THE REPORT

The Magazine of the International Institute of Marine Surveying

DECEMBER 2020
ISSUE 94

2020 REVIEW: THE YEAR THAT CHANGED THE SURVEYING PROFESSION

CARGO LIQUEFACTION GUIDELINES

MAKING A HASH OF LASHING

NEW FLAX AND BASALT FIBRE COMPOSITES

ALTERNATIVES TO AT SEA DISPOSAL FOR END-OF-LIFE REINFORCED PLASTIC VESSELS

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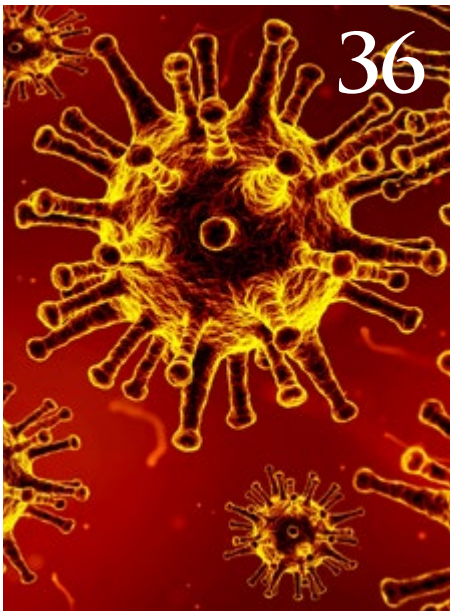

Editor's Letter

Dear Colleague

I am especially proud to have edited this bumper edition of the Report Magazine, which once again sets a new record as the biggest we have produced. In my opinion, edition 94 is one of the most complete magazines we have published to date, by which I mean the breadth of content is so wide and varied.

At the end of the strangest year ever known to most of us, I have tried to set down my thoughts to accurately reflect my experiences of 2020 - a year never to be forgotten - which on one hand has seen the world engulfed by the worst pandemic for a century, yet on the other has been a productive and progressive one for many surveyors and for the Institute too (see my 2020 review on page 36).

The troubling subject of end of life boats is one The Report Magazine has brought to readers' attention before. Yet the challenge of how to deal with them remains unclear. What's more, there is emerging evidence of the potential health hazards of such vessels. The article entitled Abandoned fibreglass boats are releasing toxins and microplastics across the world by Corina Ciocan makes for sobering reading (page 54). On a more upbeat note, Corina's article is counterbalanced by Simonetta Pegorari, who looks at a new and more environmentally friendly composite, basalt fibre (page 56).

The now infamous MV Wakashio disaster that happened at Mauritius earlier in the year - the cause of so much angst for the local population - has attracted much attention, and rightly so. As an outline of what probably happened has started to emerge and IMOs actions in response to the event have become understood, there are many questions to be answered and lessons to be learnt. There are two excellent and thought provoking articles on this topic to read.

Inviting a number of members to contribute to a special article on COVID-19 and how it has affected marine surveying (page 43) seemed like a good idea - and I am grateful to those who took up my challenge. But as you read their accounts, it is apparent that the situation is almost the same worldwide. Perhaps I was expecting to see some differences from country to country, but that is not the case it seems.

There are several articles on topics of direct relevance to cargo and commercial ship surveyors, including why stainless steel in scrubber manufacture is the best option to minimise corrosion (page 100), cargo liquefaction guidelines (page 86), the new IMSBC Code amendments (page 89) and making a hash of lashings (page 81).

For a bit of fun, I challenge you to test your knowledge about how much you know of the industry in which you work and to look at future trends. The article entitled Shipping, superyacht and boating facts, statistics and trends. 'How well do you know your industry?' proved to be something of a labour of love to compile (see page 91). It should act as a reminder (as if you needed one) that you operate in a massively valuable worldwide industry.

My thanks to Uday Moorthi, the subject of A day in the Life of feature (page 109) for answering my questions and sharing his back story and marine surveying ethos.

And to everyone who has contributed to The Report Magazine in 2020, it is much appreciated.

As always, if you celebrate Christmas and its associated festivities, I wish you a happy digital Yuletide! Let's join together to wish each other the best for a much less stressful 2021.

Mike

Mike Schwarz,
Chief Executive Officer

The President's Column

Dear IIMS Member

The last six months has been a real roller-coaster for me personally and also for the Head Office team. Mike and I have spent so much time in contact with each other I did wonder whether I should move into the office myself, however with recent unfortunate events regarding the COVID-19 infection which has affected almost all of the office staff, perhaps that would not have been a good decision.

In September's Report Magazine I said I hoped that there would be light at the end of the tunnel in regard to COVID-19, but this has proved to be optimistic and unfortunately our worst fears are coming true and the winter looks like being a trying time for everyone, perhaps with the news of possible vaccines being available. The spring will see more positive progress and see a return to what we used to consider a more normal life.

I recently read an account of an incident involving the accidental deaths of two unfortunate small craft occupants due to Carbon Monoxide poisoning (see IIMS November News Bulletin link to the MAIB Safety Bulletin SB2 2020). This was not an isolated incident and there have been many more instances of this silent invisible killer on both commercial and pleasure vessels. The incident highlighted the need for surveyors to act in the absence of current mandatory requirements. Until legislation is passed and Manufacturers, Certifying Authorities and Installation engineers are required by law to ensure that CO detectors are fitted to vessels it remains down to the individual vessel owners and operators to do so. This means that potentially the only professional and responsible people who attend on board a vessel are Marine Surveyors, who should assess the risk during their attendances for survey be it pre-purchase, insurance, valuation,

or indeed any other reason for them to be on board a vessel, whether it is a requirement of their attendance instructions or not. It is a wakeup call to all surveyors to remember that they have a duty of care and include some statement along the lines of "Although not part of this particular level of survey or our instructions we must bring to your attention that" and include any advice that the surveyor can offer to improve the safety of the vessel. In some of the accident reports "although no blame is apportioned" it was obvious that at least one of the vessels had been quite recently surveyed. The loss of life in the most recent cases had been the result of in one instance a diesel heater, another a butane-fuelled gas cooker, two instances with petrol inboard engines, and one a petrol generator, diesel inboard engines are also a source of Carbon Monoxide as are solid fuel heaters. My conclusion is that unless a vessel is an open sailing or rowing dinghy there will most probably be a requirement to assess whether CO detectors should be installed and if they are installed do they work, when I spoke to Fraser Noble regarding this subject he recounted an example where several detectors were fitted, but none worked; and I found a vessel recently which had two CO detectors one in each cabin area and one of which had the wires cut presumably to silence the alarm, (when was the last time you checked the batteries in your home smoke alarm)?

Over half of these incidents involved Inland Waterways Craft. In 2014 the MCA and the Association of Inland Navigation Authorities produced the Inland Waters Small Passenger Boat Code which is a code of practice for small commercial vessels operating in category A, B, C and D waters, and other inland waters, which specified Hydrocarbon detectors on vessels with gas consuming devices, unfortunately not all gas detectors detect Carbon Monoxide, since then, as recently as 1st April 2019 there has become a BSS requirement for CO detectors on inland waterways craft, but at the time of writing no such mandatory requirements exist for other vessels.

To link this to the Large Commercial Vessel world it also never ceases to amaze me having had a recent conversation with Mike Schwarz that there are still deaths being recorded on ships from the entry of persons into confined spaces. I recall my time as a young ships engineer having to be able to recite the requirements for entry into confined spaces and carrying out these requirements for routine tank and void space inspections, when Davis Safety Lamps were the norm and a supply of Sperm Oil (always a source of amusement) was required and you relied on your 'Oppo' to keep the end of the hose connected to your face mask clear of noxious smelling influences. These days things are more swept up and battery powered atmosphere detectors should be part of every surveyor's kit, should he be required to enter a confined space. I recall the training video's where a succession of people entered a confined space to try and find out what had happened to the previous member of the team, each one died and the bodies piled up at the bottom of the ladder before someone outside realised what was happening, even in one of the Carbon Monoxide cases mentioned earlier a trained fire fighter and a member of the public both suffered from Carbon Monoxide Poisoning whilst trying to resuscitate the original casualty, fortunately this was realised in time and they were taken out of the vessel and suffered no long lasting effects.

Any space which has remained closed and unventilated for an appreciable length of time constitutes a confined space even the inside of a small boat. It does not take much, Oxygen is used in the process of corrosion and within a tank or void space the usual Oxygen level in the atmosphere of approximately 21% only has to drop to 19.5% to be considered an Oxygen depleted atmosphere. But it's not just depleted atmosphere you may be confronted with it could be fungal spores, methane, or just good old fashioned foul air. I would hope that all professional marine surveyors produce risk assessments to cover the various tasks which they undertake, if nothing else producing risk assessments focus the mind and make you think about the risks and hazards. I would also hope that all surveyors are aware of the obvious ones, safe use of ladders and working at height, wearing of life jackets etc and I am sure some of you have found recently that Covid 19 has caused additional risk assessments, which we may not have previously thought about. I would certainly advise keeping copies of these and your public liability insurance with you at all times to ensure free access to yards and vessels for survey.

The amount of claims and complaints regarding small craft surveyors continues to sadden me. I know that the reality of a pre-purchase survey is a long way from the commercial vessel classification society periodic survey where when I was a shipyard manager we would spend the first week of a docking preparing the vessel for survey, creating safe access, fire point, safety equipment, opening ventilating and cleaning tanks and spaces, removing propellers, pulling shafts, opening engines and removing pistons as required etc etc. all in advance of the surveyors attendance. However it is apparent that pre-purchase surveys of vessels are continuing to be undertaken in unsuitable conditions, unintentionally or perhaps driven by commercial pressure to reduce costs, or even some misguided good intentions. I will remind you all that the pathway to hell is paved with such good intentions. I know from personal experience that if there is a survey sure to go wrong and cause trouble in the future it will be the one which started with an enquiry along the lines of "Can you do me a favour" and it would appear that there may be some "I would be grateful if you could" cases out there as well, even the all too common "I need this done as soon as possible". Surveyors will often have pressure put upon them, but whatever the circumstances surveyors must above all be honest, unbiased, and truthful in the results of their instructions irrespective of how much grief this may cause. Being a good surveyor is not a popularity contest it is a professional contest, if you wish and one in which the best and most professional person wins, even if this means that your friend or regular client decides to go elsewhere for his surveying work, this is the price that you have to pay for being an 'Independent Marine Surveyor'.

Going back to inland waterways craft I had reason to research the standards and rules which should be applied to the inspection and operation of these vessels. I was amazed to find that many surveyors of inland waterways craft had little knowledge of the rules and that they applied their own standards and formed their own opinions. As a result, Mike and I have been invited to raise questions for British Marine which can then be brought up at the next inland boatbuilding association committee meeting.

Contrary to popular belief the MCA continues to be setting the standards for Construction and Maintenance of inland waterways craft and as mentioned earlier a code of practice for Inland Waters Small Passenger Boats in cooperation with The Association of Inland Navigation Authorities and British Marine have produced a Code of Practice for Inland Boatbuilding. Unfortunately, all this means is that there are a number of rules and standards and also a number of associations are involved - in fact over 60 different inland waterways authorities at my last count.

All interested members are invited to follow the links that we will publish and view the documents and Mike and I would be grateful for any feedback, which could assist us in raising our questions for British Marine. This is why we as an institute are continuing to produce quality training for members and non-members and set high standards that all IIMS members and ultimately all Accredited Surveyors will need to achieve. I believe we are getting ever closer to achieving an international requirement for all Marine Surveyors to have to prove that they are professional people qualified to conduct surveys on both commercial and pleasure vessels. I am not naïve enough to think that this will happen in the short term but this is something that must be done and I am pleased to be a part of the Institute that is at least standing up and starting the process which I hope will ultimately reach a successful completion.

Geoff Waddington

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RMI PUBLISHES ITS ANNUAL REPORT ON MARINE CASUALTIES

Marshall Islands Register has published its Annual Report on the investigation of Marine Casualties, revealing that it received reports of 806 very serious marine casualties, marine incidents, and occurrences in 2019. Accidental falls, enclosed space incidents and collisions-groundings during pilotage were the main issues of concern last year.

Specifically, during 2019:

- 17 very serious casualties were reported to the Administrator. Two very serious casualties resulted in the constructive total loss of a ship, while 11 others resulted in the loss of one or more lives. Additionally, four occurred on yachts and resulted in their constructive total loss due to fire.
- Accidental falls were the leading cause of death during 2019, with seven lives lost. Four of these fatalities were the result of falls from height and three were falls overboard. Improper enclosed space entry also resulted in the loss of two seafarers
- There were 331 marine casualties.
- Serious injuries (resulting in incapacitation for 72 hours or more) were by far the most frequently occurring marine casualty during 2019, accounting for 158 of the 331 total marine casualties reported to the Administrator.
- There was a total of 346 marine incidents.
- There were 112 occurrences.

Read the full article and download the report at **https://bit.ly/2T9ObcJ**.

COCKWELLS MODERN & CLASSIC BOATBUILDING ACQUIRES HARDY MARINE

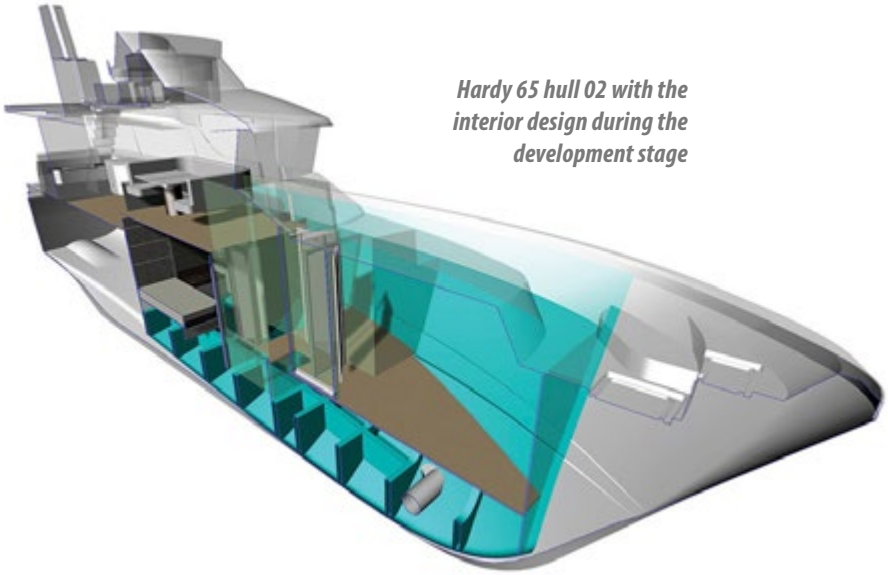
Cockwells Modern & Classic Boatbuilding has acquired Hardy Marine in a deal that will result in the further expansion of this award-winning Cornish company that celebrates its 25th anniversary in 2021. With a heritage spanning four decades, Hardy Marine has earned its reputation for building sturdy, high quality, all-weather motorboats that combine excellent engineering with impressive seakeeping and elegant interiors from its Norfolk base.

Delivering a range of boats that meet a variety of requirements, the Hardy name has become synonymous with quality, comfort, strength and experience. This, together with superlative after-sales support, has translated into a loyal customer base, repeat business and robust brokerage values.

In parallel with Cockwells' Duchy Motor Launches, the hulls of the Hardy 26 up to the Hardy 65 are semi-displacement designs from the drawing board of Andrew Wolstenholme, who is, arguably, the UK's leading naval architect in this category.

"Both Cockwells and Hardy are committed to building exceptional motorboats that deliver style, reliability, customisation and all the advantages that technological advances can supply," explains Founder and Managing Director, Dave Cockwell.

"We plan to build on the seakeeping and styling of the Hardy brand, and introduce Duchy-like finesse to some of the fittings such as Cockwells' famous joinery and cutting-edge superyacht technology – to make the Hardy even more yacht," Dave adds.



Hardy 65 hull 02 with the interior design during the development stage

LIFE SAVING APPLIANCES SERVICE SCHEDULES SHOULD BE MAINTAINED WARNS SURVITEC

With an increasing number of vessels returning to service following the easing of Covid-19 restrictions, Survitec is advising that ships' life saving appliances are maintained according to their original service schedules in order to avoid delays.

Operators must have a valid safety certificate in place before their vessels can return to service after lockdown and while some flags have allowed three to five month extensions, there are concerns that there will be a backlog of equipment requiring service, which could render the vessel unable to return to service until certificates of compliance have been issued or extensions approved.

Survitec singles out the cruise and ferry segment as posing a particular challenge due to the volume of safety equipment onboard that could require servicing.

Highlighting a potential bottleneck as demand for safety equipment servicing ramps up, Survitec has advised its customers to keep to their original life saving appliances maintenance plans where possible and ensure approved service providers are kept abreast of vessel movements so that safety equipment can be booked in and certificates issued in time.

"Due to the pandemic and subsequent travel restrictions, classification surveyors have experienced difficulties arranging surveys and carrying out onboard activities to meet statutory requirements. As a consequence, Flag States have granted extensions on many of the certificates issued so that vessels can remain compliant. They have taken a very pragmatic approach in dealing with vessels on a case-by-case basis, with three to five month extensions being approved," said Chief Operating Officer Claude Sada.

In accordance with SOLAS Chapter 1 Regulation 14, safety certificate extensions can be issued for liferafts, lifeboats, marine evacuation systems (MES), davits and launching appliances.

However, the first round of extensions is now coming to an end and those extensions issued in the second half of 2020 will start to expire from early 2021.

ABS ISSUES BALLAST WATER MANAGEMENT FOR YACHTS GUIDE

American Bureau of Shipping (ABS) has published a ballast water management for yachts guide now that they are now required to comply with the IMO International Convention for the Control and management of Ships' Ballast Water and Sediments (BWM Convention) which requires an approved ballast water management system.

As all vessels, yachts are included within the definitions of the BWM Convention according to Article 1.12, whereby a "Ship" means a vessel of any type whatsoever operating in the aquatic environment.

Specifically, the ballast water management for yachts guide highlights that new vessels (keel laying date after September 8, 2017) are required to comply with the D-2 standard at delivery.

