereafter, the operator would release the clamp and convey the device to the next lashing bar.
Removal of a lashing bar would require the clamp to grip the angled lashing bar while the stevedore released its deck securing, and the bar swung vertically from the corner casting. The device would then self-raise until it was aligned and ready to be removed from the corner casting by the operator, who would then convey it to the storage bin.

Research into a safer container securing system

Shipowners, like other business owners, allocate funding readily towards building ships with greater container capacity, in order to increase profits – expected of respectable businesses. (Unfortunately, some shipowners may engage in anti-competitive conduct to increase profits, which has resulted in the establishment of a working group comprising the Australian Competition & Consumer Commission, US Department of Justice and Federal Bureau of Investigation, Canadian Competition Bureau, NZ Commerce Commission and UK Competition and Markets Authority, to consider whether such conduct is prevalent). While expenditure towards increasing profits is good business practice, it is well known that every dollar allocated to safety is provided grudgingly, because safety affects the bottom line and shipowners refuse to grasp the principle of a return on safety. Ironically, since Covid-19, shipowners have experienced profit bonanzas as noted by Drewry on 23 December 2021:

(DMFR), the investment research arm of global shipping consultancy Drewry, remains bullish about continued high stock prices and rising profitability in the booming container carrier sector. The strong performance in the global container shipping sector has generated very handsome spill-over benefits for stock investors. The returns since the start of 2020 have been astronomical.

Asian liner operators were the top performers; with Yang Ming up by 1,583% (as of mid-December 2021), followed by Evergreen Marine's gain of 987% and Wan Hai's 976%. HMM generated returns of 621%. More modest growth was seen in Europe, where Hapag-Lloyd shares increased by 192% and Maersk's by 123%. Clearly, the pandemic and ensuing supply chain crisis that supercharged carrier profits has been the primary driver for the share price bonanza.

The astronomical returns and supercharged carrier profits mean that shipowners have a golden opportunity to fund research into designing a safer container securing system, while still declaring impressive dividends. Shippers, cargo owners, ports and consumers have a right to expect that shipowners, armed with bulging coffers, will act as responsible partners in the supply chain, working to eliminate container stack collapses; preventing risk of injury to crew and reducing the cost of goods to consumers. The consumers bear the heaviest burden with prices marked up by the cargo owners to recoup their triple whammy in losses: paying the deductible/excess; loss of profits and higher premiums at renewal. Cargo insurers also sustain losses because, having reimbursed cargo owners, they often forego recovery of smaller amounts from P&I Clubs because recovery charges make them uneconomical. Shipowners of course, can pass on their losses through higher freight rates.

To eliminate the risk of container stack collapses, shipowners should, as a matter of urgency, appoint a group of experts comprising P&I Clubs, class societies, hull and machinery underwriters, ports, stevedores and manufacturers of containers/lashing equipment. The experts' principal task would be to design a container securing system that secured container stacks as block units, precluding their collapse in heavy weather. The proposed use of heavier and longer lashing bars as earlier described, is to demonstrate the capability of securing container stacks as block units, but importantly, to stimulate ideas towards achieving

block units. The experts may decide to replace steel with carbon fibre, (considered to be superior in terms of weight, tensile and shear properties); or use drones to handle lashing bars. They should also consider the feasibility of stowing moveable securing equipment in the ports rather than on vessels, enabling their maintenance and compliance auditing by DPAs. The availability of expertise, construction materials, technologies and artificial intelligence means that shipowners have no excuse to delay designing a safer container securing system. The experts should not rule out a worldwide competition for a safer container securing system, running in parallel with their task.

Governments have been proactive in requiring seafarers to continually improve their skills and knowledge through courses and revalidation of their certificates of competency. Shipowners cannot sit idly by, content with a container securing system that a disinterested observer such as a consumer, would find primitive.

Seaworthiness of vessels at the commencement of their voyages

It is now appropriate to consider a vessel that commences its voyage the two known defects viz containers loaded contrary to the CSM and with the existing container securing system. Should its container stacks collapse in heavy weather, a court could decide that the vessel was unseaworthy at the commencement of its voyage. The unseaworthiness of such a vessel should be considered in light of the UK Supreme Court's unanimous decision in Alize 1954 and another (Appellants) v Allianz Elementar Versicherungs AG and others [2021] UKSC 51, the CMA CGM Libra. This vessel was found to be unseaworthy at the commencement of its voyage because its passage plan was defective when the vessel commenced its voyage from Xiamen, China. According to the Court, the unseaworthiness of the CMA CGM Libra meant that its owners breached their obligations under the Hague Rules 1924 [sic], Article 3.1:

The carrier shall be bound before and at the beginning of the voyage to exercise due diligence to make the ship seaworthy, properly man, equip, and supply the ship, make the holds, refrigerating and cool chambers, and all other parts of the ship in which goods are carried, fit and safe for their reception, carriage and preservation.

The following extracts are from the Conclusion of the decision at para 145:

(vi) Given the "essential importance" of passage planning for the "safety ... of navigation", applying the prudent owner test, a vessel is likely to be unseaworthy if she begins her voyage without a passage plan or if she does so with a defective passage plan which endangers the safety of the vessel (see paras 124-128).

(x) The carrier is liable for a failure to exercise due diligence by the master and deck officers of his vessel in the preparation of a passage plan for the vessel's voyage. The fact that navigation is the responsibility of the master and involves the exercise by the master and deck officers of their specialist skill and judgment makes no difference (paras 137-139).

The decision is simple: a vessel is unseaworthy at the commencement of the voyage if, at the commencement of the voyage, the vessel's passage plan is defective. The defect in question was the failure to mark, on the passage plan and the working chart – as required by the Guidelines for Voyage Planning – the shallow water areas outside the dredged channel. Shortly after the CMA CGM Libra dropped its pilot outbound from Xiamen, the master, (for reasons best ignored), navigated the vessel outside the dredged channel, at a speed of about 11 knots for about 3 minutes. Not surprisingly, the vessel grounded in shallow water outside the channel. The master explained that, if the shallow water areas outside the dredged channel had been marked on the working chart, he would not have left the dredged channel – an explanation also best ignored. The fact that the owner had provided the vessel with the wherewithal to prepare a compliant passage plan, did not absolve the shipowner from the master's actions.

Applying the above decision to a vessel that commenced its voyage with the two known defects, such a vessel could be considered unseaworthy for breaching:

i. the provisions of Article 3.1 (extracted above; including Hague-Visby); and

ii. the General Principles of the Code of Safe Practice for Cargo Stowage and Securing (Code), two of those principles being: (i) Personnel planning and supervising the stowage and securing of cargo should have a sound practical knowledge of the application and content of the Cargo Securing Manual; and (ii) Decisions taken for measures of stowage and securing cargo should be based on the most severe weather conditions which may be expected by experience for the intended voyage. (Interestingly, the Code does not refer to stevedores who are known to ignore the loading plan as earlier described).

Regarding the first principle above: if the shore planners had sound practical knowledge of the application and content of the CSM, and if they had always acted with such knowledge, the loading plans would have always complied with the CSM and fail-safe mechanisms would probably not be necessary. Concerning the second principle: if the vessel had a safe and proper container securing system, then, there would be no container stack collapses when a vessel encountered heavy or severe weather conditions during the voyage.

In any proceeding against a shipowner following container stack collapses, a court could also decide that the shipowner had failed the prudent owner test, articulated by T Carver in Carver's Carriage by Sea, and quoted with approval by Channell J, in McFadden v Blue Star Line [1905] 1 KB 697, at 706:

A vessel must have that degree of fitness which an ordinary careful and prudent owner would require his vessel to have at the commencement of her voyage having regard to all the probable circumstances of it…Would a prudent owner have required that it (i.e. the defect) should be made good before sending his ship to sea, had he known of it? If he would, the ship was not seaworthy…

The critical factor against the shipowner would be their prior knowledge of the two known defects before and at the commencement of the voyage. The shipowner would probably raise the defence of industry practice in terms of (i) the loading plan being prepared by shore planners for the majority, if not all shipowners; and (ii) the existing container securing system being used by all shipowners.

Courts have been known to disregard industry practices, holding that courts are the ultimate arbiters of what is required by the law. In the US case The TJ HOOPER 60 F. 2d 737 (1932), the court was required to consider whether the owner of tugs towing coal-laden barges, should have provided radio receiving sets to the tugs' masters that would have provided early warning of a storm, enabling them to seek shelter and prevent the eventual sinking of both barges. The tug owner followed industry practice that did not require owners to supply radio sets to their tugs; and the law did not mandate such supply. Justice Learned Hand (one of the smartest judges not to sit on the US Supreme Court) delivered judgement for his two fellow judges and rejected this industry practice:

They can have at hand protection against dangers of which they can learn in no other way. Is it then a final answer that the business had not yet generally adopted receiving sets? There are, no doubt, cases where courts seem to make the general practice of the calling the standard of proper diligence; we have indeed given some currency to the notion ourselves. … Indeed in most cases reasonable prudence is in fact common prudence; but strictly it is never its measure; a whole calling may have unduly lagged in the adoption of new and available devices. It never may set its own tests, however persuasive be its usages. Courts must in the end say what is required; there are precautions so imperative that even their universal disregard will not excuse their omission.

The High Court of Australia, in Rogers v Whitaker [1992] HCA 85, delivered a joint judgment by five of the six judges, with the sixth judge delivering a separate but concurring judgment. The court had to consider whether the ophthalmologist, Dr Rogers, before operating on Mrs Whitaker's right eye, ought to have informed her that she could develop sympathetic ophthalmia in her good left eye post operation, resulting in the loss of sight in that eye; and obtained her informed consent (to the operation). He did not so inform her and, post-operation, she lost her sight in her previously good left eye. Dr Rogers relied upon the Bolam principle as his defence in not so advising her:

"The Bolam principle may be formulated as a rule that a doctor is not negligent if he acts in accordance with a practice accepted at the time as proper by a responsible body of medical opinion even though other doctors adopt a different practice. In short, the law imposes the duty of care: but the standard of care is a matter of medical judgment." [7]

Put simply, the principle is: if a doctor follows a practice that is accepted as proper by a responsible body of medical opinion, then, even if the practice results in injury to a patient, the doctor cannot be considered to have been negligent. The Court referred with approval to the decision of King J, regarding a woman who became pregnant after a failed tubal ligation (F v. R. ((26) (1983) 33 SASR 189, 194):

The ultimate question, however, is not whether the defendant's conduct accords with the practices of his profession or some part of it, but whether it conforms to the standard of reasonable care demanded by the law. That is a question for the court and the duty of deciding it cannot be delegated to any profession or group in the community.

In rejecting Dr Rogers' defence (that his failure to advise Mrs Whitaker was consistent with the standard practice of his profession), the Court relied upon King J's remarks in F v R viz that it was for the court to decide whether the conduct conformed to the standard of reasonable care demanded by the law; such standard was not the duty of a profession or group in the community.

Returning now to the shipowner whose vessel commenced its voyage with the two known defects, resulting in container stack collapses during heavy weather, a court in 2022, could expect the shipowner to have

rectified the two known defects years ago. Failure to have rectified the defects could prompt the court to conclude that the shipowner had displayed a cavalier attitude towards cargo/container safety, treating container losses as inevitable and an inherent cost of operating vessels – a notion with which many would agree.

With containers falling overboard, governments could turn their attention to unseaworthy vessels. The Australian Navigation Act 2012 ss.109 and 110 creates offences for shipowners and masters respectively, for sending/taking unseaworthy vessels to sea. Fault-based offences, max 10 years; civil penalty, max 6000 penalty units (A$222/unit).

Turning now to the rectification cost of the two known defects, this cost can only be considered by default, because there is no comparable research available as a guide. From a cost/benefit aspect, the rectification cost could be compared against the costs involved in container stack collapses and container retrieval from coastal waters. The cost of the former would run into the hundreds of millions of US dollars, involving, inter alia: cargo; containers; discharge/reload operations; extended port stays; intermediate ports; delayed schedules; restoration of coastal works and tourist beaches; and container recovery from coastal waters. Such exorbitant costs could not reasonably be used as a guide. Turning to container retrieval costs from Australian coastal waters, the Australian Maritime Safety Authority was reimbursed about A$18M (US$13M – YM Efficiency) and about A$22M (US$16M – APL England). Using the lower US$13M cost as a guide, a reasonable person would agree that the rectification cost would be a fraction of US$13M. But here's the conundrum: on the one hand, shipowners appear to be content to incur costs associated with container stack collapses since around 2011; but on the other hand, in their Grounds for Application to Intervene in the matter of the CMA CGM Libra, the International Group of P&I Clubs noted that, since the Admiralty Court decision regarding that vessel in March 2019, claims received by shipowners concerning passage planning were estimated at US$116M:

26. These are matters of real financial importance. It is estimated that the total value of claims concerning passage planning that have been received by member clubs since the decision of the Admiralty Court in this case is in excess of USD 116 million.

The comments below put the issue with passage plans into perspective:

i. When the CMA CGM Libra grounded in May 2011, P&I Clubs should have advised their ship-owning members about the circumstances of the grounding and the need for passage plans to be compliant with the Guidelines for Voyage Planning, before and at the commencement of voyages; shipowners, since 2011, should have required their DPAs to ensure that passage plans were compliant, given the easy availability of electronic charts and nautical publications;

ii. The Admiralty Court's decision was delivered in March 2019, almost eight years after the grounding; if shipowners had followed the advice in (i) above, all passage plans should have been compliant at the commencement of the voyages since 2011.

So, what we have here, is this: shipowners continue to operate their vessels with two known defects, despite having incurred losses in the hundreds of millions of US dollars, since 2011-2012. Their apparent willingness to accept such losses is at odds with their concerns around claims associated with passage planning. Had shipowners conducted risk assessments of their operations in 2011-2012, it would have demonstrated the need for urgent action to eliminate container stack collapses and avoid the resulting losses. Their failure to rectify the two known defects and prevent the ensuing losses, lends credence to the 'notion' that shipowners treat certain losses (or costs), as inherent to operating a vessel. Shipowners could discredit that notion by commencing research to rectify the defects that would eliminate container stack collapses, enhance safety at sea; prevent the risk of crew injury and reduce the burden of container losses on the consumer.

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First electric 'flying' ferry set to take Stockholm's waterborne public transport by storm

The world's fastest electric ship, the Candela P-12 Shuttle, is set to hit Stockholm's waters next year, heralding a new era of transport. The innovative hydrofoiling electric ferry will reduce emissions and slash commuting times – and the city believes it will make waterborne public transport more attractive than trains, buses, and cars.

The marine technology company Candela released the first pictures of what will be the world's fastest, longest-range and most energy efficient electric ship ever. The Candela P-12 Shuttle, as the innovative vessel is called, will be shuttling citizens between the sprawling Stockholm suburb of Ekerö and the city center in the coming year. Flying across the water, the 30-passenger electric vessel has a speed of 30 knots – considerably faster than any other electric ship in the world. It also provides faster commuting than the subway and bus lines it competes with, as well as being infinitely more energy efficient than the diesel vessels currently servicing the same route. Perhaps most signficant, the ship is faster than travelling by car during rush hour.

The secret to its high speed and long range are the three carbon fiber wings that extend from under the hull. These active hydrofoils allow the ship to lift itself above the water, thus decreasing drag.

500% MORE EFFICIENT SHIPS

Candela's technology reduces energy per passenger kilometer by 95% compared to current vessels, allowing for an unprecedented range of 50 nautical miles at service speed. Using the equivalent of 0.1 kWh of electricity per passenger kilometer, the ship is more energy efficient than a hybrid electric bus. Also, with up to 200 kW DC charging, it can charge its battery in under one hour.

Most importantly, the razor-sharp carbon fiber foils will slash many commuters' travel times in half.

With the ability to cover even the longest routes in Stockholm at high speeds, the Candela P-12 Shuttle will be used by the to shorten the commute between the rapidly expanding Stockholm suburb of Ekerö and the city center. Currently a 55-minute trip by bus, subway, or conventional ferry (or even car during rush hour), the Candela P-12 Shuttle will cover the 15 km route in only 25 minutes – saving the commuter an average 50 minutes per day.

"This will have a huge positive impact on people's lives – you can work one more hour or pick up your kids from school one hour earlier," says Erik Eklund.