On the other hand, for existing yachts (keel laying date before September 8, 2017), compliance with D-2 performance standard depends on the renewal date of the International Oil Pollution Prevention (IOPP) certificate.

Read the full article and download the report at **https://bit.ly/31sfzqQ**.

UK SHIP REGISTER SHOWCASES NEW LOOK AS IT LAUNCHES ONLINE REGISTRATION

The UK Ship Register has released a new look Red Ensign alongside its complete online registration system. The upgrade is part of the continued modernisation of its services to ship owners and operators worldwide and bolsters its international offer.
Customers are invited to use the digital UKSR portal which offers self-serve capability for registering a new vessel and renewing registration. Owners will also be able to provisionally check a vessel's name and request transcripts online. The launch follows months of development and testing, throughout which customers were consulted and helped to shape the tool, which will add real value to their operations.

It is available for all parts of the register. Commercial and Fishing vessel operators, as well as pleasure boat owners and Bareboat Charters, will all benefit.

Last year the UK Ship Register was integrated into a wider directorate delivering world-class maritime services to the UK Fleet, headed by director Katy Ware. The updated logo unites all services under the Red Ensign and reflects the modern international service.

Katy said "We made a commitment last year to become the best performing international ship register and digitalising our services was an important next step for our customers. We have collaborated with them throughout the process and I am confident we have delivered a commercial tool that supports and adds value to their operations."

NETHERLANDS SET TO BAN DEGASSING OF SHIPS IN TRANSIT

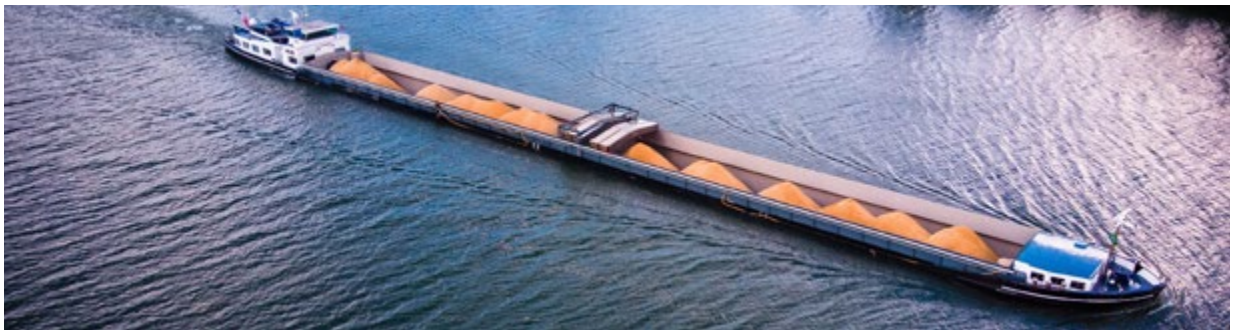
As there is more focus on the environmental impact and all forms of emissions in the shipping sector, the practice known as degassing is coming under scrutiny. In particular, the Netherlands looks set to ban degassing of ships in transit.

The concerns focus on the potential for the release of harmful gasses with volatile organic compounds (VOCs) during the process known in the industry as degassing. Environmentalists contend that the process creates health risks for crew, workers in the port, and surrounding communities. They believe it is hazardous to the environment and creates safety risks in the port.

After unloading a liquid cargo, and before they can take on new shipments, ships need to vent their tanks to remove any remaining gas vapour. These vapours can be very dangerous and potentially explosive for the ship. In addition, the tanks need to be free of these residues from their previous shipments to ensure they are within specifications before loading commences.

According to the Dutch authorities, it is common practice for ships and especially barges and smaller vessels working on coastal and inland routes to degas while in transit. This is the practice that they are especially looking at eliminating while creating an environmentally responsible alternative for this necessary process.

"It is important to me that we quickly arrange good alternatives to releasing vapours while en route," said Minister Van Nieuwenhuizen. "The existing procedure creates health risks for crews and local residents and is hazardous to the environment. We need to quickly determine the best alternative to this practice, and these tests will help."



CE mark Approved

UK TO ACCEPT CE-CERTIFIED PRODUCTS WITH RECREATIONAL CRAFT DIRECTIVE UNTIL END OF 2021

IMCI, the Brussels-based International Marine Certification Institute, has issued a statement to say that all products that are certified under the Recreational Craft Directive (RCD) by IMCI will be able to be placed on the UK market with the CE mark until 1 January 2022.

According to new guidance released by the UK government, industry will be able to use the CE marking until 31 December 2021 if any of the following apply:

- CE marking is applied to goods on the basis of self-declaration
- a mandatory third-party conformity assessment was carried out by an EU-recognised Notified Body (including a body in a country with which the EU has a relevant mutual recognition agreement)
- the certificate of conformity previously held by a UK Approved Body has been transferred to an EU-recognised Notified Body

However, industry can only place CE marked goods that meet EU requirements in Great Britain while UK and EU requirements are the same. This will be the case on 1 January 2021 and there are neither UK nor EU plans to diverge at this time.

CARGO COLLECTIVE PUBLISHES A QUICK GUIDE TO CONTAINER PACKING AND THE CTU CODE

Five international freight transport and cargo handling organisations have published a Quick Guide to the United Nations sponsored Code of Practice for Packing of Cargo Transport Units (the CTU Code), together with a checklist of actions and responsibilities for those involved. It is part of a range of activities to further the adoption and implementation of crucial safety practices by the Container Owners Association, the Global Shippers Forum, the International Cargo Handling Co-ordination Association, the TT Club and the World Shipping Council.

With several container fires aboard ships recently, some of them fatal, the organisations believe that adherence to the CTU Code by all parties would significantly reduce incidents.

Container stack failures, vehicle roll-overs, train derailments, internal cargo collapses and even pest contamination can also be traced to poor packing, they say.

Significant steps have been made in recent months with initiatives to screen cargo effectively, particularly responding to the concerns over the misdeclaration of shipments.

"Carriers have been advancing their capability to screen cargo at the time of booking in order to combat the curses of error and fraud that cause misdeclarations and unacceptable risk for the industry," TT Club's Peregrine Storrs-Fox said.

Download the guide at **https://bit.ly/35gwhdO**.

PILOT REVEALS FINAL MOMENTS OF CAR CARRIER GOLDEN RAY TO COAST GUARD INVESTIGATION PANEL

In testimony before a U.S. Coast Guard investigation panel, the pilot on the last voyage of the car carrier Golden Ray described the vessel's final moments – an account never before released to the public. Capt. Jonathan Tennant, an experienced pilot with the Brunswick Bar Pilots Association, brought the car carrier Golden Ray into port on September 7, 2019. The transit proceeded in a typical manner and she handled as normal, he testified.

When the vessel reached Buoy 20 in St. Simons Sound, she encountered an inbound tidal current, and Capt. Tennant ordered 20 degrees right rudder to offset it. At that time, "the vessel immediately took off to starboard, more so than I've ever experienced before," he said.

"When I went back to midships she leaned into the turn a little bit and started to over-rotate to starboard. Therefore, I applied counter-rudder [but] it wasn't an adequate amount, there was no deceleration of the turn to starboard," he said. "At this point I'm still level, I have no idea that I'm about to capsize."

Given the ship's strange behaviour, Capt. Tennant asked the captain what was going on. He also made a quick call to the pilot on the inbound vessel, saying "Watch out Jamie, I'm losing her." Then he applied maximum counter rudder (hard to port) as the vessel went over

Even after the vessel's propeller and rudder were out of the water, Capt. Tennant continued to give manoeuvring orders. Once he realised he was aground, he stopped trying to pilot the ship and switched to coordinating rescue operations with the U.S. Coast Guard.

SMALL CRAFT STANDARDS BULLETIN PUBLISHED BY ICOMIA

The International Council of Marine Industry Associations (ICOMIA) has released its latest Small Craft Standards Bulletin. The bulletin provides industry stakeholders with early notification on changes to existing standards or new work items that are developed and maintained by the ISO Technical Committee for Small Craft Standards (TC 188).

This edition includes an additional appendix at the end which covers various platforms available to use to access the ISO TC 188 Small Craft Standards.

The ICOMIA Small Craft Standards Bulletin is issued bi-annually and can be downloaded at **https://bit.ly/3dMJXRS**.

THE BIZARRE ACCOUNT OF HOW RCR SAVED 49 BOATS ON THE RIVER AVON IN AN 18 HOUR SHIFT

The River Canal Rescue (RCR) team managed to pull off a huge logistical feat to save 49 canal boats in one 18 hour shift in Bath. Disaster struck on the Kennet and Avon Canal when a sluice gate broke at Twerton. Water rapidly drained from the canal and in the space of an hour no more than a trickle was left.

Several boats were capsized completely when their tight moorings pulled them in the wrong direction as the water disappeared. In total 49 canal boats became stranded in thick silt for several days, with boats perched precariously on concrete slabs, on their sides or submerged in filthy water.

RCR is regularly called in to attend incidents with canal boats often involving flooding, but RCRs Ms Horton admitted that the emergency in Bath was of a "huge scale" and something they had not done before. By the end of Friday (September 18), 12 members of the RCR along with help from Canal and River Trust employees, Environment Agency and Bath and North East Somerset Council, managed to get every boat rescued.

Ms Horton explained: "We came up with a simple but effective plan to work down the river with our team controlling one section, the environment agency guys at another and the Canal and River Trust employees at another."

Despite supply issues created by coronavirus the rescue team managed to get all the extra equipment it had suddenly needed in less than 12 hours including, 20 bilge pumps and batteries, six Tirfor lifting and pulling machines, 100 meters of rope and 60 meters of hose.

What followed in the afternoon was a herculean effort to refloat the boats as the water was gradually re-introduced into the canal after it had been held back further up the river. This is again a technical job as many of the boats were sitting in the thick slit, so engineers needed to be on hand with winches and pullies to help the boats righten themselves correctly.

Ms Horton explained: "The problem is that many of them were underwater for a very long time and the water is full of debris. At least four of them will need a complete rework and need to be craned out of the canal and taken away."

MAMBO: WORLD'S FIRST 3D PRINTED FIBERGLASS BOAT USING A THERMOSET CONTINUOUS FIBRE COMPOSITE MATERIAL

Italian start-up, Moi Composites, has unveiled its MAMBO (Motor Additive Manufacturing Boat). The MAMBO is the world's first real 3D printed fiberglass boat using a thermoset continuous fibre composite material, demonstrating a new, unique shaped boat that cannot be achieved with traditional manufacturing.

At 6.5 metres long by 2.5 metres wide, MAMBO has a dry weight of approximately 800kg, and is equipped with a real navigation system, cork flooring, white leather seats, and a 115 cv engine. The hull is an inverted tricycle inspired by the famous Arcidiavolo by Sonny Levi.

The 3D printed fiberglass boat was digitally crafted in patented 3D printing technology, Continuous Fibre Manufacturing (CFM), developed by Moi Composites.

CFM technology involves the use of robotic machines, capable of depositing continuous fibres impregnated with thermosetting resin in order to create products with optimised performance, starting from a three-dimensional model of the object. According to 3D Printing Media Network, this allows the creation of fibre-reinforced products with mechanical characteristics comparable to those of unidirectional fiberglass, without the aid of models, moulds and other tooling equipment. It is, therefore, possible to obtain not only prototypes but real products in small lots or unique pieces, efficiently and cost-effectively.

NEW ELECTRIC FERRIES TAKE TO THE WATER IN PLYMOUTH AND PARIS

The UK's first sea-going electric ferries has set sail for the first time in Plymouth. Plymouth Boat Trips and Voyager Marine, Cornwall has partnered with the University of Plymouth, the University of Exeter, Teignbridge Propellers, MarRi-UK and EV Parts UK to make the project come to life.

The boat has been completely rebuilt over several months and will undergo rigorous trials – including assessments of its emissions – before it carries its first paying passengers in April 2021.

"It's hugely exciting to see the launch of e-Voyager and the result of such a progressive collaboration to create a cleaner and more sustainable future for the marine industry," says Andy Hurley, project leader for Plymouth Boat Trips and Voyager Marine.

The e-Voyager is powered by repurposed, Nissan Leaf batteries, meaning they will need almost no maintenance and have clear commercial benefits for businesses in the marine sector. Scientists from the University of Plymouth carried out research during the build, measuring emissions including noise pollution, air pollution and fuel consumption.

Engineering technology company EV Parts has installed an advanced electric motor, together with fly-by-wire controls, to replace the traditional diesel engine, a process which will be directly transferable in under 24m commercial vessels.

Whilst in Paris, Bellmarine has launched its new electric vessel. Following the launch using a system by its brand Bellmarine, Fischer Panda UK is highlighting its strengthened capabilities to collaborate with boat builders on projects to launch more electric powered vessels onto UK waters.

As the exclusive UK distributor for Bellmarine, Fischer Panda offers similar systems to the one recently installed on the first of two 8.3m passenger boats to operate in Paris. Suitable for up to 12 people plus the skipper and with an autonomy of 24 hours, the vessel has a Bellmarine Transfluid electric system with two 15kW SailMasters, which are water-cooled and powered by lithium batteries. The ferry travels in silence at an average speed of 15km/h.

SEVEN MINUTE RECHARGE FOR ZERO-EMISSION FERRIES FOR NIAGARA FALLS TOUR

A pair of vessels installed with all-electric propulsion from ABB have been approved to enter service at Niagara Falls. The zero-emission ferries named the James V. Glynn and the Nikola Tesla are said to be the first all-electric vessels built in the US, with power drawn from a high-capacity battery pack supplied and integrated by ABB. In addition to batteries, ABB has supplied an integrated power and propulsion solution for the newbuild zero-emission ferries, including an offshore charging system, enabling sustainable operation.

"Maid of the Mist has always evolved with the technology, and we are thrilled to open a new page in our company's history, moving our fleet to zero-emission operation," says Christopher Glynn, president of Maid of the Mist Corp. "Close collaboration with ABB has been instrumental in making this project a success, and we are proud of what we were able to accomplish together."

"The vessels confirm growing acceptance of all-electric vessel propulsion," says Juha Koskela, ABB Marine & Ports Division president. "We applaud Maid of the Mist's decision to move to zero-emission operation and are honoured to have worked with this forward-thinking company on implementing the electric power and propulsion solution."

Each boat is powered by a pair of battery packs providing 316 kWh total capacity divided across two catamaran hulls. The batteries allow the electric propulsion motors to reach an output of up to 400 kW and are charged using locally produced hydroelectricity in a process that takes just seven minutes during disembarkation and boarding.

LBV35: WORLD'S MOST SUSTAINABLE BOAT TO DATE SET TO ARRIVE IN 2021

Next year La Belle Verde (LBV) and Innovation Yachts are launching the 'LBV35', said to be the world's most sustainable boat. LBV is a pioneer of the green boating movement, having designed, developed and introduced a fleet of solar powered, emission free vessels since launching in Ibiza 2014.

Maarten Bernhart, one of the founders of LBV said it was time for change. "There are currently around 20 million recreational vessels in the EU and USA, all built with highly toxic and nonrecyclable materials. All of these boats will end up on landfills or on the bottom of the sea within the next ten to 20 years," he said.

Having previously focused on reducing emissions by implementing solar-electric propulsion technology, attention now turns to materials, construction and lifespan. The LBV35 is a 100% recyclable composite boat; even the moulds are made of fully recyclable material and LBV has also committed to a sustainable 'loop' recycling model whereby the company will buy back the composite materials and reuse them for future builds.

Suitable for single-handed sailing and with a top speed of 22 knots, the LBV35 will be produced in Les Sables d'Olonne in France, home to Norbert Sedlacek's Innovation Yachts. "After 11 years of continuous development with fully recyclable, high end yacht building materials we are happy to become the home of the new LBV35," said Norbert Sedlacek.

BALTIC COUNTRIES TO LOOK AT NEW EVIDENCE ON 1994 ROLL-ON ROLL-OFF FERRY ESTONIA SINKING

The roll-on roll-off ferry Estonia, carrying 803 passengers and 186 crew, sank on a stormy Baltic Sea on September 28, 1994. The official investigation in 1997 concluded that the bow shield had failed, damaging the bow ramp and flooding the car deck. However, Sweden said that a Discovery Network documentary about the disaster included new underwater video images from the wreck site showing damage on the starboard side of the wreck.

"Estonia, Finland and Sweden have agreed that verification of the new information presented in the documentary will be made," the foreign ministers of the three countries said in a joint statement.

The Discovery Network documentary prompted some survivors and relatives of the roll-on-roll-off Estonia's victims to demand a new independent investigation and also spurred renewed speculation about the cause of the accident. "A hole in the hull was dismissed over the years," Kent Harstedt, a survivor and former member of the Swedish parliament, told a news conference on Monday. "What has emerged today adds to the question marks – why was the hole not included in the official investigation?"

Estonian public broadcaster ERR on Monday quoted Margus Kurm, a former state prosecutor and head of the committee that looked into the disaster from 2005 to 2009, as saying that a collision with a submarine could have caused the ferry to sink.

The roll-on roll-off ferry Estonia had been sailing from Estonia's capital Tallinn and was headed for Stockholm in bad weather. Winds were around 20 meters per second and the waves around 4 meters high, according to the official investigation.

After the bow shield failed, the ferry rapidly filled with water and most of those who died were trapped inside.

THE CANAL & RIVER TRUST ANNUAL REPORT SHOWS PROGRESS DESPITE SIGNIFICANT CHALLENGES

Boating numbers and income are up for 2019/20 according to the annual report and accounts published by the Canal & River Trust. The report charts a year when income, volunteering, and spend on the trust's charitable activities grew to record levels. Income increased by £6.1m to £216.1m and spend on charitable activities increased by £10.9m, with underlying expenditure on maintenance, repairs and infrastructure works continuing to grow.

Whilst boating was put on hold for most during the initial stages of the Covid-19 lockdown, there was a small growth in boat numbers and income from boating and moorings remained at just under 20% of income in 2019/20.

Richard Parry, chief executive at the Canal & River Trust, said that a lot had been achieved in the trust's eight years. "However this year has been a reminder of the scale of the trust's core responsibility, with a series of extreme weather events contributing to widespread infrastructure damage and the important role our waterways play within society, both as a network for boating, but also as vital green and blue corridors in our towns and cities," he said.