As the hydrofoiling Candela P-12 Shuttle creates near zero wake, it has been granted an exemption from the 12-knot speed limit, allowing it to fly into the city center without causing wave damage to other vessels or sensitive shorelines. In fact, the miniscule propeller wash is considerably smaller than the wake from conventional passenger ships travelling at slow speeds.

ENDING SEA SICKNESS

The first electric flying ferry will also elevate passenger experience to an entirely new level, thanks to the most advanced computer system found in a passenger boat. Those

prone to seasickness will appreciate the extremely smooth ride in adverse weather. Flying silently above the waves, the Candela Flight Controller – a computer which regulates the hydrofoils 100 times per second – ensures a steady, smooth ride over waves that would make many feel queasy.

"There's no other ship that has this kind of active electronic stabilization. Flying aboard the P-12 Shuttle in rough seas will feel more like being on a modern express train than on a boat: it's quiet, smooth and stable," says Erik Eklund, Vice President, Commercial Vessels at Candela.

The Region of Stockholm will operate the first P-12 Shuttle ship for a nine-month trial period during 2023. If it meets the high expectations placed on it, the hope is that the city's fleet of over 70 diesel vessels eventually will be replaced by P-12 Shuttles – but also that land transport from congested highways can shift to the waterways.

"Maritime traffic is the region's most popular public transport, and I want to expand it. But we need better technology to travel faster and reduce climate impact. Therefore, we are happy to try this new technology for waterborne traffic. This project can contribute to solutions that we can use in Stockholm, but also provides opportunities for both exports and jobs in the Stockholm region," says Gustav Hemming, Vice President of the Regional Executive Board in Stockholm.

A COMEBACK FOR WATERBORNE TRANSPORT

Ever since faster and cheaper steam trains started to replace expensive and slow coal-fired packet boats in the 1850's, urban transport has come to rely on land-based vehicles – even in cities like Stockholm, San Francisco, and New York, where the waterways offer natural cross connections between regions and boroughs.

With Candela's P-12 Shuttle, the current status quo will once again be challenged. In rush hour traffic, the ship is faster than buses and cars on many routes. Thanks to the hydrofoil's efficiency, it can compete on mileage costs too; and unlike new subway lines or highways, the flying electric super-ship can be inserted on new routes without massive infrastructure investments – all that is needed is a dock and electric power.

The P-12 Shuttle's handy size – with a comfortable and airy cabin for 30 seated passengers – adds to its versatility. In Stockholm, passenger vessels have a 17% occupancy rate on average, meaning that a 300-passenger ship carries only about 50 people on most days.

Candela's vision is to replace today's large, predominantly diesel, ships with nimble fleets of faster and smaller P-12 Shuttles, allowing for more frequent departures and more passengers carried, at a lower cost for the operator. On the Stockholm-Ekerö route, Candela's proposal is to replace the current pair of 200-person diesel vessels with at least five P-12 Shuttles, which would double passenger volume potential and lower operating cost.

"Instead of two departures per day, there would be a P-12 Shuttle departing every 11 minutes. This allows commuters to ignore timetables and just go to the dock and wait for the next boat," says Erik Eklund.

MASS PRODUCTION FOR MASS TRANSIT

Candela will be laying the carbon fiber keel for the very first Candela P-12 Shuttle at the company's new, automated factory in Rotebro, outside Stockholm, towards the end of 2022. After initial tests, the first commuters in Stockholm will embark on the 40-foot vessel in 2023.

The first P-12 Shuttle will be followed by many more, as serial production ramps up at the company's Rotebro factory. Using production methods already streamlined for Candela's leisure boat manufacturing, Candela aims to eventually spit out hundreds of P-12 Shuttles a year. The company sees a huge demand from over 600 cities, municipalities, vessel operators and urban developers that already have expressed interest in the P-12 Shuttle as a faster, cheaper, and green alternative to existing diesel ships or land transport.

SPECIFICATIONS

Length:	11.99 meters
Beam:	4.5 meters
Weight:	8.5 tonnes
Capacity:	30 passengers seated
Motor:	2 x Candela C-POD
Batteries:	180 kWh
Charging:	up to 200 kW DC
Top speed:	30 knots
Service speed:	25-27 knots
Range:	40-60 nautical miles at 25 knots service speed

What changes to SOLAS 2024?

A set of amendments to the International Convention for the Safety of Life at Sea (SOLAS) and the associated Codes enter into force on 1 January 2024. This statutory news from DNV highlights the changes that have been adopted for the 2024 update of SOLAS and its associated Codes.

The SOLAS Convention is regarded as the most important of all international treaties concerning the safety of merchant ships. Amendments to the technical provisions generally follow a four-year cycle of entry into force. This news highlights amendments related to:

- Safe mooring operations
- Modernization of the GMDSS
- Watertight integrity
- Watertight doors on cargo ships
- Fault-isolation of fire detection systems
- Life-saving appliances
- Safety of ships using LNG as fuel

Safe mooring operations

New SOLAS requirements intend to improve mooring safety by introducing additional requirements to selection, arrangement, inspection, maintenance and replacement of mooring equipment, including lines. Documentation regarding the design of mooring arrangements and the selection of mooring equipment will be required to be provided and kept on board.

The new requirements are incorporated in SOLAS Regulation II-1/3-8 on towing and mooring equipment, and supported by the following guidelines:

- "Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring" (MSC.1/Circ. 1619)
- "Guidelines for inspection and maintenance of mooring equipment including lines" (MSC.1/Circ.1620)
- "Revised guidance on shipboard towing and mooring equipment" (MSC.1/Circ. 1175/Rev.1).

The design requirements will apply to new cargo and passenger ships constructed on or after 1 January 2024 that are above 3000 GT, and should also apply to ships of 3000 GT and below as far as reasonably practicable. The maintenance and inspection requirements will be applied retroactively for all ships.

Modernization of the Global Maritime Distress and Safety System

The requirements to the Global Maritime Distress and Safety System (GMDSS) have been modernized to contain more generic requirements, independent of specific service providers, and to remove carriage requirements for obsolete systems. Furthermore, the requirements for communication equipment have been moved from SOLAS Chapter III on life-saving appliances to Chapter IV on radio communications. The definitions of the sea areas A1 to A4 have been amended to reflect that the geographical area of coverage may vary between various satellite service providers.

Since the IMO adopted the worldwide system for communication of emergency information in 1988, Inmarsat has been the only approved provider of satellite communication services for the GMDSS. In 2018, the IMO also recognized Iridium as a provider of such services, and the 2020 update of SOLAS replaced provider-specific terms with the more generic "recognized mobile satellite service".

Consequential amendments have been made to the 1994 and 2000 High-Speed Craft (HSC) Codes, the Special Purpose Ships (SPS) Code and the Mobile Offshore Drilling Units (MODU) Code.

The amendments will enter into force on 1 January 2024. Existing SOLAS certificates do not have to be reissued before they expire as a consequence of the reorganization of SOLAS Chapters III and IV.

Watertight integrity

Amendments to SOLAS Chapter II-1 will ensure that the requirements to watertight integrity in parts B-2 to B-4 capture the probabilistic damage stability approach in parts B and B-1. The amendments address inter alia assumptions regarding progressive flooding, valves in the collision bulkhead and the consideration of watertight doors.

The amendments are a result of experience with the revised SOLAS Chapter II-1 after the probabilistic damage stability approach was introduced in the 2009 update of SOLAS. The approach assesses the probability of survival for a ship in case of damage, related to the extent and location of the damage. The probabilistic approach is perceived to give a more realistic representation of the condition of a ship in damaged situations, and to allow more freedom regarding, for example, the placement of watertight bulkheads.

The amendments will apply to new cargo and passenger ships constructed on or after 1 January 2024 and will not have any impact on existing ships.

Watertight doors on cargo ships

The requirements to watertight doors in MARPOL Annex I, the Load Lines Convention, the IBC Code and the IGC Code have been amended to harmonize the consideration of watertight doors in damage stability calculations with the same in SOLAS. The inconsistencies were related to the type of watertight doors (sliding, hinged), to the technical/operational requirements and to the terminology for the frequency of use of watertight doors.

The amendments to the Load Lines Convention and the IBC Code will enter into force on 1 January 2024, and the amendments to MARPOL Annex I and the IGC Code will enter into force on 1 July 2024. The amendments will apply to cargo ships and will not have any impact on existing ships.

Fault isolation of fire detection systems

The requirements for fire detection systems have been adjusted so that short circuit isolators do not need to be provided at each individually identifiable fire detector for cargo ships and passenger ship balconies. For cargo ships, one short circuit isolator per deck will typically be acceptable.

The amendments to Chapter 9 of the Fire Safety Systems (FSS) Code will enter into force on 1 January 2024.

Life-saving appliances

Various adjustments have been made to SOLAS Chapter III and the associated Life-Saving Appliances (LSA) Code:

- The launching appliance of new rescue boats less than 700 kg does not need to have stored mechanical power, but handling shall be possible by one person.
- Free-fall lifeboats will not need to be launch-tested with the ship making headway at speeds of up to 5 knots in calm water, as there are no additional dynamic loads on the launching arrangements.
- Lifeboats equipped with two independent propulsions systems do not need to be equipped with buoyant oars.

The amendments will apply to cargo and passenger ships and enter into force on 1 January 2024. Flag states are invited to voluntarily apply the launch test provisions for free-fall lifeboats earlier.

Ships using LNG as fuel

The International Code for Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code) has been amended to reflect experiences gained since the code entered into force in 2017. The main amendments address:

- Cofferdams for fire protection purposes (Chapter 6.7)
- Safe fuel distribution outside machinery spaces (Chapter 9)
- Fire protection between spaces with fuel containment systems (Chapter 11)
- Fixed fire-extinguishing systems in LNG fuel preparation spaces (Chapter 11)

The amendments will apply to new ships using natural gas as fuel and will enter into force on 1 January 2024.

Towards SOLAS 2026

The 105th session of the IMO's Maritime Safety Committee in April 2022 was the last session to adopt amendments to the 2024 update of SOLAS and the related mandatory codes. Amendments adopted less than 18 months before 1 January 2024 would normally be pushed to the next four-year cycle of entry into force.

The IMO has, however, recognized that the COVID-19 situation have caused delays in some ongoing work and has hence introduced an ad hoc mid-term amendments cycle. The next update of SOLAS will therefore enter into force on 1 January 2026 and will include amendments adopted before 1 July 2024.

2024
2026

The Surveyor's Bag

by Mike Wall BSc, MSc, FIMarEST, FRINA, CEng, QDR

Some surveyors use a backpack, some a holdall, some a document case with wheels, I've even seen just a plastic bag, but they all have the same thing in common. They must be like Doctor Who's proverbial Tardis, i.e., externally small and compact but internally voluminous to take the plethora of equipment required to do the job.

First to be packed is the boiler suit or overalls, together with the working shoes or boots. The former can range from a sparkling new white boiler suit to a tatty stained and torn shadow of its former self. (The more experienced surveyor prefers the latter so as not to look like a beginner.) The latter can range from a pair of trainers to steel capped leather boots.

As some may not choose to launder their boiler suit on a regular basis with the boots rarely disinfected, it is advisable to stand well clear with no naked lights when a surveyor is opening his bag back at base.

After the above two essentials, comes the flashlight. Some surveyors clearly trying to prove something with a phallic multiple cell torch, others being more modest with a smaller, but just as powerful, single cell AA LED model. Whichever is used, it will need to have batteries that last forever, be watertight, intrinsically safe and sturdy enough to survive being regularly dropped from great heights.

Then we have the compulsory notebook, pen and often a file containing case documents. The notebook is usually of A6 size, ie, small enough to fit into the boiler suit breast pocket, but large enough to contain what pretends to be authoritative scribbling. Since this book may, on occasion, be a legal document, many surveyors have taken a leaf out of the lawyers' book, writing illegibly and in gobbledygook so that nobody can understand or interpret the hieroglyphics. In this way the surveyor avoids any legal consequences. The pen, of course, must last forever without any refills and again must be sturdy enough to suffer the same fate as the flashlight.

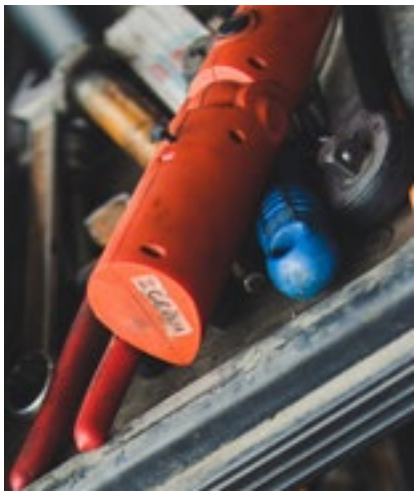
A camera is again obligatory with weight being saved by use of a digital camera or nowadays, a smartphone. However, the macho surveyor must have the largest camera possible with a super zoom lens, whilst the more modest members of our profession have learned to keep it small and compact to save space and weight. The old comparison with the number of sparrows and "I'm not bragging but…" comes to mind here.

Nowadays, many surveyors carry a laptop computer so that they can reduce downtime and start the report on site. These again can range in size, complexity and weight but these are now available in smaller and lighter sizes for those who travel often. Unfortunately, the digital camera, possible rechargeable flashlight and computer need regular recharging and thus many cables and adapters must be carried. Some will carry spare batteries for battery operated equipment. The copper wire in the cables and batteries are in fact what add most of the weight to the bag. As batteries can be purchased anywhere, these could be omitted. A simple test of equipment before leaving base or the hotel room will reveal if replacements are needed.

Working gloves are an essential. Hard leather gloves are inconvenient in that they do not allow the surveyor to write notes with a pen or pencil. The soft cotton gloves with rubber pimples are far more convenient and hard wearing for climbing steel ladders. Soft Japanese chamois leather gloves are by far the best but expensive and often difficult to find.

Many surveyors like to carry emergency supplies around with them in the form of bandaids, aspirin, cough drops, imodium, etc, for the oft-time self inflicted pain. Some used to carry a Swiss army knife which came in handy on many occasions, sometimes, but rarely, for terminating the self-inflicted pain! However, due to security procedures, this and many other useful tools may not now be carried in hand baggage on flights.

Apart from the above standard items, the surveyor may be required to carry ultrasonic thickness testing equipment, ultrasound hatchcover testing equipment, specialised



thermometers, moisture content meters, tape measures, rulers, paint thickness gauging equipment, gas and oxygen detectors, together with a hard hat, although most of the aforementioned may not need to be carried simultaneously.

The bag should also have space for the traveler's wallet, containing passport, tickets, foreign currency, credit cards, loyalty program cards, etc. The bag should therefore have the ability to be locked for security purposes.

As a consequence of its weight the straps will need to look trendy but be comprised of high tensile steel braiding. As it is likely to be heavy, wheels are an advantage to save the vertibrae in your spine!

Lastly, it should be light enough to be carried long distances and small enough to be stowed in the hand baggage compartment above the aircraft seats to allow a rapid exit from the airport.

How Independent Are You?

Bond Solon trainer and subject matter expert, Nick Deal reviews the background of Tylicki v Gibbons [2021] EWHC 3470 (QB) case and the salient points.

The first instance judgment in Tylicki v Gibbons [2021] EWHC 3470 (QB) provides invaluable commentary on this issue, noting that experts should be wary of sympathising with their instructing party and should not produce a report that has been influenced by instructing solicitors. It also highlights how judges may assess these issues and how experts might be challenged in court.

Background

The claim arose out of an incident during a race at Kempton in the 3.20 Mile Maiden on 31st October 2016. There was a collision between Graham Gibbons and Frederick Tylicki, both experienced professional flat race jockeys. The collision caused Mr. Tylicki's mount to fall, resulting in Mr. Tylicki sustaining T4 AIS complete paraplegia.

Mr. Tylicki alleged that Mr. Gibbons had ridden in a way that fell below the standard of care that was expected of him.

In support of his claim, Mr. Tylicki called Mr. Ryan Moore as an expert witness on the issue of professional flat race riding. There was no doubting his subject matter expertise. Her Honour Judge Karen Walden-Smith described him as having ridden in "tens of thousands" of races and having won more than 2,500 of them.

Why, then, was he subjected to "sustained criticism" by Mr. Gibbons' barrister?

There were two broad criticisms:

- Firstly, that he was too sympathetic to Mr. Tylicki to be a truly independent expert witness.
- Secondly, the manner in which his report came to be drafted.

Either of these criticisms, had they stuck, would be likely to have led to the judge disregarding, or at least placing less weight, on his evidence.