This year the trust's annual public meeting will be hosted online on October 28 with people able to view and submit questions to the chief executive and chair via the Canal & River Trust website.

Download the report at **https://bit.ly/2Hiji3e**.

CANADIAN GOVERNMENT PUBLISHES NEW MARINE NAVIGATION SAFETY REGULATIONS TO IMPROVE MARITIME SAFETY

The Government of Canada has published new Marine Navigation Safety Regulations 2020, which now apply to commercial vessels of all sizes, including fishing vessels, workboats, water taxis and ferries.

The regulations represent a consolidation of nine existing sets of marine safety regulations into a single one that:

- provides clearer and more up to date language on required navigational safety equipment;
- requires vessel owners to have equipment to help reduce the risk of collisions that could cause pollution, like oil spills, and threaten endangered marine life, such as whales;
- requires lifesaving equipment that will send emergency signals and provide the vessel's location; applies to over 23,000 commercial vessels of all sizes; and better aligns with international marine safety standards such as the International Convention for the Safety of Life at Sea.

Moreover, the new regulations include improved requirements to address important safety issues highlighted by serious marine occurrences, such as the fatal capsizing of the Leviathan II in 2017, after which the Chief Coroner, the Transportation Safety Board of Canada, and the Auditor General all made key safety recommendations.

These include requirements for commercial vessels to have equipment on board to help improve search and rescue efforts as well as for collision avoidance.

Read the new regulations at **https://bit.ly/3ngRI5R**.

REPORT bites

As melting sea ice opens the Arctic to navigation, more ships are plying the loosely regulated polar waters, bringing increasing amounts of climate-warming pollution says Reuters.

Germany's Nature And Biodiversity Conservation Union reports that the cruise industry is nowhere near meeting the requirements of the Paris climate goals, as several shipping companies have no specific strategy to become green.

Edison Chouest Offshore, Ørsted and Eversource have executed a long-term charter agreement for the provision of the first-ever Jones Act-compliant Service Operations Vessel for the US offshore wind industry.

Wight Shipyard Co has achieved a UK first by building four ferries simultaneously at its yard in Cowes for a leading Maltese tour operator.

Auckland's largest marina is undergoing a huge redevelopment project which will eventually see the addition of over 80 new berths. Westhaven Marina, situated in the heart of Auckland is expanding both on shore and on the water.

DNV GL has completed the world's first in-water remote ship surveys using a remotely operated vehicle. In-water bottom surveys using ROVs have now been carried out on three separate Wilson ASA-managed vessels, the first completed on the Wilson Fedje by a surveyor from Høvik.

The small craft panel at the International Organization for Standardization has announced the appointment of Craig Scholten as its new chairman for 2021-2023.

Safety Briefings

MAIB SAFETY DIGEST LESSONS FROM MARINE ACCIDENT REPORTS OCTOBER 2020 PUBLISHED

In an extract from the introduction to the latest and second MAIB Safety Digest October 2020, Andrew Moll, Chief Inspector of Marine Accidents said, "This has been a challenging year for us all, and some sectors of the marine industry have been very hard hit by the fallout from the COVID-19 pandemic.

It therefore pains me to say that overall this year there seems to be very little change in the overall rate at which accidents and incidents are occurring. The need to improve safety is therefore very much with us.

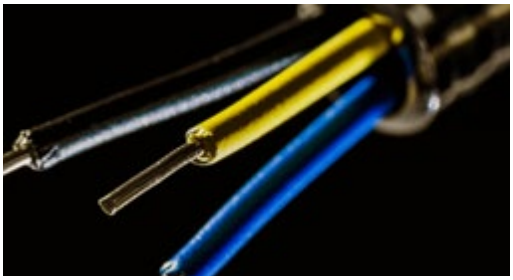
I would like to thank Mike Drake (Director Marine Operations, P&O Cruises, Australia) and Sean Friday (Inspector, MAIB) for the introductions they have written to the merchant vessel and fishing vessel sections of this edition. I was struck by Mike's comment that we need to understand the mind-set of the people doing the job before we improve their performance, and Sean's frustration that investigators so often see similar issues repeated time and time again in tragic accidents. Some years ago I was discussing a conflict with an army intelligence officer, who said to me, "they are losing, but they are not yet ready to stop fighting". His words made me think about people's resistance to or, conversely, willingness to change their approach.

This edition's Recreational Craft section does not have its own introduction as, unfortunately, the contributor had to back out at the last minute. It therefore falls to me to make some observations. The articles for the Recreational Craft section were chosen some weeks ago, and it is a coincidence that in this issue they are all about high-speed craft accidents. Unfortunately, it is likely that the spring 2021 Safety Digest will be similar, due to the high incidence of fatal and serious injury accidents involving RIBs, personal water craft (jetskis) and other high speed craft that have occurred this summer. It would not be right to read too much into this spike. Marine accidents are like buses: you can wait a long time for one and then a number arrive together. However, it could also be that the COVID-19 lockdown earlier this year prevented many leisure boaters from starting the season slowly, cautiously going afloat in late spring to refresh old skills before the good weather arrives. Whatever the reason, I would encourage all leisure boaters to take advantage of the winter months to refresh their knowledge, carry out the inevitable maintenance tasks, and to plan how best to start next year's boating seasons."

Capt Andrew Moll

Read or download the full Safety Digest at **https://bit.ly/3irnKJw**.

TRANSPORT MALTA DRAWS ATTENTION TO THE DANGERS OF SHEATHED STEEL WIRES



Following three incident investigations, Transport Malta has issued a safety notice to draw attention to the dangers of sheathed steel wires onboard ships. Their concern surrounds the restricted access to the wire rope for a thorough inspection and the possibility that corrosion might exist.

It is recommended that all concerned must check the condition of all lashings, lifting slings/strops and other loose gear as specified in the manufacturer's instructions for the use, size and construction of the wire. This advice is in addition to a recent warning by Tokyo MoU, highlighting the dangers of sheathed steel wires on board ships.

The Transport Malta notice also highlights that all Flexible Steel Wire Ropes (FSWR) and Extra Flexible Steel Wire Ropes (EFSWR) should conform to the design requirements recognised by a relevant International Standard.

Companies should consider means to ensure that the inspection of lifting slings or the FPD encased in plastic sheathing and the associated risks due to sheathing, are addressed in the Company's Safety Management System (SMS). All the relevant lifting equipment and loose gear should be thoroughly examined, operational tested, repaired and overhauled during the Annual Inspection in accordance with the requirements of the IMO adopted Resolution MSC.402(96).

Wire failure has been the critical factor these accidents says Transport Malta. This highlights the importance of:

- Ships' crews to follow established maintenance procedures, being observant during all maintenance tasks and being vigilant at all times.
- Assessing the current maintenance procedures to ensure their continued effectiveness.
- Effective crew familiarization and training, to enhance the competency of the crew while conducting test procedures and training drills.
- That ferrules should be compressed at an adequate pressure in order to securely fix the strands without the risk of spreading and that the wires inside the ferrule have to remain without sheathing.
- Specific inspections concentrated on signs of deterioration and damage.
- Time intervals between subsequent inspections may be reduced by the competent person depending on the condition of the FSWR / EFSWR.

PRELIMINARY ATSB INVESTIGATION REPORT SUGGESTS HEAVY CORROSION LED TO APL ENGLAND LOSS OF CONTAINERS

The 5,780 TEU APL England was rolling and pitching heavily in rough seas and high winds when it lost 50 containers overboard about 46 nautical miles south-east of Sydney on 24 May 2020, Australian Transport Safety Bureau (ATSB) said in its preliminary investigation report. While investigation is ongoing, the initial findings suggest heavy corrosion in many of the ship fittings, including lashing eyes, lashing bridges and deck structures.

Generally, the ship's lashing equipment appeared in good condition. However, many of the ship fittings including lashing eyes, lashing bridges and deck structures were found to be heavily corroded and wasted, noted Mr Hood.

In addition, the ATSB examination of the container stowage arrangement showed that the use of 'high cube' (2.9m/9ft 6in high) as opposed to standard height (2.6m/8ft 6in) containers in the ship's aft-most container bay, bay 62, affected the security of the stow above the container cell guides. However, the loading computer's lashing and forces checks did not show any conflicts for this arrangement.

Download the preliminary investigation report at **https://bit.ly/3mNWlnW**.

REPORT bites

The Port of Tyne's unique 2050 Maritime Innovation Hub – the UK's first and only Innovation centre for maritime – turned 1 recently.

The arrival of 'Mascotte', the largest surviving Bristol Channel pilot cutter, into her new home in Charlestown marks the launch of a new sailing trust, the Rich's Boat Charitable Trust, founded in memory of her skipper of nine years, Richard Clapham, who took his own life last year.

After the General Assembly, President Jean-Pierre Goudant, commented, "We have set the course for European Boating Industry to further grow the influence of the recreational boating industry at EU level."

The government of Georgia has confirmed its plans to turn the country into one of the centres of yachting on the Black Sea coast within the next few years, according to recent statements by senior government officials.

GreenSteam has identified a simple rule allowing vessel operators to reduce fuel wastage caused by hull fouling. Cleaning the vessel's hull before it reaches a critical level of 10% fouling will result in fuel savings of around 40%.

Gulf Star marina in Fort Meyers Beach, Florida, has completed what it calls the first fully-automated dry stack storage system in the United States at a price of US$20 million.

The largest superyacht project to be built ever in the Netherlands has been signed by AMELS Shipyard. The 120m Project Signature will be delivered in 2025.

The Scottish Government has awarded £1m of additional funding to Scottish Canals to undertake vital dredging works in the Highlands.

Safety Briefings

REPORT PUBLISHED INTO ALABAMA BOAT AND MARINA FIRE WHICH KILLED EIGHT PEOPLE

The National Transportation Safety Board (NTSB) has published its investigation report on the fire and explosion aboard houseboat Dixie Delight which spread through Jackson County Park Marina, Alabama, in January 2020, killing eight people. The report has highlighted that marinas should have measures and guidelines in place to prevent such incidents.

On 27 January 2020, about 0035 local time, fire broke out aboard the Dixie Delight, a 43-foot liveaboard houseboat, tied to Dock B at Jackson County Park Marina in Scottsboro, Alabama. The owner of the vessel attempted to extinguish the fire and push the burning vessel away from the dock, but the blaze engulfed the Dixie Delight and then spread to neighbouring vessels and the wood-framed covered dock. The fire trapped seventeen people on the dock. In the process of attempting to escape, eight people died.

Probable cause
The NTSB has said that the probable cause of the fire aboard the Dixie Delight and subsequent fire at Dock B was a fire of unknown source, originating aboard the Dixie Delight in the vicinity of the vessel's electrical panel. Contributing to the severity of the fire and loss of life were the County and marina's limited fire safety practices.

Analysis
The ignition source of the fire aboard the Dixie Delight could not be determined because of the scale of fire damage.

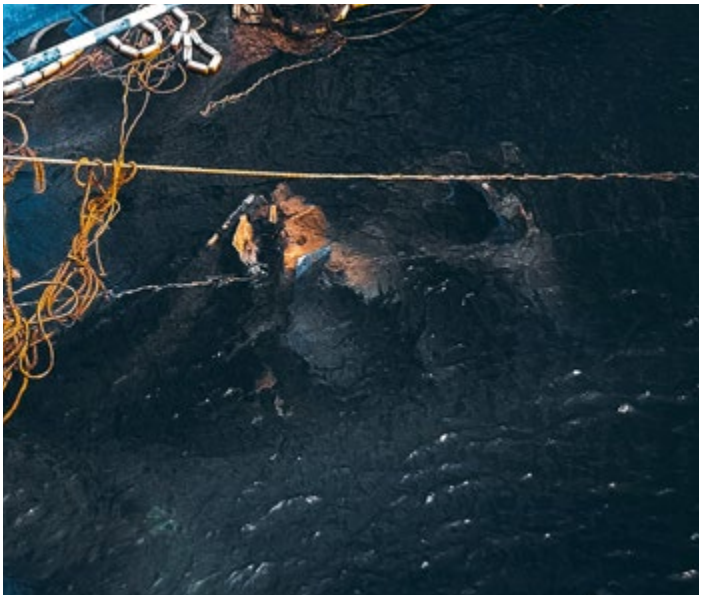
Considering the owner's first-hand account and where he first saw flames, it is likely that the fire originated in the bulkhead between the vessel's electrical panel and storage closet.

The fire spread due to the neighbouring vessels of similar fiberglass construction, an abundance of combustible lawn furniture on the vessel decks and open dock areas, and the presence of portable liquid propane cylinders used for barbecue grills, which all increased the dock's fire load.

Lessons learned
- The close proximity of vessels in marinas can cause fires to spread quickly, preventing evacuation.
- Marina owners should assess their own operations, consult relevant fire safety guidance, and review fire plans in concert with local fire departments.
- Marina boat owners should familiarize themselves with their marina's fire plan and review their vessels' potential fire hazards and firefighting equipment.

Read the full story and download the report at **https://bit.ly/36966rM**.

CRUCIAL SAFETY FLAW IS KEY FINDING OF INVESTIGATION INTO BOURBON RHODE SINKING AND FATALITIES



An accident investigation report by the Luxembourg authorities into the sinking of the vessel Bourbon Rhode with the tragic loss of four people on 26 September 2019 in the Atlantic Ocean has revealed a serious safety flaw of significance. The Bourbon Rhode, an anchor handling tug, sank on September 26 in the Atlantic Ocean during a transit voyage from Las Palmas to Guyana. The Luxembourg authorities have released an urgent safety bulletin as a consequence.

The Bourbon Rhode was equipped with a system called shark jaws, which is installed in the aft Z-Drive compartment to secure chains or wires during anchor handling operations. When operating, water from the deck can enter the watertight housing frame, which has three drain fittings at the bottom plate. When not in use, the shark jaws are lowered into the housing frame and sit flush with the deck. In the lowered position, gaps around the shark jaws allow water to enter the housing frame.

Probable Causes
The investigation has revealed that under unfavourable circumstances, the water quantity penetrating the compartment is likely to increase up to a point where, when unnoticed or unattended for a certain period of time, an unsafe condition may develop and lead to major flooding with subsequent foundering.

Immediate safety recommendation
The Bourbon Rhode report highlights that as an immediate safety measure, it is recommended to put in place an additional safety barrier through the SMS by implementing a procedural defence to limit the risk of flooding from leaking inspection covers of anchor handling systems.

Along with the existing maintenance instructions, the report notes the following as safety actions to be taken:

- Preventive actions to mitigate the risk of water ingress through the inspection openings during maintenance tasks on the anchor handling systems (e.g. sea state limitations, installation of anchor handling system deck cover plates);
- Instructions for the appropriate sealing method when installing the inspection covers to ensure the water tightness of the anchor handling system housing (e.g. application of silicone sealant, installation of gasket);
- Instructions for testing the water tightness of the anchor handling system after completion of the works and installation of the inspection covers (e.g. flooding of anchor handling system housing frame with closed drainage by use of fire hose);
- Maintenance actions to prevent degradation of the inspection covers and securing devices, which could compromise the water tightness of the anchor handling system;
- Appropriate documentation of the actions performed during the maintenance work.

During anchor handling activities, the manufacturer recommends maintenance of the shark jaws to be carried out once every week. One maintenance item is to remove the inspection covers at the side of the housing and to clean and remove sand, mud, or any obstructions from the inside of the housing frame. Upon completion of the maintenance, the inspection covers are to be installed with silicone sealant and gasket.

The Luxembourg Administration advises all operators of vessels equipped with the Plimsoll Smith Berger Hydraulic Shark Jaw system P3679-350MTTA or anchor handling systems with similar designs of the inspection covers to implement in the vessel operator's Safety Management System a standard procedure for tasks requiring the opening of the inspection covers of the anchor handling system housing frame.

Read the safety bulletin at **https://bit.ly/3cvPKu6**.

REPORT bites

A ten-year plan has been launched to create a Cold War naval museum in Plymouth with the hunter-killer submarine HMS Courageous at its heart.

Polish yacht-builder Sunreef Yachts is hiring 200 new employees for its shipyard in Gdansk, Poland.

The first Chinese built hybrid-electric emergency rescue vessel delivered to Shenzhen Maritime Safety Administration can be fully powered by batteries for up to three hours of operations.

Tokyo-based shipping company Asahi Tanker Co. has placed an order for the world's first electric-powered tankers. The two tankers, which were ordered at Kawasaki Heavy Industries, will be 100% powered by large-capacity lithium ion batteries for zero-emission operations.

Japanese shipping company NYK Line, shipbuilder Japan Marine United Corporation and classification society ClassNK signed a joint R&D agreement for the commercialisation of an ammonia-fuelled gas carrier that would use ammonia as the main fuel, in addition to an ammonia floating storage and regasification barge.

Associated British Ports, the owner and operator of the Port of Lowestoft, has invested more than £250,000 in the construction of a new fuel bunkering facility.

The shipping industry could have lost up to 40,000 jobs as more than 50% of the people in shipping lines work from home now due to the coronavirus pandemic, Lars Jensen, CEO, SeaIntelligence Consulting believes.

Spirit Yachts has successfully delivered its new 13.4m (44ft) Spirit 44CR (e) to her Canadian owner. The project is the first fully electric yacht to be designed and built by Spirit Yachts.

Safety Briefings

MACHINERY FAILURE CAUSED BY LUBRICATION CONTAMINATION CASE STUDY

The Swedish Club has described an incident of machinery failure onboard due to lubrication contamination in their system. An investigation showed that the engine had been operated on a high thermal load for a long time and the turbocharger's efficiency had been affected by fouling, while the lubrication oil had been contaminated for some time.

The vessel concerned was at anchor, in ballast, awaiting further instructions. The weather deteriorated after seven days and the vessel's anchor dragged. The anchor was heaved up and the vessel started to slow steam in the area. After about 24 hours, the differential pressure alarm of the main engine duplex lubrication oil filter sounded in the ECR. The crew found aluminium and other metal inside the lubrication filter. Metal particles were also found in the main engine's crankcase.