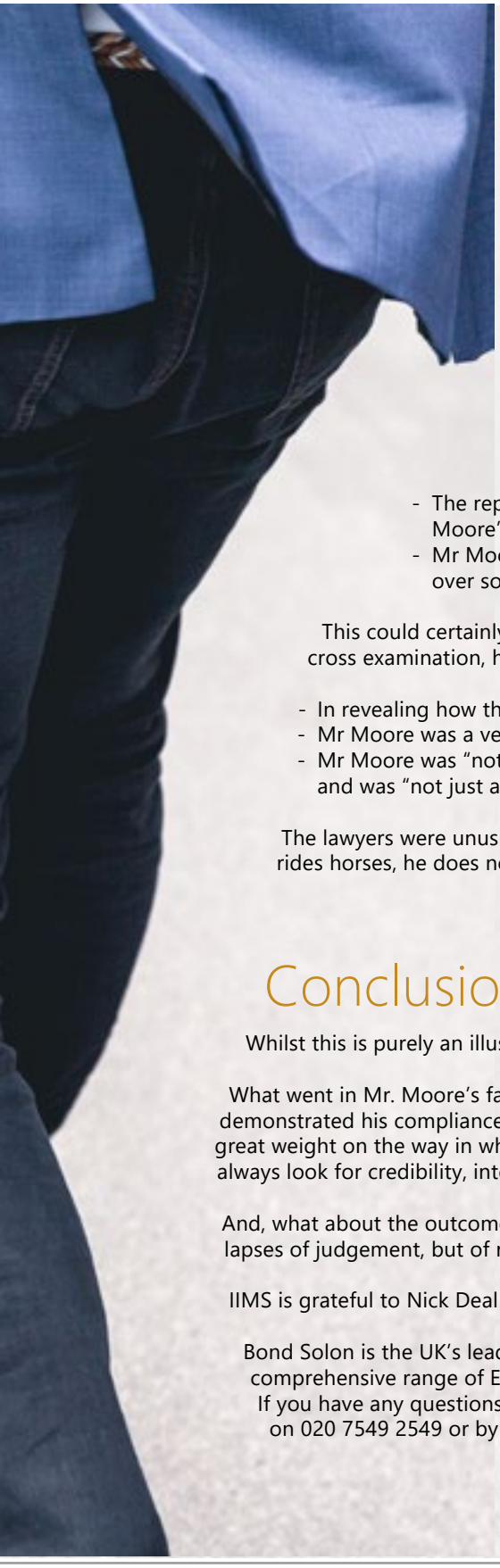
The sympathy issue

Mr. Moore was approached directly by Mr. Tylicki to give expert evidence. He was cross examined about his sympathies for the claimant and expressed a great deal of sympathy for him - and also for Mr. Gibbons. Mr Moore stated that it was a "horrible situation" and that he was trying to write a report that was fair.

The judge's assessment was that Mr Moore was "an extremely straightforward witness who was using his expertise in order to assist the court''.

She expressed complete confidence that he was trying to provide a fair report. This was based on his experience and on the evidence in the case. And found nothing in his evidence, or his delivery of it, to support this criticism.

If you give, or are asked to provide expert witness in court, this case - totally unrelated to the marine sector - will make you think carefully about your role and how you approach your report.



The report

There was criticism, too, about the way in which Mr Moore's report was drafted.

This was triggered by his open admission in the report that it been made "from notes made by the lawyers [for the claimant] from what I have told them at face-to-face meetings with them and in telephone calls". It was, therefore, unclear as to whether the report was actually Mr. Moore's opinion or the lawyers'.

The judge ordered disclosure of the notes referred to in the report. Mr. Moore was cross examined in depth about his report and the following emerged:

- The report was drafted, amended and redrafted by the lawyers (albeit subject to Mr. Moore's review).
- Mr Moore was asked questions by his lawyers in telephone calls and face-to-face meetings, over some months.

This could certainly look bad, both for the expert and for the lawyers. Having heard his evidence under cross examination, however, the judge concluded that:

- In revealing how the report came into being, Mr. Moore was being commendably candid with the court.
- Mr Moore was a very careful witness, who made concessions "where appropriate".
- Mr Moore was "not someone who would put his name to a document that did not contain his views" and was "not just a conduit for the views of others".

The lawyers were unusually involved for practical reasons. She noted that "Mr. Moore told the court, he rides horses, he does not sit at a computer".

Conclusion

Whilst this is purely an illustrative judgment (not an authority), experts would be well advised to take note.

What went in Mr. Moore's favour were his transparency and his adherence to the evidence. Together, they demonstrated his compliance with his overriding duty to the court in a very difficult and tragic case. Judges place great weight on the way in which witnesses give their evidence. They assess the witness in front of them and always look for credibility, integrity, and straightforward helpfulness.

And, what about the outcome of the case? Well, the judge found in favour Mr Tylicki. This was not a case of mere lapses of judgement, but of reckless disregard for his safety.

IIMS is grateful to Nick Deal who authored this article, which was originally published on the Bond Solon website.

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Lithium-ion batteries... should we be concerned?

An opinion article by Mike Schwarz, IIMS Chief Executive Officer.

I have written this short article following the publication of a report into a lithium-ion battery-related fire onboard the 'MS Brim' which generated the investigation by the Norwegian Safety Investigation Authority. The vessel in question is the 'MS Brim', a 2019-built all-electric catamaran offering excursion tours in the Norwegian fjords. Although not a technical man, I am troubled by some of the report findings, and forgive me as I have cherry-picked the bits that concern me most from a lengthy report.

So, I pen this article in my simplistic way as a) just a concerned and interested member of the general public and b) in my role as Chief Executive Officer of the International Institute of Marine Surveying on behalf of the surveying community.

Lithium-ion batteries are not brand new, but the technology is becoming far more widely used in vessels as the world looks to decarbonize and cut emissions. The purpose of this article is not to be negative and closed to new technology, but rather to express my concerns based on what I have read with regards to this incident in particular and the safety culture around this means of propulsion. At 81 pages, the report is detailed, but I would encourage you to download it at **https://bit.ly/3bdy5vi**.

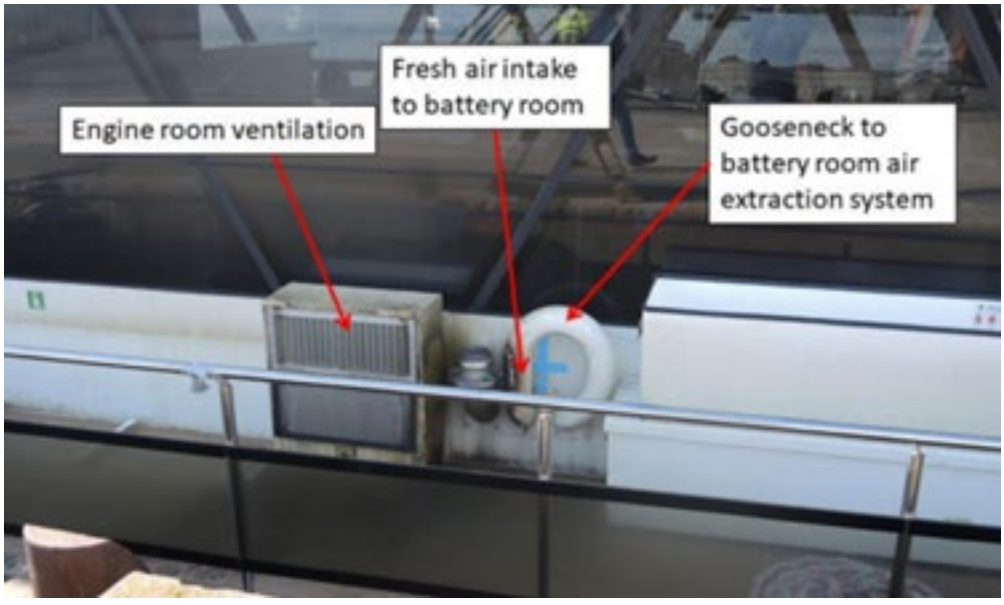
Let me take some words directly from the report itself: 'Immediately before the fire broke out, the battery system was disconnected as a result of a ground fault, which was indicated on the panel on the bridge. Ground faults had been a recurring problem since the vessel was new. The crew, therefore, perceived the alarm as 'one of many'.

In the interests of public and crew safety, I ask why this was thought to be acceptable and why no-one reported or did anything about a recurring problem?

BACK TO THE REPORT:

'There was no camera surveillance of the battery room. The presence of a camera might have helped the crew to dispel the incorrect perception that it was the engine room that was on fire. The DNV's updated classification rules from 2021 recommend camera surveillance of battery rooms to improve the crew's situational awareness, in addition to gas monitoring for early detection of gases before they develop into smoke'.

I leave you to draw your own conclusions on this paragraph.



Ventilation for engine room and battery room on starboard side of 'Brim'. Photo: NSIA

And here is another statement from the report that caused me to raise my eyebrows:

'The investigation has also identified several areas where the risks associated with the use of lithium-ion batteries were not sufficiently identified or addressed in the design. At present, DNV's classification rules for battery safety do not sufficiently address the risks associated with the use of lithium-ion batteries on board vessels'.

Clearly there is the suggestion that the vessel design is at fault. Will appropriate modifications be made to ensure this issue is addressed? As a potential traveller to the Norwegian fjords sometime soon, I do hope so! Mention in the report that a classification society's rules have yet to catch up with the technology does nothing to boost my waning confidence either. As so often seems to be the case in the marine world, it appears that technology is running faster than the rule makers or maritime regulators can keep up with. I wonder how differently things might work in the aircraft business. It seems incongruous that it would be acceptable for a few of the new breed of lithium-ion powered aircraft that will surely be in the skies soon should catch fire and crash. So, what is the aircraft industry doing differently and what could the maritime sector learn?

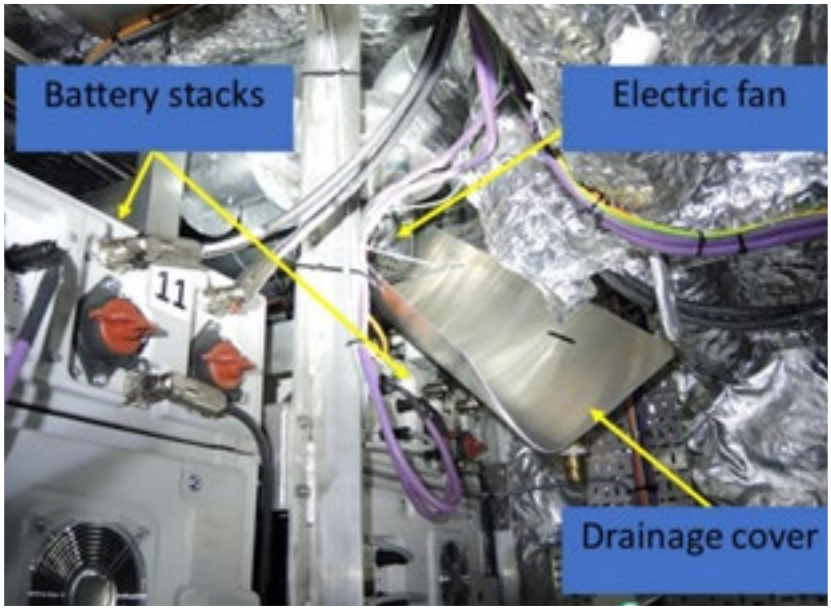
And now, to conclude, here are the safety recommendations extracted from the report: The Norwegian Safety Investigation Authority recommends...

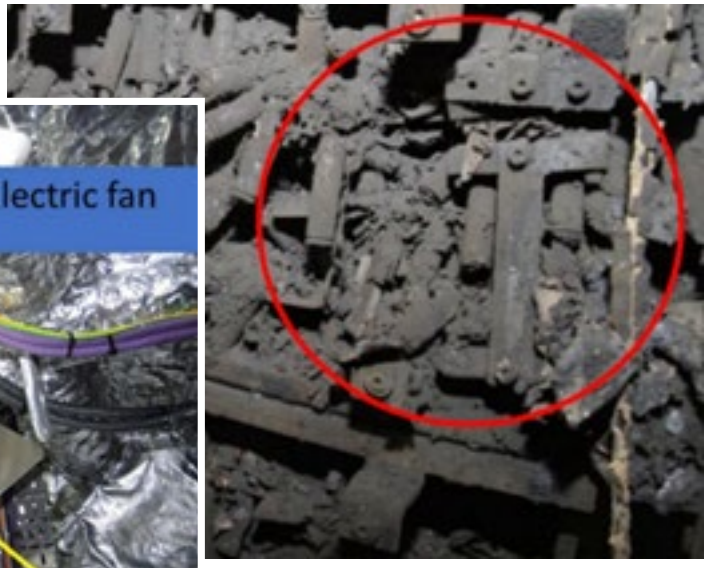
- *that the Norwegian Maritime Authority issues requirements for appropriate test methods that reflect the risks associated with the design of different battery types to be chosen for conducting propagation tests.*
- *that the Norwegian Maritime Authority ensures that battery safety regulations be developed so that ventilation arrangements do not contribute to batteries and high-voltage components being exposed to humid sea air or seawater.*
- *that the Norwegian Maritime Authority introduces additional measures to verify that installations are smokeproof and ensure fire integrity.*
- *that the Norwegian Maritime Authority issues requirements for risk assessments relating to the use of lithium-ion batteries, and that they should contain all relevant risks identified by different disciplines, the sum of which represents the vessel's fire risk.*
- *that the Norwegian Maritime Authority, as the administrative authority, cooperates with the Directorate for Civil Protection on stipulating a requirement that all Norwegian vessels, regardless of classification, must be built to a defined standard that ensures battery safety.*
- *that the Norwegian Maritime Authority introduces compensatory measures to address the safety of passengers and crew in the event of a lithium-ion battery fire.*
- *that the Directorate for Civil Protection strengthens the knowledge and expertise of the parties involved in the first-line response to accidents involving a fire on board a vessel carrying lithium-ion batteries.*

Gosh, that's a lot of safety recommendations, but read them carefully and re-read them to understand exactly what is being recommended. There is a huge onus being placed on the Norwegian Maritime Authority to react and presumably, this same pressure applies to other maritime regulators around the world.

So, there you have it. All I want to know is that when I get onboard such a vessel as a paying passenger, I am reasonably safe! And in my professional role, I want marine surveyors to be aware of some of the new challenges that await them today and in the near future surrounding lithium-ion battery technology and vessel design. I would like to encourage a debate around this topic, but if nothing else, I wanted to alert people to the situation.

Electric fan above battery stack 12 with temporary drainage cover installed in port battery room to lead water away from the battery system. Photo: NSIA





Remnants of battery module 2 in battery stack 6, with the copper strip encircled in red. Photo: Kripos

Mike Schwarz

Sanctioned countries, persons and activities

Why you need to know about these regulations

By Karen Brain

Q. Do you know who you are dealing with? Q. Who is your client?

The client or entity at the end of a chain are often colloquially known as the "touch point". It does not matter how many agents or entities are between you and the "touch point". It is the "touch point" that is important if there are sanctions applicable to that "touch point". It is vital that you check and know who/what is the end point of any chain of business and you need to be aware of potential sanctions for countries, persons and activities as there are penalties for breaching the sanction regulations that can be quite harsh. Also, do check where and from whom or what entity money is being paid to you as there may be trading sanctions.

The UK government publishes the UK Sanctions List, which provides details of those designated under regulations made under the Sanctions Act. For details go to **https://bit.ly/3bT0wib**.

The publications detail which sanctions measures apply, and these can be to the persons or ships, and in the case of UK designations, it provides a statement of reasons for the designation. HM Treasury's Office for Financial Sanctions Implementation provides a consolidated list of persons and organisations under financial sanctions, including those under the Sanctions Act and other UK legislation.

The countries that the UK have placed on sanction are relevant to your insurance cover.
The territorial limits of insurers are usually written as follows:

Example:

"... excluding any accident, situation or suit arising from Iran, Iraq, Yemen, Afghanistan, Pakistan, Somalia, Sudan, Syria, Belarus, Russia or North Korea".

So, if for example you were sued in another country that did not have sanctions against Russia by a Russian, in the above example your insurance would exclude cover by virtue of the Territorial Limits Section and, also, it would have to because of UK regulations. This would mean that your insurers would not and could not pay a judgement against you.