After consulting the owner, it was decided that the vessel should be towed to a lay-by berth. The investigation alongside revealed that the metal parts found in the lubrication oil filters came from piston rings and piston skirts. Three pistons had almost seized. The main engine, a 6-cylinder medium speed type, was severely damage and the following parts had to be renewed: all the cylinder liners, 3 complete pistons, piston rings on all cylinders, all the main and connecting rod bearings. In addition, the turbocharger had to be overhauled as the nozzle ring was broken. The complete lubrication system had to be carefully cleaned and flushed due to the lubrication contamination.

Findings

- At the time of the casualty the main engine, including the turbocharger, had been running for 7,300 hours since the previous major overhaul. This overhaul was done 18 months ago.
- Investigation of the maintenance records showed that maintenance had been carried out in accordance with the manufacturer's instructions.
- All fuel oil analyses from bunkering were within specification.
- Fuel oil samples before and after purifiers were taken and analysed. The result indicated that the purifiers were working satisfactorily.
- Several samples of the damaged piston rings were sent to a laboratory. The conclusion was that the excessive wear of the liners and pistons was not caused by catalytic fines.
- The cylinder liner lubrication system was tested and was found to be working properly.
- When reviewing the monthly main engine reports, it became obvious that the main engine exhaust temperatures of all the cylinder units had increased 30°C – 40°C since about six month ago.
- The turbocharger's revolutions had dropped from about 14,500 rpm to 12,000 rpm at 85% load and consequently the charge air pressure as well from 1.7 bar to 1.2 bar. These changes occurred as well about six month ago.
- Due to high exhaust gas temperatures, the engine was under a high thermal load, which finally caused it to breakdown.

POOR OVERSIGHT AND REGULATORY REQUIREMENTS LED TO THE FATAL CONCEPTION DIVE BOAT FIRE SAYS NTSB

Following investigation of the California dive boat fire that killed 34 people in 2019, the National Transportation Safety Board has called for major safety improvements to small passenger vessels, including interconnected smoke detectors and a USCG inspection program.

The 75-foot recreational diving vessel, Conception, with 33 passengers and six crew aboard, was anchored in Platts Harbor, off Santa Cruz Island, when it caught fire in the early morning of 2 September 2019.

All 33 passengers and one crewmember died of smoke inhalation after they were trapped in the berthing area while a fire raged on the deck above. Both exits from the berthing area led to the fire and smoke-filled enclosed area above.

After the incident, the NTSB called for all vessels similar to the Conception with overnight accommodation to be required to have interconnected smoke detectors in all passenger areas. It also recommended that a secondary means of escape lead into a different space than the primary exit, in case a single fire blocks both escape paths.

The NTSB also called on the USCG to develop and implement an inspection program to verify that roving patrols are conducted, as required, for the safety of sleeping passengers and crew. NTSB investigators found the absence of a required roving patrol on the Conception likely delayed the initial detection of the fire, allowed for its growth, precluded firefighting and evacuation efforts and directly led to the high number of fatalities in the accident.

"The Conception may have passed all Coast Guard inspections, but that did not make it safe. Our new recommendations will make these vessels safer, but there is no rule change that can replace human vigilance," said NTSB Chairman Robert L. Sumwalt.

The recommendations to the Coast Guard would apply to vessels, like the Conception, that are under 100 gross tons and have overnight accommodation for 49 or fewer passengers that fall under Subchapter T of federal marine regulations. The NTSB's recommendation on interconnected smoke detectors, meaning when one smoke detector alarms the remaining detectors also alarm, also would apply to larger Subchapter K vessels.

The NTSB also reiterated its call for small passenger vessels to be required to implement a safety management system to improve the safety culture of vessel owners and operators.

Probable causes

- During the virtual board meeting, the NTSB determined the probable cause of the fire and subsequent sinking was the failure of Truth Aquatics, Inc., the owner and operator of Conception, to provide effective oversight of its vessel and crewmember operations, including requirements to ensure that a roving patrol was maintained, which allowed a fire of unknown cause to grow, undetected, in the vicinity of the aft salon on the main deck.
- Contributing to the undetected growth of the fire was the lack of a Coast Guard regulatory requirement for smoke detection in all accommodation spaces.
- Contributing to the high loss of life were the inadequate emergency escape arrangements from the vessel's bunkroom, as both exited into a compartment that was engulfed in fire, thereby preventing escape.

REPORT bites

China has broken its record for the deepest manned dive into the world's oceans, sinking to an estimated 10,909 metres (35,790 feet) into the Mariana Trench, state-run news agency Xinhua said.

Canada is investing $9.4 million in four tidal energy projects that will bring clean energy technologies to the Atlantic region.

The failure to agree crew changes has not only been a stain on the global maritime community and institutions, but it poses a risk to global supply chains tweeted Nus Ghani MP.

Suzuki Motor Corporation has developed what's said to be the world's first Micro-Plastic Collecting Device for installation on outboard motors.

"What happened in Beirut made us examine our own situation and we actually got rid of large quantities of abandoned and neglected and dangerous materials that were in the ports," Mohamed Mait, Finance Minister, told the Egyptian parliament.

A new damage assessment following the devastating explosion in the port area of Beirut shows the blast caused between $3.8 and $4.6 billion in damage to infrastructure and physical stock.

"We had high hopes for the scrubber market in 2020, but Covid-19 changed all that," says Shyam Thapa, Yara Marine Innovation Manager. "Travel and distancing restrictions made it difficult to do business, and the resulting fall in oil prices weakened the scrubber case substantially."

IMO Secretary-General Kitack Lim said, "I would like to commend all those involved in the international efforts to support the Government of Mauritius and to mitigate the impact of the oil spill from the MV Wakashio."

Safety Briefings

NTSB RELEASES MASS OF EVIDENCE ON DEADLY CONCEPTION DIVE BOAT FIRE AHEAD OF FINAL HEARING

The National Transportation Safety Board (NTSB) has released a mass of documentary evidence and factual reporting on the deadly fire aboard the Conception dive boat on 2 September 2019, one of the worst tragedies of its kind in living memory. The docket's technical reports confirm that there was no assigned roving watch on the night of the fire, and they raise new questions about the level of safety training that the crew received before setting sail. The new material does not include any conclusions or recommendations, which will have to wait for the NTSB's final report; that document will be released after a hearing scheduled for 20 October.

In multiple witness interviews, former crewmembers told NTSB investigators that they did not recall a designated watch or roving patrol on board the Conception dive boat on prior voyages. Federal code requires that the operators of Subchapter T passenger boats (like Conception) maintain "a suitable number of watchmen in the vicinity of cabins or staterooms and on each deck" when at anchor.

The captain of another vessel in operator Truth Aquatics' fleet, the Vision, told NTSB that he believed that having one crewmember sleep in the same compartment as the passengers "somehow fulfilled" the federal requirement for a roving watch, because "the boat's been operating this way for so long successfully after so many [Coast Guard] inspections that it must be fine."

USCG marine inspectors told the Coast Guard that it is difficult to supervise operators' policies on roving watch when underway. In a records review, NTSB investigators found no indication that the Coast Guard has issued any citations for failure to post a night watch within the past three decades.

Training questions

Crewmembers also told the NTSB that new hires on the Conception dive boat received little training before heading out and that most training was conducted on the job. Three of the crewmembers – the second captain, first deckhand, and second galley hand – reported that they had never participated in a fire drill aboard the vessel, and the first deckhand said that he had never "done a dry run on anything, with the exception of during the Coast Guard inspections." Written logbook records for safety drills were maintained solely on board, according to the operator, and they did not survive the fire.

In addition, none of the crew members who were on board the Conception dive boat the night of the fire "were aware of any posted station bill," and the first galley hand "was unfamiliar with the concept of a station bill" when questioned by investigators, NTSB has reported.

COLREGS IMPLEMENTATION CALLED INTO QUESTION AFTER VESSELS COLLIDE REVEALS MCIB INVESTIGATION

Ireland's MCIB has published an investigation report on the collision between the tanker 'Varkan Ege' and the sailing vessel 'Medi Mode' in Irish waters during August 2019. The investigation attributed the incident to a mix of misunderstanding, inefficient lookout and poor knowledge of COLREGs.

There was neither injury nor pollution by this incident.

Probable causes
The cause of this collision is the result of two main factors:

1) The application and implementation, in this case, of the International Regulations for Preventing Collisions at Sea 1972 (COLREGs).
2) Human Factors.

Conclusions
The 'Medi Mode' believed that no risk of collision existed because the lights were green to green. However, due to yawing from a following wind they were actually showing a red, port side light to the 'Varkan Ege' when the lookout observed the vessel. Having taken no compass bearings and also that they had no radar, this could not be definitively determined.

Even though 'Medi Mode' saw the 'Varkan Ege' in plenty of time, it believed it was the stand on vessel and kept its course and speed in the belief that the 'Varkan Ege' would either alter course or would pass clear on their starboard side. This led to a close quarters situation and subsequent collision.

Meanwhile, the 'Varkan Ege' reported seeing the red light with a CPA of zero at 02.16 hrs and the collision occurred at 02.22 hrs. This gave it 6 minutes to take proper action to avoid collision. A lookout would have detected this at 4 minutes.

It had six minutes to make a large alteration of course to starboard, as it observed the 'Medi Mode' light at a range of 1.5 NM. A course alteration was made at 02.18 hrs, approximately 4 minutes before the collision.

As per COLREGs, the 'Varkan Ege' complied with efforts to avoid collision when it became apparent that collision was possible. It altered course to starboard, it reduced speed and requested 'Medi Mode' by sound signal to indicate its intentions.

The 'Varkan Ege' should not have attempted to communicate via VHF with the sailing vessel when it was so close. This is not recommended, and was not successful. This wasted valuable time when an immediate alteration of course to starboard may have been sufficient to avoid collision.

Recommendations
MCIB recommends Ireland's Minister for Transport, Tourism & Sport to issue a Marine Notice highlighting the requirements set out in Chapter 2 of the Code of Practice (CoP): The Safe Operation of Recreational Craft.

In particular attention should be drawn to:

- Chapter 2, para 2.1 of the CoP – Training: It is recommended that persons participating in sailboat and motorboat activities undertake appropriate training. A number of training schemes and approved courses are available and information can be obtained directly from course providers.
- Compliance with the International Regulations for Preventing Collisions at Sea (1972).

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

REPORT bites

Skeleton Technologies, a specialist in graphene-based ultra-capacitor energy storage, has partnered with the Karlsruhe Institute of Technology with the aim of completing the development of the SuperBattery, a groundbreaking graphene battery with a 15-second charging time.

A political reshuffle has resulted in Robert Courts becoming the UK's latest shipping and maritime minister for the Department of Transport.

Princess Yachts has been awarded a Princess Royal Training Award for its apprenticeship scheme.

A New Zealand court has fined the Ports of Auckland and one of its pilot a total of NZD $432,400 for excessive speeding during thousands of pilot boat voyages in Waitemata Harbour.

The volume of UK port freight tonnage for Q2 fell by 18% on last year at 96.1 million tonnes, according to statistics released by the Department for Transport.

By August 5th observers spotted some minor oil sheen around the vessel Wakashio after she grounded off the coast of Mauritius. The "the risk of oil spill was still low", the minister argued. How wrong he was.

"As we work towards the decarbonisation of the workboat sector, this latest innovation represents new gains in efficiency. In this way, we have been able to design a CTV that combines optimal performance in challenging conditions with a significantly reduced environmental impact," said John Cooper, CEO of BAR Technologies.

People in the Welsh village of Porthcawl recently awoke to the news that several large shipping containers full of tissues and incontinence pads could wash up on their beach after the loss of eleven 40-foot long containers from a cargo ship in the Bristol Channel.

Safety Briefings

MAIB ISSUES URGENT SAFETY BULLETIN ABOUT THE DEATH OF TWO MEN CAUSED BY CARBON MONOXIDE POISONING

On 4 December 2019 two men returned to 9.18m privately owned motor cruiser Diversion, which was moored on the river Ouse in York. The diesel fuelled heater had been leaking exhaust fumes into the boat's cabin while they were ashore, and both men were overcome by a high level of carbon monoxide gas and died shortly after they entered the boat's cabin.

Safety Issues

1) no carbon monoxide alarm was fitted;

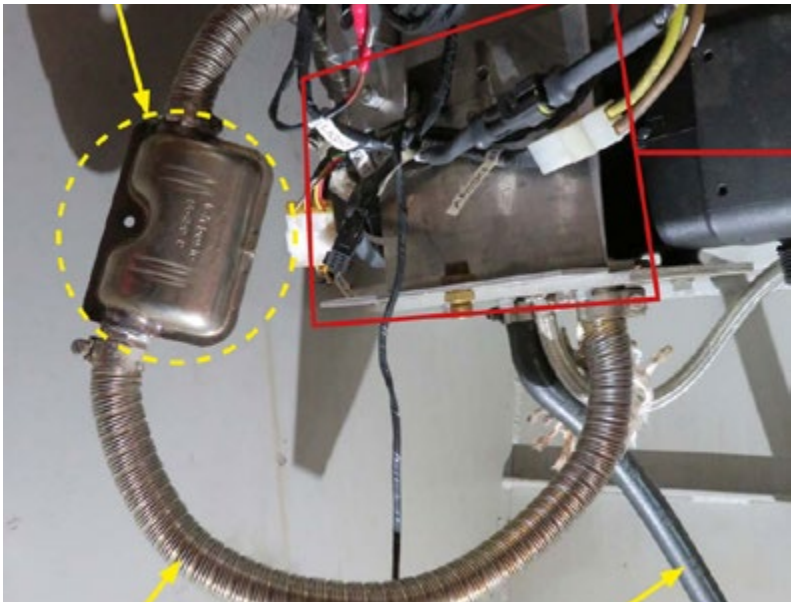
2) the cabin heater had been installed by the vessel's owner, but the installation had not been professionally checked and no servicing had been carried out.

This accident is still under investigation and the findings will be published by the MAIB in a full investigation report.

Statement from the Chief Inspector of Marine Accidents:
"The MAIB investigation into this tragic loss of lives once again highlights the importance of installing carbon monoxide alarms on boats with enclosed accommodation spaces. This is the fifth fatal marine accident investigated since 2014, where a functioning carbon monoxide alarm could have saved lives. Carbon monoxide alarms suitable for the marine environment are readily available, inexpensive and simple to fit, and I urge boat owners to invest in one as soon as possible.

"It is commonplace for marine engines, generators, cookers and heaters to produce carbon monoxide during normal operation; amateur installation and un-serviced appliances can introduce the risk of boat users inhaling lethal levels of this toxic gas. The importance of checking the installation and routine servicing of all such devices by a professional cannot be overstated."

Download the report at **https://bit.ly/37gy0Cv**.



NTSB ACCIDENT REPORT CONCLUDES THAT INCOMPLETE SAFETY PROCEDURES LED TO BARGE EXPLOSION

The National Transportation Safety Board (NTSB) has published Marine Accident Report 20-34 detailing the findings of its investigation involving the explosion of a barge at the Illinois Marine Towing Heritage Slip on the Chicago Ship and Sanitary Canal, Illinois on the 4 November 2019.

The barge explosion occurred when the IB1940 was being prepared for cleaning after its cargo of acetone had been unloaded. No injuries or pollution were reported in connection with the explosion. The barge, however, was declared a total constructive loss, valued at $1.75M.

In the report, NTSB says the probable cause of the explosion was incomplete procedures that did not incorporate the safety instructions included in the Illinois Marine Towing Facility Operations Manual for electrical bonding of air movers to barges.

The NTSB's investigation revealed that while Illinois Marine Towing had written guidance to workers for tasks related to barge cleaning operations before the explosion, the documents did not include all procedures identified in the Facility Operations Manual, specifically guidance for bonding air movers to the barge.

Following the accident, Illinois Marine Towing updated its standard operating procedure for liquid barge strip-and-blow cleanings to a 13-page document that includes instructions for stripping tanks, verifying that all residual product has been removed from tanks, inspecting air movers before leaving the shop, and ensuring the bonding strap is attached and tested for electrical continuity between the air mover horn and the bonding clamp.

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

LOSS OF TOWLINE SHACKLE PIN LED TO TUGBOAT MANGILAO SINKING REVEALS NTSB ACCIDENT REPORT

The loss of a towline shackle pin and deteriorated watertight fittings caused tugboat Mangilao to sink in the Pacific Ocean about 800 miles northwest of Guam, the National Transportation Safety Board (NTSB) has revealed in a Marine Accident Brief.

The 114 foot US flagged tugboat Mangilao sank on August 5, 2019 while being towed to a drydock in Subic Bay, Philippines by the 97 foot US flagged tug Chamorro. Both vessels were owned and operated by Cabras Marine Corporation. No one was aboard tugboat Mangilao and there were 10 crew members aboard the Chamorro.

No pollution nor injuries were reported in connection with the sinking. The 1982-built tugboat Mangilao, which was estimated to be worth $437,227, was not recovered.

A US Coast Guard marine inspector completed a dead ship movement inspection before the Chamorro's departure, and according to the marine inspector, a survey was conducted of the primary and emergency towing arrangements and verification that the exterior structure of the vessel was watertight.

In its analysis, the NTSB indicated that had the chain from the Mangilao's bow been longer and the shackle extended out beyond the bow fender, the chain, rather than the shackle, would have contacted to bow. This likely would have prevented the shackle pin securing mechanism (cotter pin) from failing, and the tow would have remained connected.

The NTSB determined the probable cause of the sinking of the Mangilao was the failure of the Chamorro's towing arrangement due to the loss of a towline shackle pin, which left the Mangilao adrift and resulted in the ingress of water from boarding seas in a developing typhoon.

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

With a spate of incidents and accidents what price human life at sea?

An opinion article by Mike Schwarz

The article you are about to read was written and published on the IIMS web site in September following a clutch of horrific marine incidents and accidents and has not been re-edited. Unbelievably, the shocking events referred to unfolded in the space of just six weeks.