Also, be aware that Courts in England and Wales must follow sanction regulations and so you may find yourself at a financial loss on a transaction if sanctions apply, irrespective of any possible penalty that could be applied.

A final note:

Be aware of the sanction regulations and always know who or what entity is/are really your client(s) i.e. the "touch point"!

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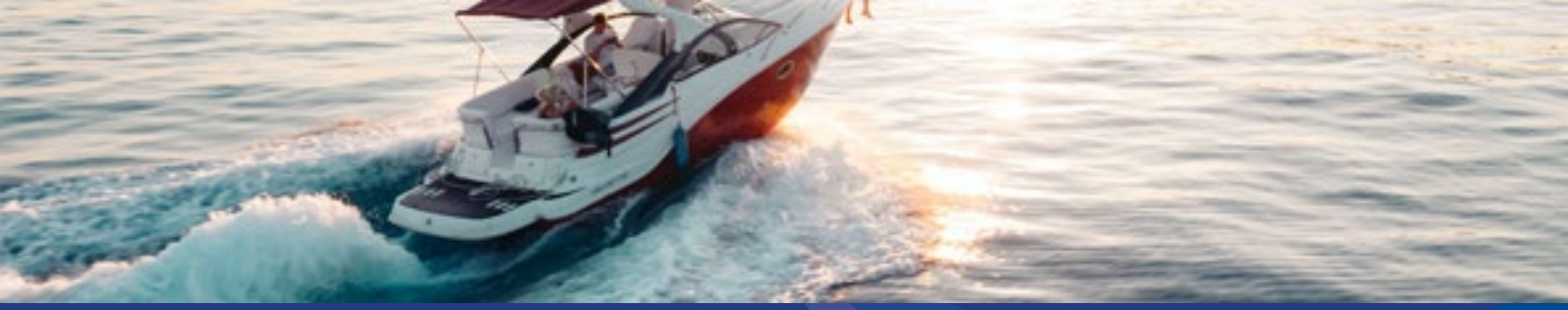


MCIB
Marine Casualty Investigation Board
Bord Imscrúdú Taismí Muirí

Marine Casualty Investigation Board (MCIB) call for applications for appointment as an **Expert Marine Consultant**

The MCIB of Ireland invites applications from suitably qualified marine consultants to enhance the technical skills within the MCIB Secretariat, support investigations and investigators, and provide technical advice to the Board as required.

As an Expert Marine Consultant to the Board, you will be required to:

- Provide expert technical advice to the Board on a broad range of diverse Marine Casualties.
- Co-ordinate a panel of investigators ensuring that marine casualties are investigated in accordance with the relevant legislation.
- Monitor and ensure that all incident investigations are conducted thoroughly and effectively and that they meet the requirements and expectations of the Board and are in accordance with national and international regulations.
- Act as investigator under warrant from time to time as appointed by the Board.
- Carry out other investigator type functions as may be determined by the MCIB from time to time including acting as a support or providing assistance to the investigator appointed under warrant, and/or co-operating on another investigation or report.
- Liaise with the Board and the Secretariat regarding investigation progress and presentation of reports in the required format.
- Take part in activities arising from the MCIB's membership of the European Union's European Maritime Safety Agency ("EMSA"). This will include taking part in EMSA training and also any audits or assessments carried out by the EU/EMSA or IMO as required.
- Take part in MCIB training and in general activities arising from the MCIB's own audit or governance activities.
- Contribute to the work of the MCIB in engagement with other entities interested in marine safety and other entities.
- Any other duties and responsibilities deemed necessary by the Board.

The closing date for applications is 20th September 2022 at 16.00 hrs.

To make an online application, please go to **https://bit.ly/3Tb1yqz**.

Marine growth prevention

ElectroSea has introduced a new product to prevent marine growth in its strainer basket and through seawater lines.

The all-in-one ElectroStrainer combines three components: a biofouling prevention device, a hydrodynamic sea strainer, and a smart flow monitoring system.

"ElectroStrainer is an innovative product that significantly decreases time spent in the engine room checking and cleaning sea strainers," said Daniel Cosentino, ElectroSea's CEO. "Boat owners and captains loathe dirty, fouled sea strainers that require constant maintenance.

He added: "ElectroStrainer prevents biofouling right in its integrated strainer basket. In addition, the system provides real-time seawater flow data and alerts you when it's time to check ElectroStrainer's basket."
Features of the system include the use of smart 'Strainer Alert' technology that uses ElectroSea's ClearVis flow sensor and control system, displaying a message if debris, grass, or seaweed is in the straining basket.

A sustainable alternative to carbon fibre?

Photo credit: GREENBOATS

A consortium of science and industry has created what it calls a sustainable alternative to virgin carbon fibre. The textile, developed by GREENBOATS, Swiss-CMT and the Leibniz Institute for Composite Materials, uses recovered carbon fibres from non-woven fabrics with lower mechanical properties and significantly higher resin absorption.

"There are areas of application where carbon fibres are simply vastly superior to other materials hence the need to look at comparable alternatives," said Paul Riesen, head of R&D at GREENBOATS.

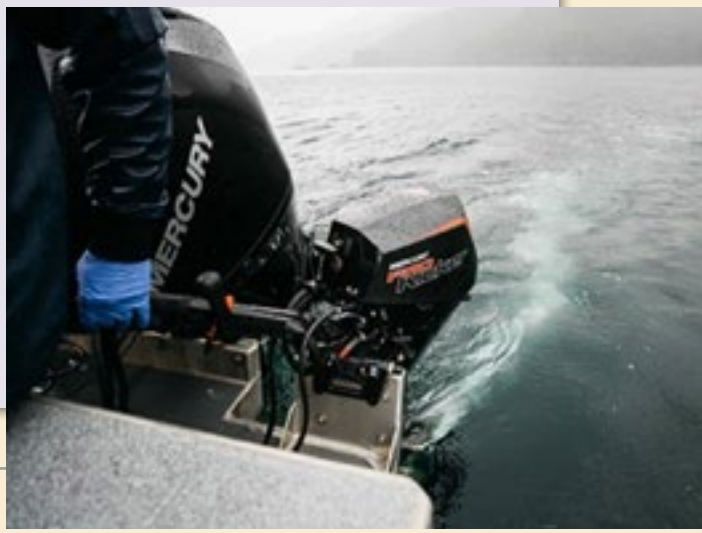
Bio-based natural fibres are the core business of GREENBOATS and it has already manufactured entire sailing yachts, cabins for wind turbines, or parts for the aerospace industry from flax and other natural materials. But the recycling of materials of fossil origin has always been on the agenda.

The MarineCare project - Sustainable composite materials made of recycled carbon fibres and bio-based powder resin for maritime applications is carried out as part of the European funding program 'Eurostars' and the German partners are funded by the Federal Ministry of Education and Research.

Mercury introduces next-gen four-stroke outboards

The Mercury Marine division of Brunswick Corporation has introduced its next generation of 25hp and 30hp four-stroke outboards. The outboards feature a three-cylinder, 500cc powerhead with electronic fuel injection. For the first time, electric-start models in 25hp and 30hp come standard with Mercury SmartCraft digital technologies, allowing boaters to connect to the most advanced digital gauges in the industry and to mobile devices through VesselView Mobile.

"Mercury's new 25hp and 30hp platform brings new capabilities and a better consumer experience to a wide variety of recreational and commercial boats," says Chris Drees, Mercury Marine president. "In addition to being lighter, faster and quieter, the new engines in this line-up deliver what boaters have been asking us for with exciting new options like digital technologies and an ergonomically-positioned tiller handle."



New saildrive prop

GORI Propeller has introduced its three-blade folding propeller designed to suit the ZF SD15 saildrive. Key features of the propeller include a low drag, the same pitch in forward and reverse as the blades pivot 180 degrees and the same pitch in forward and reverse for improved stopping. The propeller sizes range from 22 inches to 26 inches in diameter, available in the standard version with overdrive, and the single pitch version.

"We have seen an increase in customers choosing saildrive units over the traditional shaft drives," said Lars Østergaard, senior vice president sales for GORI Propeller. "We have now evolved our popular three-blade propeller so those with a saildrive unit can reap the benefits."

New battery-powered air con

A revolution in marine air conditioning has begun with the launch of battery-powered units that can run from direct current (DC) alone. A boat's batteries provide DC energy to a variety of onboard devices like lights and electronics. Typically, however, high power appliances like air conditioners often still require alternating current from shore power, or the constant use of a generator.