Of course, we have always known that the sea can be and is a treacherous place at times; but the past few weeks have seen a spate of distressing incidents and accidents, seemingly occurring on an almost daily frequency and resulting in the loss of life with substantial damage to vessels and cargoes around the world. Before I became involved in my role as CEO of IIMS, I was blissfully unaware of the sheer number of lives lost at sea, as indeed are most members of the general public. The reason for that is simply that most marine accidents, apart from the really major ones, never make the general news agendas. When I tell my friends and family about the tragedies that routinely happen at sea, they are disbelieving.

The personal distress I have felt having seen details of one incident after another dropping into my inbox has compelled me to write a blog post if for no other reason than to remind people of what is happening around us. Our thoughts are so rightly wrapped up in the COVID-19 pandemic at the moment that it becomes easy to forget about the tragedies taking place elsewhere.

Sadly I have no solution or instant fix for what is going on and perhaps the current spike of fatalities I have alluded to is statistically nothing out of the ordinary, although for me it feels worse than whatever is deemed to be the 'acceptable norm'. Let's review the evidence.

The Wakashio incident off Mauritius has captured the attention of many – and rightly so. Why the vessel deviated from her course will not be known for some time, but the capsizing of a tug assisting in the cleanup operation with the loss of three crew was shocking news and sad to hear.

Last week, I learned that a cattle vessel with a cargo of 6,000 cows on board and 43 crew went down off Japan. The final time that the Master of the Gulf Livestock 1 spoke with his partner, Typhoon Maysak was lashing his ship. "He informed her that water had entered the ship. The last thing he said was he will go to the bridge to check the situation," Maya Addug-Sanchez, the captain's sister, told the Guardian newspaper. Addug's family hasn't heard from him since. To date, only three crew members have been found.

A tragic incident took place near Southampton when a 15 year old girl on a charter vessel ride died of her injuries when the rib she was onboard is reported to have hit a buoy.

The subject of enclosed spaces has been back in the news again recently with several more reported deaths. I can only presume people are not being properly trained or having been trained have become complacent or forgetful. No-one should be dying in such circumstances in my view.

In another recent incident, four crew members were recovered dead from the dredger Waymon L Boyd, after the vessel suffered a fire at the Port of Corpus Christi, Texas and at least 11 workers lost their lives in a shipyard in Vishakhapatnam in southern India when a huge crane collapsed during load testing.

As a sector, the shipping and boating industry is determined to look for ways to develop new products, new Apps, reduce emissions, (which is, of course, great for the environment), and even to drive remote surveying technologies. Does this latent wish to push technology to its boundaries, whilst desirable, mean we have taken our eye off the safety ball? In our collective desire to enhance technology have we forgotten about doing the basics well and lost sight of the importance of keeping people safe at sea? The current spate of incidents and accidents would suggest we might have.

A fire on an oil tanker, another on a container ship, a cargo ship colliding with a fishing vessel off Taiwan resulting in twelve missing and two confirmed dead and the death of a worker involved on routine maintenance operations compound what has been a miserable couple of weeks. Are safety standards slipping and being compromised, or is this just a 'bad run of luck'?

So, what are we to deduce from all of this carnage and tragedy? Well the MAIB in the UK is certainly busy as a result, launching several new investigations, as other national accident and investigation departments will be too. It serves as a reminder of the perils that lurk at sea. It also helps me to keep focused on the important role that the marine surveyor can be called to play at such times. It is in the darker moments that he or she often brings a range of expertise and skills to bear in the aftermath of such disasters.

As always, our thoughts are with the friends and families as they cope with the bereavement of a loved one.

THE SAD PASSING OF IIMS STALWART CAPTAIN BARRY THOMPSON

The world of marine surveying has been mourning the death of one of its most admired and respected practitioners of recent times with the passing of Captain Barry Thompson HonFIIMS. Barry, who died on 24 September 2020 aged 92 years old, was one of our oldest members and will be known to many people, both in the Institute and in the wider marine world.

IIMS CEO, Mike Schwarz, remembers a much-admired and skilful marine surveyor.

I cannot claim to have known Barry closely, nor indeed for very long - only the past 6 years. But what I learnt immediately upon joining IIMS was the high esteem in which Barry was held by fellow Institute members around the world, the board and, in particular, our members in New Zealand. He reached out to me early in my tenure as CEO and offered unconditional support and was most generous in his words of wisdom and encouragement. From then onwards, Barry and I would communicate often, and we struck up an instant accord and friendship with each other, despite our different backgrounds. Indeed, when I approached him with the concept of publishing a series of handy guides authored by surveying experts, not only was he enthusiastic about the project, but put his name forward as a potential author. He went on to write four handy guides, all of which continue to sell consistently well.

I always looked forward to seeing Barry and he made the effort to come back to the UK as often as he could before his health started to fail. He enjoyed visiting the Institute's head office and looking at the books in our library. I would treat him to lunch each time he visited at the local pub and his request was always the same - "ham, egg and chips please." After lunch, he would head straight down to the library in the Historic Dockyard in Portsmouth, just a ten-minute car journey away, to undertake research for his next book. Indeed, Barry liked to write and was good at it too. Apart from IIMS handy guides, Barry wrote other books, one of which was Deeds Not Words about the Coastguard, and another called All Hands and the Cook about sailors' slang expressions.

I recall the IIMS Silver Jubilee Awards in 2016. Barry cadged a lift and travelled up with the rest of the IIMS team by luxury coach from Portchester to London. We chatted away about something and nothing to pass the time. He had been nominated in the Outstanding Contribution to the Commercial Ship Marine Surveying Industry Award category. His nomination extract read, "Barry has been a stalwart member of our Institute since the early inception of the IIMS over many years. Despite being in one of the remotest outposts of the IIMS empire, Barry has continuously supported the organisation and was the founder and chairman of our first overseas branch in New Zealand. Barry gained immense respect with the New Zealand Government maritime department. Through Barry's sage advices he became an adviser to the department enabling them to draft national standards and protocols. He is a Master Mariner, consummate diplomat, author of various books and other journals and manuals and various technical papers." Needless to say, Barry won the Award and it was richly deserved too. It was an honour to present it to him alongside Sir Alan Massey, the then CEO of the Maritime & Coastguard Agency.

My lasting memories of Barry are that he was a thoroughly decent human being, a courtesy man with an encyclopaedic knowledge of aspects of the marine surveying profession in which he specialised and I always felt easy in his company.

Captain Barry Thompson leaves a lasting legacy and will be missed by all who knew him. Rest in peace Barry.

Mike Schwarz

Barry's career in brief

Brought up with a love of the sea and some experience in small boats in the South of England, Barry Thompson embarked upon a career at sea, serving his apprenticeship with Port Line. After obtaining his Second Mate's certificate he joined P&O, leaving after brief periods as Staff Captain and in command, to settle in Auckland, New Zealand.

He became a marine surveyor, shortly afterwards running his own business and was later appointed the Auckland Lloyd's Agent and a consultant surveyor retained by the Salvage Association. Retiring in due course from full time employment Barry became a Marine Consultant to the insurance and shipping industries in New Zealand. He was, for a time, Deputy Chairman of the NZ Committee of Lloyd's Register of Shipping.

Barry was a Liveryman of the Honourable Company of Master Mariners and a Fellow of the Nautical Institute. Since 2000 he has contributed several units to the IIMS Diploma Courses and is the author of the well-established textbook Surveying Marine Damage published by Witherbys and now in its 3rd edition.

Barry was awarded an IIMS Honorary Fellowship in June 2010. The Barry Thompson Scholarship was subsequently established and James Newcombe, based in New Zealand, became the first and to date only student to win the scholarship.

Barry was the inaugural Regional Director of the IIMS New Zealand Branch, the first overseas branch opened up by the Institute a number of years ago and his efforts are well documented.

Writing from New Zealand, his close friend and colleague Mike Austin said, "Barry was at sea in the merchant navy as an officer and gentleman before coming to New Zealand and settling down in St Heliers with his wife Diana who was a nurse and in due course their two children Kate and Sara. He became a Marine Surveyor in 1964 as a partner in Thompson Whiston & Co. then formed his own company Thompson Marine in 1968. He had a marine shop with the business in St Heliers, in a premises that was previously the Eastern Suburbs Bus service. It had a concrete floor and high ceilings and was shared with a squash court. He joined forces with Mike Austin in 1974. Barry was a longstanding member of the Maritime Law Association, and he and Mike (together with many of their staff) attended the early MLA conferences that were held at Tokanau, and have been to nearly every annual conference since. They considered it the best meeting ground for folk involved in marine law, shipping, ports, marine insurance, etc. Barry was asked to act as arbitrator on occasions and became a member of the Association.

Barry was a member of the New Zealand Royal Navy Reserve, a member of Rotary, a member and subsequently president of the Coastguard, and in 1972 a founder and original board member of the Spirit of Adventure Trust where he sailed as Master and was closely involved with sail training in New Zealand and around the world, and was one of their Vice Patrons.

Barry also had a well-known enthusiasm for heraldry – it was important to get flags right he always said!

In 1980 Thompson Marine became the Lloyds Agents and that continues to this day. In 1986 the firm joined MBS Loss Adjusters that has morphed with changing owners over the years to Sedgwick. Barry retired in 1991 to become a consultant, and also to author his book Surveying Marine Damage that was first published by Witherby in 1994 and is now in its third edition, published in 2016.

Captain Thompson leaves a lasting legacy. The New Zealand marine industry and our Association is all the better for his contribution and it was a privilege to know him.

Fond memories from others who knew Barry.

Mike Wall said, "I am honoured to have had Barry as my friend and mentor. He reviewed most of my books and wrote the foreword to 'Report Writing for Marine Surveyors'. He was a courteous, kind gentleman and very knowledgeable. Whilst diminutive in stature he was a giant of the marine surveying world. He will be greatly missed by all who knew him."

Peter Morgan commented, "Barry was a nice man and stalwart of the IIMS and will be missed."

An unknown author said, "You always wanted him (Barry) on your side as an expert in a court case, but if he was on the other side at least you knew he would always give his evidence fairly."

IIMS Past President, Capt Zarir Irani, commented, "Captain Barry Thompson will not be forgotten by us here at the UAE branch as he was instrumental in guiding this branch set up. I personally knew him from his passion to promote IIMS far and wide. RIP great man. You are in our prayers."

"Capt Barry had contributed significantly in each area of marine surveying. May god give strength to his family to bear this loss and maritime world will always remain indebted to all his contributions. RIP," Ashish Baghel wrote.

From France came this tribute from Capt Phil Duffy who said, "I remember fondly spending the evening with Barry at the 2016 London Conference, he was very witty and full of old yarns, and his book Surveying Marine Damage has always taking pride of place on my bookshelf. He will be sadly missed. RIP."

Milind Tambe said, "This is such sad news, and my prayers are for him. He will ways be remembered. I met him first at Sydney and later a few times at London. His was one powerhouse of knowledge. May his soul rest in peace."

Chris Ollivier wrote, "Barry Thompson was my boss and mentor changing my life in the early 80's leading me into marine surveying for 20 years. Probably one of the most influential people in my life. Thank you Barry, RIP."

"A true giant of our profession. Our best wishes and thoughts are with his family at this sad time from all of his IIMS family in Australia and New Zealand," remarked Adam Brancher.

JAMES HALE APPOINTED TO BSI COMMITTEE AS IIMS REPRESENTATIVE

Following the retirement of Past President, Peter Morgan, who was the IIMS representative on the SME/32 'Ships and Marine Technology' BSI (British Standards Institute) committee, James Hale has been appointed as his replacement to represent the Institute.

This is BSI's mission:

'Our purpose is to inspire trust for a more resilient world. Our solutions and services improve performance and support the United Nations Sustainable Development Goals. At BSI, our mission is to share knowledge, innovation and best practice to help people and organizations make excellence a habit. This is underpinned by our role as the national standards body and through our prestigious Royal Charter'.

This is the situation the BSI committee wants to avoid:

'What bloody idiot wrote that? There is no way I can survey that as intended'.

And this is the desired outcome that BSI seeks:

'This is a meaningful standard that helps manufacturers meet the regulations and is easy to survey and certificate during build and operation so that the owner can be confident in its performance'.

RECENT NEW IIMS MEMBERS

Full members		
Mike Tweedie	*MIIMS*	Australia
Steve Kwon	*MIIMS*	South Korea
Mohammad Moinuddin	*MIIMS*	Bangladesh
Nooruddin Bargir	*MIIMS*	India
Louis Trejo	*MIIMS*	Mexico
Keith Ramsay	*MIIMS*	UK
Harry Guiang	*MIIMS*	Honolulu
Robert Scanlan	*MIIMS*	USA
Daniel Szaloky	*MIIMS*	Hungary
Claudio Santellanes	*MIIMS*	Colombia
Lee Wilkes	*MIIMS*	UK
Sajith Marakkar	*MIIMS*	UAE
Technician members		
Paul Forster	*TechIIMS*	UK
Oliver MacManus	*TechIIMS*	UK
Corporate members		
Intrass Ltd	*CorpIIMS*	Nigeria
Associate members		
John Sharratt	*AssocIIMS*	UK
Mike Willie	*AssocIIMS*	Maylasia
Ross Naylor	*AssocIIMS*	Australia
Martin Patten	*AssocIIMS*	UK
Affiliate members		
Emiliano Michelotti	*AffiliIMS*	Italy
Nnamdi Hilary Ugwuoke	*AffiliIMS*	Nigeria
Justin Gorddard	*AffiliIMS*	Australia
Timothy Warren	*AffiliIMS*	Australia
Joe Pate	*AffiliIMS*	UK
Paul Stock	*AffiliIMS*	New Zealand
Derek Payne	*AffiliIMS*	UK
Paul Bullen	*AffiliIMS*	UK
Pavel Martyushev	*AffiliIMS*	New Zealand
Alexander Damaskinos	*AffiliIMS*	Cyprus
Stephen Eiszele	*AffiliIMS*	Australia
Eurico Teodoro	*AffiliIMS*	Portugal
Dario Farabegoli	*AffiliIMS*	Italy
Ryan Ennels	*AffiliIMS*	Germany
Graduate members		
David Jack	*GradIIMS*	Scotland
Robert Peever	*GradIIMS*	Canada

IIMS congratulates the students who have completed their studies:
IIMS Professional Qualification in Yacht and Small Craft Marine Surveying
David Jack Robert Peever

IIMS SET TO CHANGE ITS CERTIFYING AUTHORITY TRAINING STRATEGY

For many years, the IIMS Certifying Authority (CA) has pursued a rigid training policy, requiring an examiner to attend one of the two days real time training that have been arranged annually in spring and autumn. This concept now seems somewhat outdated and inflexible. Furthermore, asking an examiner whose specialism is coding motorboats to sit through a presentation on workboats and cranes at a training day is not a great use of anyone's time, unless it has direct relevance of course!

It has always been a requirement as part of the Institute's contract with the Maritime & Coastguard Agency (MCA) that our coding examiners are continually assessed, which includes attending training. And at MCA audit the CA is asked to provide evidence that this has happened.

The new look CA training strategy aims to be more targeted toward various specific aspects of the Codes. So instead of full days of training covering a variety of topics, the IIMS CA is planning a series of succinct, tailored presentations that last for a much shorter time for a modest fee, all broadcast via Zoom. It is expected that coding examiners will have attended two training sessions in one full calendar year. A series of training dates for 2021 will be published in the coming weeks.

THE USE OF DESIGNATED POST NOMINAL LETTERS AFTER YOUR NAME

IIMS would like to remind you to use the correct designated post nominal letters after your name, depending on your membership grade, at all times when making reference to your membership of the Institute following some recent confusion.

As reminder, the post nominals may be used on websites, email footers, business cards and so on as follows:

Technician members may use ***TechIIMS***

Affiliate members may use ***AffiliIMS***

Full members may use ***MIIMS***

Associate members may use ***AssocIIMS***

Fellows may use ***FIIMS***

WHAT HAPPENS TO THE VALUABLE NEW MURRILLS HOUSE ASSET IN THE EVENT THE INSTITUTE IS WOUND UP IN THE FUTURE?

Upon completion of the acquisition of Murrills House as the Institute's new headquarters, the IIMS management board had reason to check the constitution closely at a recent meeting when the subject was discussed as to what would happen to this valuable new asset in the event that IIMS was dissolved at some point in the future.

So after a few minutes of rifling through the constitution, Article 10 was discovered which clarified the matter once and for all and for the benefit of members, it reads as follows:

Article 10
Dissolution of the Institute
The Institute can only be dissolved by a decision taken by a three-quarter majority of those present or represented members, by an Extraordinary General Meeting convened for this purpose.

Notification of this meeting must be made individually. At the same time that the General Meeting pronounces the dissolution by a majority of present or represented members, it designates two liquidators who are responsible for the liquidation of the property of the Institute.

The funds representing the net assets of the Institute at its dissolution must be allocated to one or more charitable organisations for the welfare of mariners decided at the meeting by the majority of its present or represented members.

And here are the latest developments with Murrills House. Some of the essential work that did not require council planning permission has been completed to satisfaction. This includes treating infestation in the roof space, adding new insulation in the loft and replacing some damaged roof slates. The work to replace most of the rotten windows and repair the front door requires formal planning approval from the local authority and the application has been made and accepted recently.

This is also the matter of what was a very large, old cluster of five trees to the front of the building, which visitors to Murrills House could not have failed to notice! These have been tackled in a fairly delicate operation by tree surgeons with the result that one huge sycamore has gone, uncovering the remaining more handsome French oak that has been trimmed back to a manageable height.

IIMS HAS RELEASED TWO FREE GUIDES AVAILABLE TO DOWNLOAD IN PDF FORMAT

Last month IIMS published a new free 36-page informative guide called 'The use of moisture meters on small craft'. Additionally, the Institute has made available another free 16-page guide entitled 'Biological Attack on Iron & Steel'.

Both guides, authored by Jeffrey Casciani-Wood HonFIIMS, are available in pdf format from the IIMS website.

The use of moisture meters on small craft

The first thing to know about moisture meters is that they do not actually measure moisture. What they do measure is conductivity. The origins of the moisture meter lie in the building and construction industries and the original scale was based on the water content of brick and stonework. The scale has largely remained unchanged. There are a number of these machines available in the market and they were first introduced into the marine industry for checking how an frp hull had dried over time prior to rebuilding for osmosis treatment and for that they remain a useful tool. They are also used to check for moisture below a surface that looks dry.

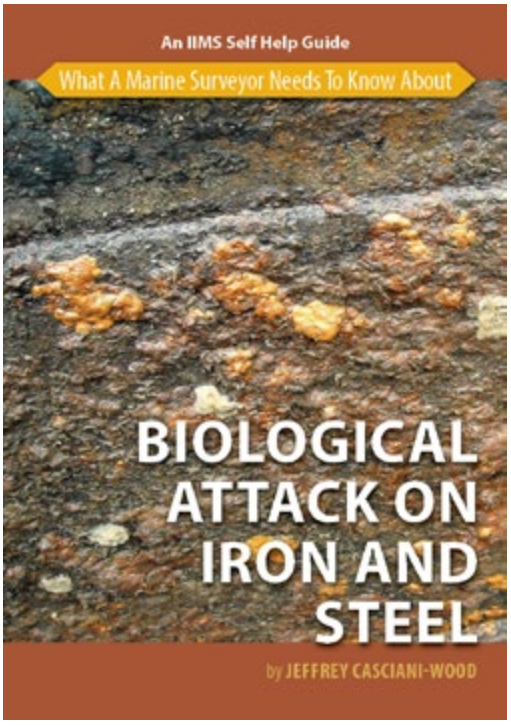
Electrical moisture meters have an enormous advantage for the general survey as they are clean and nondestructive, but they do have limitations and they do NOT quantitatively measure moisture on/in hull substrates. The majority record electrical resistance between two applied electrodes or capacitance and, more recently, some measure the reflection of radio frequency emissions from the meter.

Biological Attack on Iron & Steel

Boat owners and marine surveyors will be familiar with common iron rust whatever form is takes. The literature on the subject of electrochemical or galvanic corrosion is enormous. However, although the phenomenon is well known to the mining and oil industries where it causes millions of dollars' worth of damage annually, biological attack is not so widely understood in the marine world.

Macrobiological attack is the phenomenon of mussels, barnacles, slimes, grasses and seaweeds attaching to a vessel hull. These items do not usually cause serious harm to the metal but they can and do slow the boat down and increase the fuel consumption. However, there is a different kind of corrosion which is also found on boat hulls, particularly those lying in water such as canals or rivers containing decaying vegetable matter. Few people are aware of the problem or realise it is caused by microbiological attack, or metal worm.

Metal worm is a highly unpredictable process but the marine surveyor should realise that, under the influence of microorganisms, corrosion processes can happen in a matter of months compared to the years it would take for ordinary abiotic corrosion to reach serious proportions.



Both pdf guides can be downloaded at **https://bit.ly/2HC1i3A**.

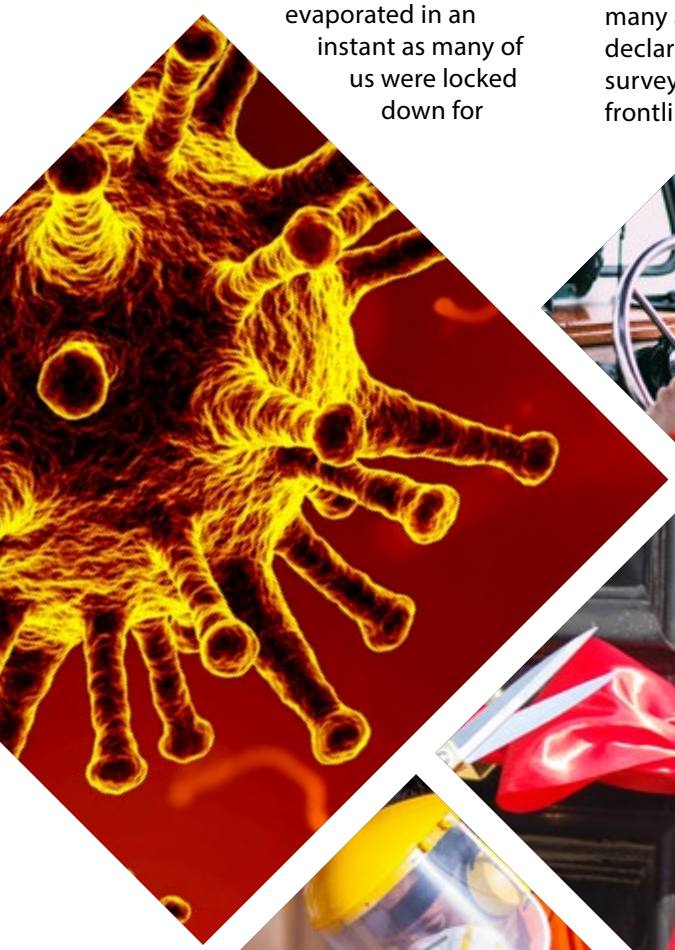
2020 REVIEW:

The year that changed the marine surveying landscape and challenged what we once took for granted

IIMS Chief Executive Officer, Mike Schwarz, casts his mind back over what has been an extraordinary year unlike any other most can remember...

I am sure I can say with a degree of certainty that for many of us, our annual routines generally follow something of a familiar pattern - mine certainly do. We take five weeks' vacation (if we are lucky) perhaps, many of us celebrate special holidays and birthdays with loved ones in our extended families, we routinely engage in sporting and other leisure activities and hobbies, hop on and off planes at will, and we relax with friends and colleagues at the end of our working days with a beer of glass of wine. Well that's how it used to be!

2020 has challenged and changed all that. No-one saw COVID-19 on the horizon until it was too late and the world has been caught unprepared. That world and existence we knew evaporated in an instant as many of us were locked down for weeks as the worst pandemic since Spanish flu a century ago took hold. At the time of writing, the UK is back in lockdown again for four weeks, France is totally locked down, Germany the same, Sweden is reviewing its policy due to a worrying spike and so it goes on. The pandemic has had a profound effect and will leave lasting effects and, for some, painful memories. On the downside, good, well established businesses in the marine world have already gone bankrupt and others will follow sadly. But there has been a positive side too for some, IIMS included. Many yacht and small craft marine surveyors around the globe have never been busier - they tell me - and have been literally rushed off their feet working seven days a week to meet demand as the public has gone boat buying crazy. In some cases, people are buying boats unseen based on the surveyor's report. What a conundrum and unexpected development! It has helped that many authorities around the world declared and recognised marine surveyors and ship inspectors as frontline or key workers too.



GENERAL OVERVIEW

And what of IIMS in all this chaos and disruption? I have never managed a business through a pandemic; indeed, few will have done and it has certainly presented a number of key challenges which have never appeared in any strategy plan or risk assessment I have been involved with. Similarly, there is no guidebook written that explains on page 37 how to deal with COVID-19, so I have had to make it up as I have gone along with the help and unstinting support of my colleagues. The feeling and depth of uncertainty and fear at the start was intense and hard to fathom in late February. Daily UK government and international briefings got gloomier and the number of infections and deaths in the UK and elsewhere rose rapidly. Although the direction of travel was quickly becoming apparent, I did not for one moment think governments around the world would choose to impose total shutdowns because of what it would do to their respective economies. How wrong was I?

We discussed things internally as a team and considered the possibility of having to work from home. That would have been impossible to do a couple of years' ago, but our recent move to a cloud-based solution using Office 365, OneDrive and SharePoint, thus becoming paperless made it manageable. Foremost in the back of my mind was we must do all we could to

keep our staff safe and protected from the pandemic. I then started to think about the potential risks to the business and considered how IIMS could keep revenue streams strong and moving, especially as we were closing in on the purchase of Murrills House. Should we continue with that expensive acquisition or abandon it and stockpile our cash reserves for bad times ahead? These were tough decisions to make. In the end the decision about home working was swiftly made for us when the UK government locked us down in late March; and so began the strangest working environment I have ever experienced that lasted for three months. On the plus side, the weather was exceptional – day after day of warm sunshine. So, once the work was done, those lucky enough to have a garden could get some fresh air.

I was in constant touch with the management board to keep them abreast of what was happening. I had made the decision to keep the whole team fully employed, despite the generous government furlough scheme that was unveiled to guarantee 80% of employees' salaries, designed to keep people in employment. Hindsight is a wonderful thing, but as I look back now it was absolutely the right decision. Many of our fellow Institutes and Associations all but mothballed their operations for a period of time.

Cancelling our regular annual face to face events, such as Palma and Baltimore, was miserable. But out of that grew a series of online presentations - fourteen in total - that seemed to capture the imagination of members, some of which attracted an online audience of 100 plus delegates.

The result as I look back and reflect is that we have had a progressive year given the threats and hurdles the pandemic has put in our way. There are too many achievements for me to list them all, but if I can just mention the two most important it would be 1) survival, keeping the whole team employed and being ahead of budget 2) acquiring the freehold of Murrills House for the members. The Institute has performed strongly and is financially sound as we reach the end of 2020.

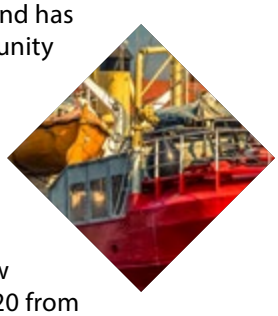
EDUCATION

One of the reasons for a strong financial outcome this year has been the exceptional performance of the two award-winning IIMS distance learning Professional Qualifications and Diplomas in Large Yacht & Small Craft and Cargo & Commercial Ship marine surveying. Each quarterly intake has exceeded budget and there are 200+ students currently enrolled in the programme.

In the next couple of weeks, we are about to deliver our first seven-day practical course (COVID-19 pandemic lockdown permitting) for a group of six small craft students which will take place at the Lyme Regis Boat Building Academy in Dorset, UK. This is a significant step and adds a practical element to the course. Delegates will gain hands-on experience of how to work with wood and GRP (in a COVID secure environment). The course will count as one of the four specialist modules required to complete the Diploma. If it is successful, IIMS hopes this will become an annual opportunity for students.

Undoubtedly one of the toughest challenges we face is keeping the thirty plus modules current and up to date. It is a big job! This year we have invested time and money, working with the module authors and tutors, to update several of the units. This includes refreshing content because of technological developments, legislative changes, and the addition of new student resources.

We have also continued to work hard to enhance the student experience remembering that most of them study in isolation. This has been a positive activity and welcome development much appreciated by all. After each quarterly intake we hold an online 'freshers' session. This gives those joining the programme to hear directly from tutors what they expect and how they should approach their studies and assignment compilation. Furthermore, we have organised half a dozen meet the tutor sessions where one specific module is explored, and the subject discussed in detail. These have been well attended by students and has given them the opportunity to ask questions.



MEMBERSHIP

The Institute has had a record number of new applications during 2020 from countries around the world. In the past 12 months, we have doubled the number of new membership applications on the previous year. I have my theories as to why this might be, chief amongst them is the extensive and aggressive below the line digital marketing we have conducted over the past 18 months (more on that later), which seems to be bearing fruit. The other reason could be that we have made the process of applying much easier with the introduction of a simple and effective online form to replace the cumbersome word document that preceded it.

Growing any membership organisation in this age is tough. But one of my goals has always been to say that the number of members has passed the 1,000

mark. As I write, we are perilously close to it and once the applications that are being processed currently are sorted, I hope to be able to tell you we have surpassed it! And that feels like a significant milestone.

The surge in new membership applications necessitated adding some new surveyors to the Professional Assessment Committee (PAC) which we have successfully achieved. The PAC has met a couple of times this year. The big piece of work that has been undertaken by the committee is the review of surveyor specialisations. That process is ongoing and our aim is to connect and engage with every member to ensure that individual specialisms are correct. It is many years since we reviewed the available categories and many new specialisms have been added. We want this to be a positive experience for members, but I would remind you that whilst we are happy to consider adding new experiences at no charge, the person making the application must be able to back up their claim with objective evidence of their skills in that particular area.

It is about this time of year that we send out the annual membership invoices and, if you have already received yours, I hope you will notice it is the same as last year. Members voted at the AGM in June to keep the membership fees at the same level. I believe the fees continue to provide excellent value for money as the resources the Institute offers continue to grow.

It is worth commenting briefly on the value of the IIMS network of members, which is really coming into its own during the pandemic. A number of members have told me they are increasingly reaching out to other members to help when they receive an enquiry but are unable to travel or fulfil the requirement themselves. This I find is a very positive thing indeed and in these troubled times, the IIMS surveying family and community should stick together and make use of the international network.

CERTIFYING AUTHORITY

The most challenging part of the business this year in revenue terms has been the Certifying Authority (CA). The IIMS CA is a small player in terms of the total UK fleet of commercially coded vessels with less than 300 vessels. Put bluntly, our revenues went off a cliff edge in April and May as the pandemic set in and the effects were felt. Commercial operators, in many cases, suddenly had no passengers or demand for their vessels. Inevitably this led to the lapsation of certificates and examinations. Whilst there has been a recovery, the ongoing uncertainty in the charter and commercial sector means this area remains a threat well into 2021. I am grateful that it is only a small part of the Institute's revenue stream and I certainly have concerns for other UK Authorities who have far larger fleets and are therefore more financially exposed.

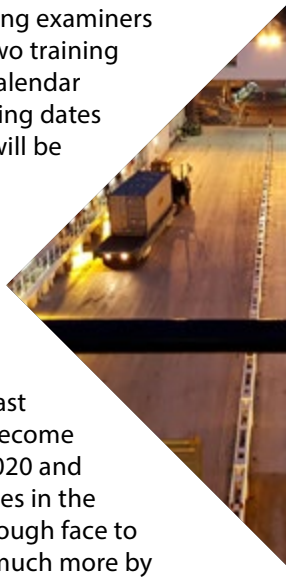
IIMS has been leading the work to develop a certification scheme for coding examiners in association with all other CAs, developing a common standard for those who carry out this work. This was well advanced when COVID-19 appeared, and we have had to park the programme for the time being until calmer waters lie ahead. But we remain committed to developing and rolling out this scheme when it is appropriate so to do.

This year we have welcomed four new coding examiners into the CA. Each individual is subject to an in depth and searching interview with two of the committee before being accepted.

In recent weeks, we have reassessed how we train coding examiners. For many years, we pursued a rigid training policy, requiring an examiner to attend one of the two days real-time training that has been arranged annually. This concept now seems somewhat outdated and inflexible. Furthermore, asking an examiner whose specialism is coding motorboats to sit through a presentation on workboats and cranes at a training day is not a great use of anyone's time, unless it has direct relevance of course!

It has always been a requirement as part of the CA's contract with the Maritime & Coastguard Agency (MCA) that our coding examiners are continually assessed, which includes attending training. And at MCA audit the CA is asked to provide evidence that this has happened.

The new-look CA training strategy aims to be more targeted towards various specific aspects of the Codes. So instead of full days of training covering a variety of topics, the CA is planning a series of succinct, tailored presentations that last for a much shorter time for a modest fee, all broadcast via Zoom whilst the pandemic continues. It is expected that coding examiners will have attended two training sessions in one full calendar year. A series of training dates and topics for 2021 will be published soon.



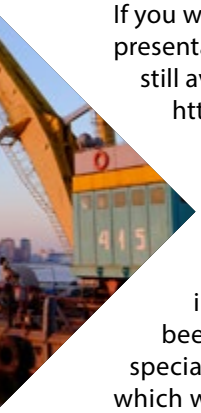
ONLINE SEMINARS

Making the most of the ability to broadcast training online has become a strong feature in 2020 and how I wish I had shares in the Zoom platform! Although face to face meetings offer much more by way of networking opportunities, worldwide events have changed the landscape.

In early March we ramped up our plan to deliver a series of specialist seminars on specific areas of marine surveying, each presented by someone knowledgeable in their subject. Over the coming months, we organised and delivered fourteen sessions, some of which were very memorable, and we were rewarded for our initiative by some strong attendances.

Three seminars attracted over one hundred delegates, the two most successful in terms of numbers being Surveying Rigs and Masts by Kim Skov-Nielsen and Surveying and Inspecting Small Craft Engines by Geoff Waddington. My thanks to all those who participated and took the opportunity to refresh their skills and pick up some new ones.

If you want to review the series of presentations run by IIMS, they are still available and can be found at https://bit.ly/2Ssv6Td.

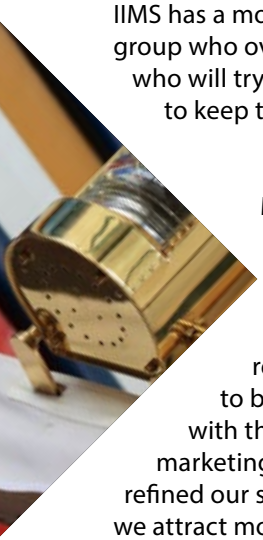


WHATSAPP GROUPS

One of the new innovations in 2020 has been the establishing of specialist WhatsApp groups, which we have managed with varying success. The UK inland waterways group was the first to come on stream. The group has less than 20 members, which is perfect as it means the group is connected by a common specialist surveying discipline.

We have since established a group for members in Nigeria and other groups for existing and new students. More are set to follow.

IIMS has a moderator for each group who oversees 'fair play' and who will try to stimulate debate to keep the group active.



MARKETING

The innovative marketing that IIMS has deployed in recent years continues to bear fruit. However, with the help of our marketing specialists, we have refined our search which means we attract more response from relevant individuals for less financial investment.

Our digital platform targets are LinkedIn, Facebook and soon YouTube is to be added.

The marketing initiatives produce many leads from potential students and new members each day. There will be no let-up of this activity in 2021!

COMMUNICATIONS & SOCIAL MEDIA

We have continued to be very active in our communication channels over the year. The monthly news bulletin has published on the first of each month and is widely read. As well as IIMS member news, we have broken and shared some important industry news stories from time to time.

The website attracts on average 15,000 unique visitors a month and remains the primary source of marine surveying news and resources on the internet. We have continued to build the online Safety Briefings resource on the site which is now home to many hundreds of incident and accident reports that can be freely accessed. To the best of my knowledge this is a unique resource.

In the past couple of months, we had added a tracker to the website which gives us data about which pdfs are downloaded and how many times. It gives a fascinating overview into which content is accessed. In just six weeks over 2,000 pdfs have been downloaded.