The battery charger uses either shore power whilst at dock or engine power through an alternator whilst at sea. Li-ion batteries provide high density storage of this energy which is then used to power the 12V air conditioning unit. The system is especially well suited to smaller boats, both power and sail, which don't already have a generator.

Mabru's 12V heat pump range comprises three models with cooling capacities ranging from 3,500 btu to 12,500 btu. Each has a 70/30 CuNi condenser and can run for up to four hours on a single 28 LBS, MPS 31 series lithium battery.

A new fuel sender adaptor from Oceanic Systems

The 3130 Adaptor aids boat builders who want to avoid multiple senders in each fuel tank. The 3130 NMEA2000 Fuel Sender to Resistive Output Adaptor by Oceanic Systems, accurately shows fuel levels on Volvo and other MFD's from a single sender.

Oceanic Systems said that the adaptor connects from the NMEA2000 network to the resistive input connection on the engine ECU. The fuel levels show identically on both displays without needing a second resistive fuel sender in the tank.

The company designed the adaptor at the request of a number of boat builders who wanted to avoid multiple senders in each fuel tank and make a vessel's fuel system more reliable at a lower cost.

Balmar unveils new Alternator Protection Module

DC charging solutions specialist Balmar has designed a new low-cost, high-value Alternator Protection Module, offering surge protection. Balmar APM devices can be used to protect all alternator brands, excelling in both short duration and longer duration spikes where other products fail, the company claims.

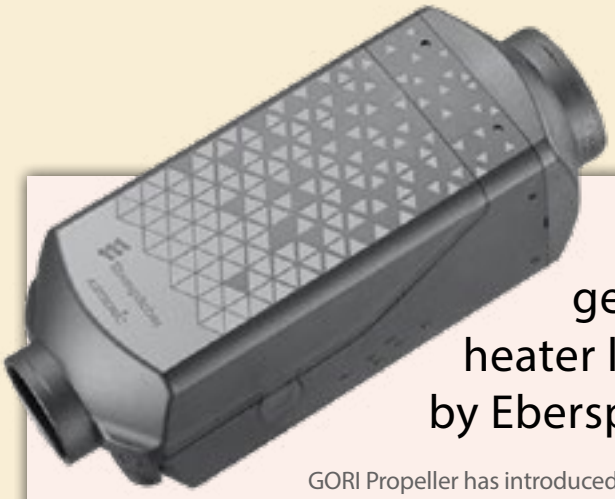
Mounted on the rear of any alternator, the Balmar APM is designed to absorb voltage and current spikes that commonly occur in many onboard electrical distribution systems from intermittent connections, disconnects and over-voltage events.

Lithium battery adoption has introduced a new problem if a battery disconnects due to an internal fault or issue. A battery-initiated disconnect during charging can induce a voltage surge which will damage the alternator's rectifier diodes or internal regulator and render the unit inoperable.

First outboard from Remigo

Remigo's electric outboard motor, RemigoOne is fully encapsulated and will provide 35kg of thrust - comparable to around 3hp. The Slovenian designed and manufactured motor is due to be available in the UK in September through Silent Yachting and will provide an average 14 NM range, easy handling, and a three-hour recharge cycle on AC, with smart charging capabilities for onboard 12-24 DC wiring.

It is the first product from the manufacturer which has developed it with an aluminium case designed and shaped to resemble a rudder. The Remigo is constructed with a 1000W electric brushless DC motor, a 1000Wh Li-Ion battery, an integrated smart battery management module for enhanced safety, and a two-button power control module with ten-step forward/backward logic. The unit weighs 13.5kg and its upper part is watertight to IP67 standard - the submerged part is IP 69.



generation heater launched by Eberspaecher's

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Sustainable 3D printed sloops

A new company is putting innovation and sustainability first with its new range of 3D printed sloops. Sloepmakerij produces 3D printed sloops, one-masted sailing boats with a mainsail and jib rigged fore and aft, made from recycled material including PET bottles.

The boat builder, which won the Dutch startup of the year 2021, produces its sloops from designs by Martin Bekebrede, among others. Sloepmakerij developed the processs for the production of its sloops with with TU Delft, with whom it worked in collaboration to validate the sloops scientifically with a Life Cycle Assessment (LCA). By looking at a sloop's impact on human health and the environment, the company has been able to determine a sustainability score for each sloop. In addition, all of the sloops it produces are individually inspected and comply with CE certification.

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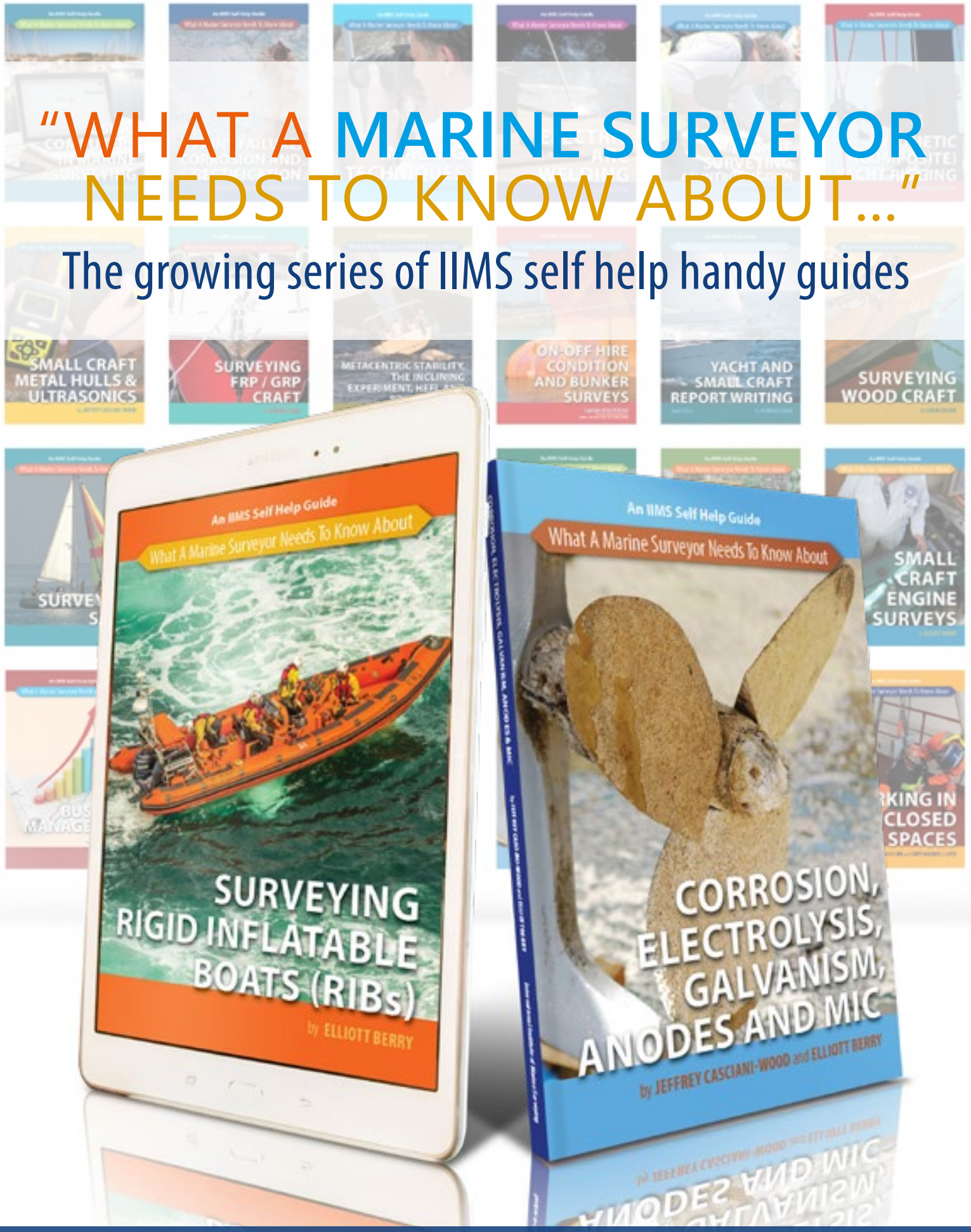

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