Our social media sites continue to attract followers. LinkedIn, in particular, has blossomed and over 6,000 are now following the Institute.

The content on the YouTube channel now boasts over 230 original videos and has over 800 followers.

BRANCHES

Generally, branch activity has been quiet in 2020 for obvious reasons. The biggest casualty was the 10th Indian Branch celebratory conference, scheduled for November. This was cancelled and a new date will be found at an appropriate time.

Prior to lockdown, we managed to get two successful overseas events away. The annual Conference in Baltimore was a great success. Organised by James Renn, he had assembled an impressive array of speakers which attracted a record number of attendees.

Just a few short weeks later in early March, the first IIMS Canada Branch Conference was organised in Vancouver. This two-day seminar attracted about 40 delegates and my thanks go to Sarah White and her other branch colleagues, for getting a great event together. I had the absolute pleasure of meeting Stan Bowles, a long standing IIMS tutor, module author and marker. I presented him with an Honorary Membership, which certainly surprised him, and it was a pleasure to see the look on his face as he graciously accepted the recognition and accolade.

The efforts of the UAE branch are worthy of a special mention. At the height of the lockdown, they ran several online seminars on a range of shipping topics, one of which remarkably attracted an audience of more than 400.

MARINE SURVEYING ACADEMY UPDATE

COVID-19 has presented rather more tough challenges for the MSA team to handle. The IRMII (International Registered Marine Insulation Inspectors) and RMCI (Registered Marine Coatings Inspector) standards have been dormant since March, both of which have been historically delivered

as face to face programmes. This presented an immediate challenge with no obvious solution. Whilst it is unlikely that IRMII will reactivate any time soon, progress is being made to transform the RMCI standard into a five day online only course, to include a timed online examination. I am expecting news on this development soon and hope we can roll it out to the superyacht coatings industry early in 2021 without any loss in value or integrity of the course.

The eCMID Accredited Vessel Inspector scheme, managed by MSA on behalf of the International Marine Contractors Association, has had a progressive year, despite the pandemic. It has certainly made the inspecting and auditing of offshore assets considerably harder. Enhanced PPE has been essential, a more stringent approach to risk assessments required and just the challenge of getting on board a vessel has exercised some. Over 600 inspectors have come forward to be accredited since the scheme began more than five years ago. It has been a great success and our partnership with IMCA continues to grow and flourish.

INDUSTRY OVERVIEW AND DEVELOPMENTS

My views and opinion on the continuing high level of incidents, accidents and deaths at sea are well known. Indeed, I have authored a short piece on this subject for this issue. That so many people lose their lives needlessly, much of it caused by human error and machinery malfunction, rests heavy with me.

The drive for greener technologies in the boating and shipping sectors has accelerated it seems this year and I applaud the innovation that is happening in all areas of the maritime sector.

Having been involved in shows and exhibitions in a former career, I have been greatly saddened by the almost total wipe out of boat shows and shipping exhibitions. Whilst the attempts to recreate some of them as virtual events are to be praised, there is no comparison with the real thing. Seeing great events such as Seawork, METS, Posidonia - I could go on – falling by the wayside month after month has been depressing. Let's home for a prompt resumption of live events.

Remote surveys have surged in popularity during COVID-19. I wrote a feature article on this subject in the last Report Magazine. DNV GL has just recorded its 20,000th remote survey, so they are steaming ahead, as are other classification societies. But there are surveyors for and against. The debate will continue for months to come. However, the matter is a bit clearer in the small boat arena. Insurers I have spoken with in the UK are highly nervous about a vessel owner connecting with a surveyor to show him/her around the boat using video – effectively a virtual survey – expecting the surveyor to write a report on what he/she has been shown. The best advice I can give you on this one would seem to be don't!

We have played our part on the bigger stage this year, most notably in making a submission to the Australian Senate as part of their review into the performance of AMSA. IIMS' evidence was heavily referred to in the final report. We are currently engaged in addressing the rules and regulations surrounding UK narrowboats, which leave a bit to be desired in our opinion. More on that soon.

And finally…

At the end of each year I always take the opportunity to thank those at head office and the IIMS office holders for their work and support. This year I especially want to say a big thank you to the IIMS head office staff. They have done something extraordinary in keeping the Institute afloat during the toughest of circumstances imaginable, proving to themselves and to the team as a whole what a solid and effect business unit we are.

I must also thank all those who have given freely of their time to manage the various IIMS committees, attending meetings as and when. The online AGM reached new heights with over 100 registering to take part, suggesting that members are engaged. And our tutors, authors and markers for the two Professional Qualifications who have been busier than ever. Thank you.

I also have a special mention also for all those who have presented material at online seminars and a few in person too before lockdown set in; plus, those who have written for The Report Magazine during 2020.

As we reach the end of the year, my abiding memories of 2020 are mixed and conflicted. Death, carnage and disruption all round us, the like of which most will not have seen, caused by the worst pandemic the world has witnessed since Spanish flu, the personal loss of my father in mid lockdown that hit me hard, coupled with a most satisfying business year for the Institute and a productive year for many surveyors. It really has been the strangest of strange years.

Mike Schwarz

Chief Executive Officer

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How **COVID-19** has affected the role of the marine surveyor

The Report Magazine asked a number of IIMS members from various worldwide locations to give an overview on how COVID-19 has changed the surveying landscape this year. What emerges are certain similarities from country to country and, no matter if you are surveying motorboats, yachts, commercial vessels - and anything else in between - the pandemic has had a profound effect on the surveying profession, communication with clients and many aspects of how the surveyor conducts business.

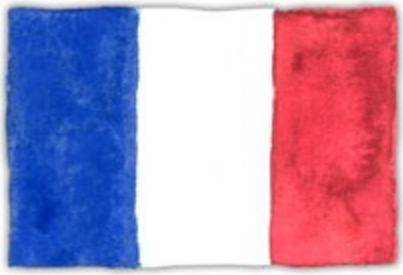
Mick Uberti, Director of Maritime Survey Australia commented, "COVID-19 has presented many challenges for us at Maritime Survey Australia (MSA). International Travel has stopped as the Australian Federal Government has made it difficult to travel and even harder to return as flight numbers are limited. While it is not impossible to travel internationally many clients have cancelled or delayed building a vessel which has a flow on effect.

Domestic travel has also been made difficult in Australia by the state governments imposing border closures and draconian measures for permitted workers to be able to cross borders. The measures have been put in place as Australia is trying to completely eradicate the virus.

These closures have had significant impact on national businesses, employers and employees who operate interstate. It remains unclear how long border control measures will remain in place, but it is predicted that closures will be in place for up to six months. We have had to consider alternate working arrangements to accommodate for these closures and to protect the health and safety of our surveyors.

We have developed a COVID-19 Safe Plan and have had to work closely with clients to manage the survey. Our surveyors have been encouraged to get tested if they show any symptoms - we log all of our movements so we can assist with contact tracing if possible. The use of sanitisers, and social distancing and working from home has become the norm like the rest of the world. In Victoria, wearing masks is mandatory to prevent the spread of COVID-19.

The situation does not appear to be getting better at the time of writing. Globally we have more than 35 million COVID-19 cases and more than a million deaths. While people are getting fatigued, I suspect the next 12 months will be much the same as it is now. We need to learn to live with the disease the best way we can. Even if we have a vaccine, the logistics of rolling this out will take years.



Phil Duffy, Interface Marine, is based in Grasse in southern France and reports, "In house we use PPE, including masks and gels while on-site in shipyards or onboard. We have all also been tested. Onboard most of the larger vessels over 24m, and certainly the commercial ones, have a COVID-19 protocol in place, including signing in to say that we have no symptoms and enforcement of PPE is in use; however, on smaller boats, it has become rare that anyone even uses a mask.

Travel within the EU by road is mostly unaffected and restrictions on visits to yards differ widely from yard to yard. Some of the smaller French and Italian yards are very lax with enforcing PPE, while several of the larger shipyards have a stricter approach.

We have had to adapt to the fact that many of our clients cannot visit the yacht or attend sea trials before making an offer, which has meant keeping lines of communication open, including real-time videos. The obvious risk is that when the client eventually sees his new purchase, he may be disappointed and lay the blame at the foot of the surveyor! So, the need for transparency and attention to detail is paramount.

As far as the next 12 months are concerned, I am optimistic that the market will continue to be buoyant over winter, but the knock-on effect of rising unemployment levels throughout Europe and the USA will begin to depress the market in Q1 2021, especially in the under 24m sector."

Operating out of Barcelona in Spain, **Roland Perry** says, "Here in Barcelona, a city of densely occupied small apartments, lockdown meant going out only to buy food. Some buildings here have communal roof terraces and gardens, but they too were shut. Police patrolled the empty streets, and surveyors fantasised about the good old days of inspecting black water tanks.

I calculated that walking up and down my hallway 297 times would simulate my normal exercise, and my 2-year-old son joined in enthusiastically. My wife observed calmly, and the people below didn't complain.

On release, my work diary was full. My first job was a six-hour drive away in France. I prepared the 11 pieces of paper required to prove my profession, reason for travel, work contract, permission to enter, permission to move, and so on, only to be denied entry at the border. The officers eventually let me pass after I told them the truth: a commercial vessel was awaiting my visit before it could move.

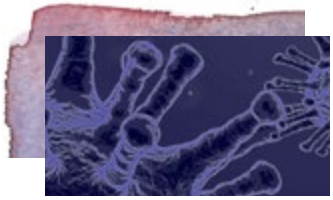
As hotels and restaurants were closed, the client had arranged a bed for me on a neighbouring boat. The owner informed me that I could use the bed, but not the bathroom or galley - a problem given the closure of all marina facilities. He changed his mind when I explained I would be returning to Barcelona that night. Having worked on boats before, I made sure that my presence was undetectable.

Work volume has remained steady. Many clients are now buying boats without seeing them first and saying, "it all rests on the survey". I explain that a condition survey looks for risks to use or value but can't replace the feelings evoked when they're on board, nor their opinion of the shade of beige used for the leather trim.

When on board, I wear a mask (required anyway in Spain), and wash my hands every hour. I maintain a 2-metre distance, explaining I follow Spanish law and UK flag recommendations. My terms and conditions already obliged clients to arrange "safe and secure" working conditions. Going forward, I see more uncertainty, and a greater desire to have a floating place of refuge. Brexit for me is possibly more of a threat to business because of the perceived cloud it places over the British flag as a viable choice for Mediterranean charter boats."

Reporting in from Antigua, **Richard Watson** said, "COVID-19 has made little difference to our lifestyle here in Antigua. We wash our hands, occasionally wear masks, have to be home before curfew and visitors are only allowed in if they have had a recent test. COVID-19 has not gained much traction in the West Indies and one of the reasons for that could well be our outdoor lifestyle, coupled with the tradewind breezes, high temperatures, humidity and UV levels.

However, due to the worldwide reaction, we were all locked down for a month and the airport was closed to passenger flights for several weeks. Since it reopened very few of the international carriers have returned and Liat, the only inter-island carrier, went into administration, so with that and



quarantine, there is now no possibility to offer services on any of the other islands.

In the second quarter of 2020, I did more C+V surveys than in previous years, mostly of US and Canadian flagged sailing yachts, whose owners chose to remain on their boats in the Caribbean this summer and needed to change insurer. However, those surveys have all been done now and as we are not sure there will be a high season this winter, belts have had to be tightened and absolutely all unavoidable expenditure has been curtailed. There were no government backed furlough schemes in the Caribbean, nor is there any social security benefit safety net. Many hotels and other businesses have closed and due to the level of unemployment the government of Antigua and Barbuda have declared a moratorium on the grant of new work permits to non-citizens, for which I should at least be grateful.

Many boat owners who flew back and hauled their boats are not going to launch them this winter as the differing quarantine requirements make it difficult to cruise between the islands. ARC is only bringing 100 boats instead of their usual 250. The Salty Dawg Rally from the US took 70 back but only 20 are returning.

The Antigua Charter Yacht Show is up in the air, it is always the first event of the season. It brings the superyachts to Antigua and if the superyachts do not come the English Harbour community will really struggle.

The RORC Caribbean 600 planned for Feb 2021 could be off too although the Caribbean Sailing Association regatta season appears to be going ahead with a full schedule.

From British Columbia, Canada, **Sarah White** writes - The reduction of flights and new airline protocols due to COVID-19 have limited travel within Canada. Some areas of the country have banned out-of-province visitors, and the US/Canada border is also closed to non-essential travel. These restrictions have affected where we conduct surveys and how we get there. If we can't reach a survey location by car within 8 hours, we have delayed or declined business. However, travel restrictions have by no means reduced workloads this year. Insurers in British Colombia have amended time frames between surveys, requiring more frequent boat inspections. Also, the travel restrictions have encouraged residents to discover their local areas. Along the beautiful coastline of BC this has led to a significant increase in boat purchases.

Before confirming surveys, we email clients asking for exclusive access to the boat. Some are willing to allow us this courtesy, and others are not. Where clients insist on being present, we impose social distancing and mask-wearing. This has received mixed responses, but so far, we have been able to carry out the surveys without issue.

In our tool kits, we carry extra masks, gloves, and hand sanitizer. Masks and sanitizers get daily use; however, the gloves do not as they interfere with the sense of touch.

Our current approach to clients and surveys will remain the norm until health authorities deem it safe to discard COVID-19 protocols. This pandemic has made us wiser and more cautious of the world around us and guarded against other potential viruses.

Based in Southern Europe, **Keith Willis** MIIMS (Dip Mar Sur), makes the following observations.

Travelling for work during this Pandemic has been challenging and I think that we are possibly in for an even more challenging period to come. Governments are trying to avoid full lockdowns by repeatedly tweaking the restrictions on movement. Full lockdown was actually easier and safer because there were so few people travelling.

My COVID-19 measures and best advice:

1. Stay informed, research where you are going and don't rely on the media. Some countries now require a negative test less than 72 hours old. I am getting tests every week in France.

2. Rules and regulations change daily, so don't take your eye off the ball. Find a reliable source of information and remember we have a big network of surveyors in the IIMS, so ask a local surveyor if you can't travel.

3. Have the right paperwork with you at all times. I have seen lots of cars turned back at borders and people refused access to flights because they don't have the right paperwork/tests.

4. Control your own situation as much as possible. I tell clients and brokers that the people attending the survey should be kept to a minimum with no non-essential people on board the vessel.

5. Don't be afraid to tell people to give you space and to put their masks on.

6. When I stay somewhere new, I have anti-bacterial wipes so that I can clean everything. Things have improved since the start of the pandemic and hotels now feel a lot safer but it's about being prepared.

7. Don't undersell your services at these times. These are risky times so make sure that the reward justifies the risk.

8. This is probably going to be around until next summer or longer, so we have to adapt to stay in business, but our safety and the safety of our families is more important.

Above all stay safe.

Impact and effect of COVID-19 in Nigeria by **M C Ogadina**, MIIMS, Regional Director Dir West Africa.

In Nigeria, the impact of the corona virus pandemic on marine surveying activities is the same as any other part of the world. The need to stay safe, obey the health regulators' guidelines, and the impact of working from home. Everyone seems to be a suspect. The government of Nigeria permitted and considered the port workers, including marine surveyors, as 'essential service' providers. Marine and port workers were allowed to move freely during the period of lock down.

The ships coming to the port were monitored by the Port Health Authorities to ensure that any vessel coming into the terminals is quarantined for a minimum of 14 days - the crew's health status verified before proceeding to load or discharge her cargo. The port workers - especially surveyors - were mandated to wear face masks and use hand sanitizers regularly for personal protection. There are no recorded infections of COVID-19 from port workers. including marine surveyors. to my knowledge.

Our experience here was a mixture of ups and down in marine surveying business. The only means of communicating with our clients is by online and sometimes that is hindered by poor internet facility in the country. New jobs and instructions for the West African ports were affected adversely due to inherent higher costs.

Prior to COVID-19, business meetings were conducted by physical contact and interactions with our clients. That has changed now. The use of online meetings and less physical contacts is the new order. We now rely on the use of our unreliable internet facility with high cost and poor connectivity.

As far as safety measures are concerned, we have adopted the use of PPE and other safety measures as demanded by the health authorities. The wearing of face masks, use of alcohol based sanitizers and social distances are compulsory in Nigeria. Everyone is trying to comply with the health regulators' guidelines, but social distancing is difficult when dealing with cargo loading and unloading from the vessel holds.

My opinion for the next 12 months will be SAFETY FIRST always for all. I recommend IIMS members to rely on other Institute members as correspondents in their locality. During this period, for example, I was able to assign two instructions to IIMS members in India, and the services were perfectly carried out by them. That to me should be the spirit of cooperation among us who are on the IIMS platform.

A touch of COVID by **Lee Warltier**, Sterling Global Marine Ltd

We are lucky with our business setup as we are divided between the yachting, cargo and commercial sectors with a young team that can adapt quickly.

March saw a sharp drop in yachting appointments specifically pre-purchase, condition surveys and compliance work. The lockdown saw the closure of most European manufacturers and our new build and pre-delivery survey work halted overnight. We furloughed everyone though reversed this decision after just one week as our other work continued and even accelerated. Anything yachty stalled though we continued to operate without a drop in pace, luckier than most!

It has been hard as we are not 'key workers' so had limited access to testing. Now our team undergo regular (private) testing at our cost. To date they've all been negative but we have contingencies in place should someone have to lock themselves away. The office has mostly been abandoned with everyone working from home and pool cars switched to company cars to prevent multiple users. We issued new risk assessments for all our work and indulged in the PPE requirements of the individual sites. It's an administration nightmare.

We've had to approach clients and commercial vessels differently; most are reluctant to allow us on board hence the testing. The superyachts have strict processes in place. Whilst the rules do not seem to be relaxing the pressure is easing as most people adapt. The next 12 months will be hard work, not so much finding the work just managing it and travelling is not as fun as it used to be!

Maurice Pickles, a UK based eCMID AVI and marine surveyor writes, "Earlier this year I wrote an article in which I shared my experience of a consultancy company wishing to engage my services as a surveyor, but who refused to support my requirements for the protection of myself and the vessel crew against the potential for COVID-19 transmission during survey. They simply removed me from the job. As a further demonstration of their ethics, when they became aware of my article, without any explanation they closed my email and dropbox accounts. I am pleased to report that for me this was a one-off isolated event and other consultancy companies I have worked for have been fully supportive and proactive to ensure the safety of surveyors. Most companies have their own COVID risk assessments and procedures that are well received by vessel operators.

On the positive side I am grateful for the support of the IIMS and MSA, the Nautical Institute and Nautilus. Each of them has published and shared details of the incident within their respective membership. The cross-industry efforts of the above and others has, in my opinion, been excellent and made a considerable contribution to the wellbeing of seafarers and surveyors/inspectors who attend vessels.

What has changed? I work primarily in the offshore oil, gas and renewables sector in The North Sea and local waters around the UK. Since the onset of the pandemic, I have conducted eCMID and OVID inspections, Marine Warranty suitability surveys, on-hire condition surveys and client specific inspections on vessels as small as a windfarm crew boat to offshore emergency response vessels and such like. Many vessel operators and oil/gas/renewable companies already have strict safety requirements and procedures. In the case of inspections, in every case a component of the inspection is now conducted remotely. Checklists have been prepared that include details of required information, depending on the requirements of the inspection format to be conducted. Previous inspection reports, ISM audits, details of statutory and trading certificates are a must, together with dates of some of the more important drills and tests. Crew competence matrices are requested with due regard to data protection. An up-to-date class status report is also extremely helpful. In the case of specialist vessels where there may be supplements appropriate to the vessels industrial mission, it is very helpful to obtain as much information as possible. Once this information is received it does provide a credible snapshot of the vessel management and compliance and can assist with planning the time spent on board.

Prior to gaining access to a vessel I have experienced a number of regimes. One client required me to self-isolate for a period of 48 hours prior to attending the vessel. This was "time on the clock" (chargeable) and required me to attend a private COVID-19 test and maintain a temperature log every 6 hours. In other cases, I have arrived at vessels and been met by a vessel superintendent and had my temperature taken. In every case I have been issued with minimum standards and expectations of the acceptable PPE required and my conduct and interaction should take place with the crew on board. The only concern I have had was when one vessel operator required an inspector to wear a facemask and a visor while on board. I raised this as a safety observation because the visor would become steamed up whilst wearing the mask, making it difficult to move around the vessel and negotiate stairways. The vessel operator was co-operative and agreed.

In the case of surveys, the approach is similar with the exception that any remote information gathering is limited. As we all know surveys are about what you see on board, so an attendance must be conducted taking the time required to obtain the required information to satisfy the client brief. I have experienced only positive interaction with vessel masters, officers and crews during inspections, including full adherence to PPE and social distancing.

20/20 - interesting as this generally implies good sight. Personally, it feels more like 20/200 vision! We were blind to the impact of COVID-19. Stay safe.

Reporting in from Australia, **Mick Dyer** says, "COVID 19 has changed the world in many ways, but I think I operate in one of the luckiest locations on the planet at the moment and feel privileged to do so. I operate from South Australia which has been very lucky to escape major infection numbers and has had lock down restrictions lifted since early August.

During heavy restriction periods, my workload decreased minimally as I was still allowed to travel to my office as well as inspect vessels in a safe manner. I conducted these inspections safely by ensuring the owner kept personal on site at time of inspection to a minimum and keeping well clear of those on site. If possible, the vessel was inspected with no one on board and I dialled up the owner or owner's rep to discuss any items requiring an explanation.

I ensured hand washing/sanitising was frequent during the inspection and wore a facemask if other persons were present.

Travelling interstate/overseas has been very restricted and I have chosen not to travel through this period and into the near future.

The next 12 months will be interesting to see if the rest of the Australian states remain with low COVID-19 numbers and border isolation decreases. I am still not travelling interstate even though some of the states have opened without isolation requirements. This will probably reduce my turnover slightly, but I feel the risk outweighs the reward and happy to stay put for now.

I hope infection numbers decrease in your part of the world soon and look forward to attending an IIMS event soon.

Singapore and the COVID-19 pandemic by **Luc Verley**...

Singapore is a relatively small state in South East Asia with a population of only 5.6 million people. It reported the first cases of COVID-19 infections in late January. The government responded with a nationwide contact-tracing program, social distancing measures and compulsory wearing of facemasks. The country went in to a lock-down from 7th of April which was extended to the 1st of June. 'Phase 1' followed - a gradual opening of businesses and from the 19th of June 'phase 2' extended up to this present day. An unexpected development in Singapore was the outbreak in the dormitories for the low wage foreign workers. Singapore houses nearly 300,000 workers for the construction, manufacturing and shipyard industries, mainly Indian and Bangladeshi nationals living in huge dormitories with up to 20 men in cramped rooms using shared bathrooms and kitchens - perfect conditions for the spread of the virus, resulting in 90% of all infections. Up to 1st of October Singapore registered totally 57,762 cases and 27 deaths.

Singapore being a maritime hub in the region plays a major role for the shipping, ship repair and offshore industry. The challenges and consequences, because of COVID-19, when working in the marine industry are significant.

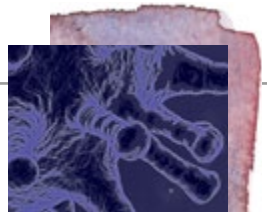
In Singapore, the recommendation of the governmental bodies is to work from home if the job function allows for it. As a result, most people are working from home, especially desk jobs. Meetings are conducted on-line using platforms such as zoom, webex, skype and teams.

Now when it comes to the non-desk part of the job it becomes much more complicated. To board a vessel in Singapore to conduct a survey, a request is to be made to the port authorities 3 days in advance. Additionally for those working in the maritime industry a scheme has been recently set-up called 'rostered routing testing', whereby it is required to go for a PCR test every 14 days.

When it comes to travel, Singapore has closed its borders and entry into Singapore for foreigners is nearly impossible. Crew changes are possible, but it is a lengthy and complicated process. Regional travel has many restrictions. The Singapore advisory is also to avoid overseas trips. If residents are returning from overseas to Singapore, a compulsory 14-day quarantine is required in a government appointed hotel facility.

My personal view is that this will continue for the biggest part of 2021 or even longer. The challenges of vaccinating the global population should not be underestimated!

Stay safe!



Here in Mallorca, **John Walker** says, "We were totally locked down for the last two weeks of March, which meant that everyone except non-essential workers were ordered to stay at home. I must admit that during this time I wondered if life would ever be the same again as there was a real nationwide sense of panic. At the beginning of April self-employed workers with permits were allowed "essential travel" on the often police road-blocked, deserted roads. Luckily, I was permitted to work and move, but it was lonely.

Mallorca being a yachting hub and with travel restrictions in place, meant potential buyers of yachts were unable to travel to view the vessels, relying on brokers' videos and/or the surveyor's explanation of condition in which to move forward. This of course placed additional responsibility and burden on the surveyor. Surveying work here has been intense, as not many other surveyors could visit - the few local surveyors were called to step in which dramatically increased workload, which is only now slowing down.

Persons in the industry have adapted, whether onboard the vessels, in the ports or shipyards to always wearing masks over nose and mouth – this is law.

The yachting season here has been strange, very few foreign owners, no bare boat charters - the residents have got their islands back! As I write this, parts of Palma are going back into partial lock-down, but most have adapted to the changes – with acceptance of the situation – of course bars/hotels and restaurants have been hit very hard. The once thronging Magaluf is now a ghost town.

Right now, as the weather is fine there are a lot of boats on the water and surprisingly (or maybe not) still a lot of accidents. BUT generally our industry is suffering as lots of people being laid off due to reduced refit work."

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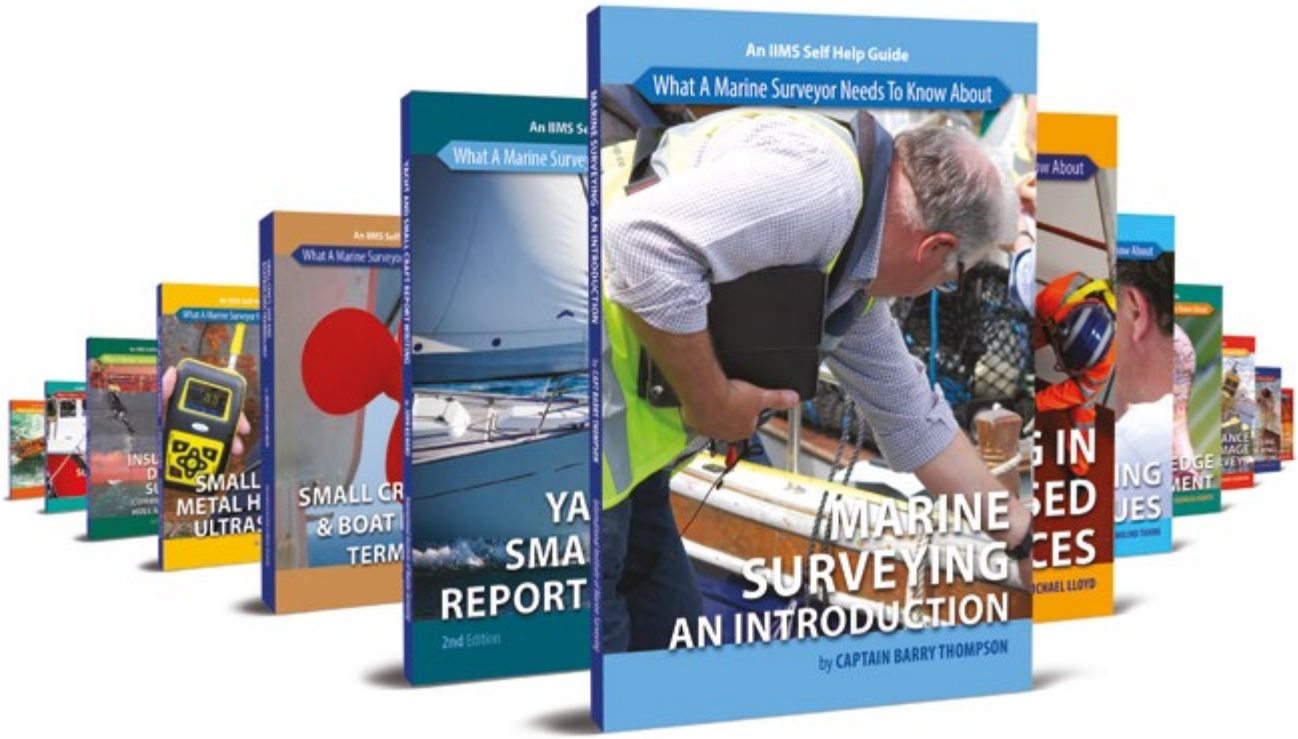

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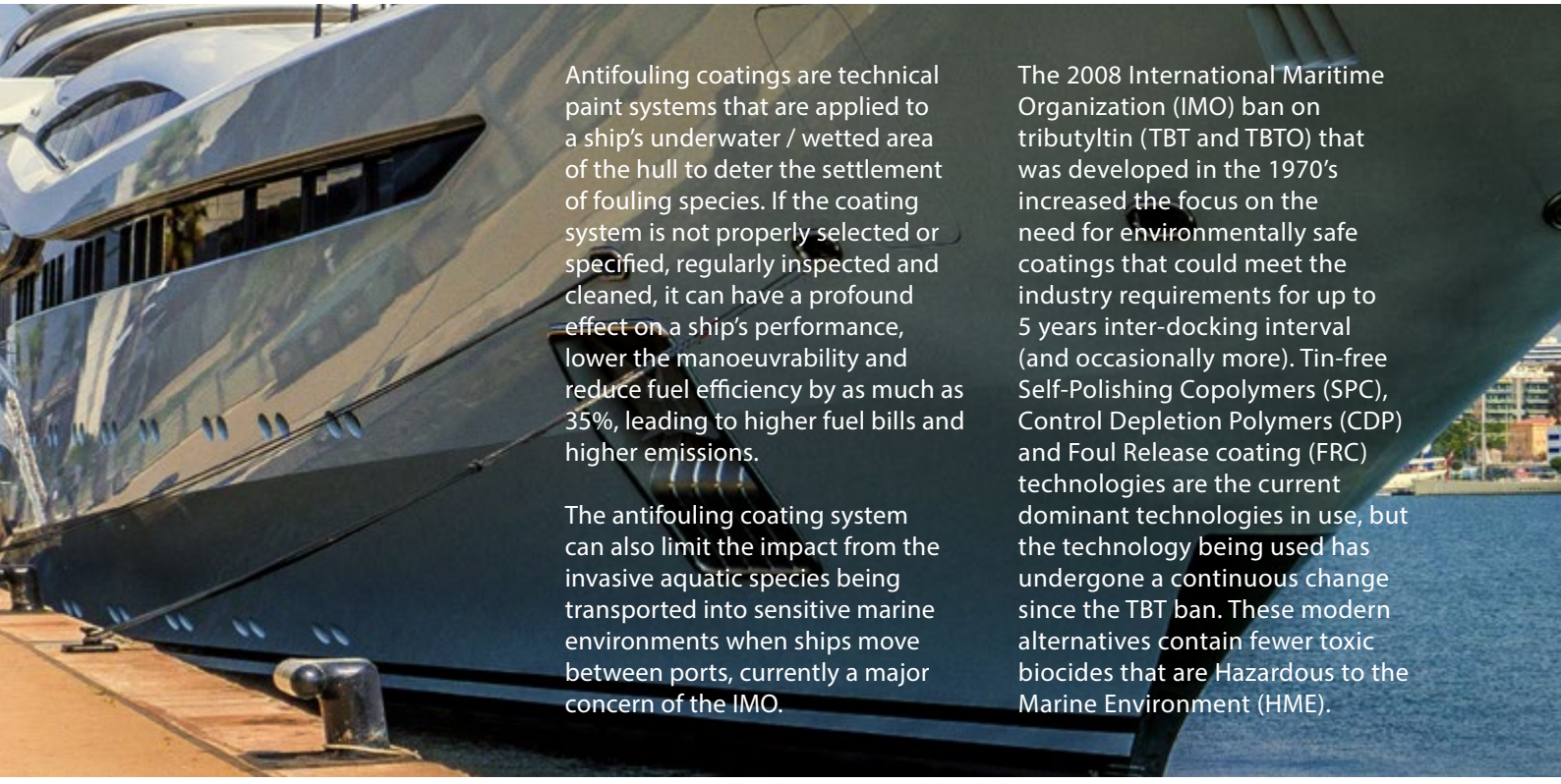
Hull Coatings:
A Slippery Subject

All manner of substances, such as bitumen, mercury and arsenic have been used as hull antifouling coatings over subsequent centuries. Today the underwater hull of a vessel is protected by coatings comprised of individual compounds to prevent corrosion and fouling integrated into a multi-coat system.



Antifouling coatings are technical paint systems that are applied to a ship's underwater / wetted area of the hull to deter the settlement of fouling species. If the coating system is not properly selected or specified, regularly inspected and cleaned, it can have a profound effect on a ship's performance, lower the manoeuvrability and reduce fuel efficiency by as much as 35%, leading to higher fuel bills and higher emissions.

The antifouling coating system can also limit the impact from the invasive aquatic species being transported into sensitive marine environments when ships move between ports, currently a major concern of the IMO.

The 2008 International Maritime Organization (IMO) ban on tributyltin (TBT and TBTO) that was developed in the 1970's increased the focus on the need for environmentally safe coatings that could meet the industry requirements for up to 5 years inter-docking interval (and occasionally more). Tin-free Self-Polishing Copolymers (SPC), Control Depletion Polymers (CDP) and Foul Release coating (FRC) technologies are the current dominant technologies in use, but the technology being used has undergone a continuous change since the TBT ban. These modern alternatives contain fewer toxic biocides that are Hazardous to the Marine Environment (HME).

However, as a result of the presence of less effective biocides (or in a number of cases, none) in the coating system chemistry, the rate of fouling on ships' hulls is in general higher than with the later generations of their TBT predecessors.

The European Union (EU) currently has the most stringent requirements when it comes to the application of biocidal coatings via the EU Biocidal Products Regulation (BPR). Signatories to the International Convention on the Control of Harmful Anti-fouling Systems in Ships (AFS) Convention have also recently agreed to banning the use of the biocide cybutryne (Irgarol) from 2021.

This has led industry to develop new innovative solutions to prevent invasive species from adhering to ships' hulls, some of which are as follows:

- Hydrophobic foul-release coatings: these low energy coatings enable an easy release of marine organisms.
- Alternative biocides and biocide free: these systems include a self-polishing biocide-free product and alternative new biocides that can be used to replace copper, such as Medetomidine (Selektope) and Tralopyril (Econea).
- Nano antifouling: these coatings create a surface so slippery that no organism can stick. Studies have indicated that it can work, but only on boats with speeds of 10 knots and higher.
- Hard scrubbable coatings: these do not offer any fouling prevention technology but are designed to withstand the harsh abrasive nature of underwater hull cleaning and rely on regular cleaning to ensure a foul free hull.

NEW PRODUCT DEVELOPMENT

New antifouling product development is by its nature an ongoing process using experimental design to minimise the number of experiments carried out, in combination with an extensive field and vessel trials programme. Timescales will inevitably be long, possibly up to 5-10 years.

Carl Barnes from Safinah Group says "to convince shipowners and operators, new antifouling coatings must be proven in a range different environmental conditions over a significant period of time (typically more than 3 years) on multiple test patches and full vessel applications. The cost of an antifouling failure to a ship owner is significant and they are very reluctant to use unproven technology".

Barnes continues: "Shipowners and operators will however continue to be under ever increasing pressure to control costs and to comply with emissions to air and sea. To meet these targets, they must rely on antifouling coatings that are compliant with national and international regulations. Therefore, collaboration between shipowners / operators, regulators, coating suppliers and other industry bodies will be critical in helping bring new antifouling products to the market in a timely and efficient manner".

WHAT IS BIOFOULING?

Marine fouling is the accumulation of micro- and macro-organisms on immersed surfaces which lead to economic, environmental or safety-related negative effects. Marine fouling generates surface roughness which increases the drag resistance of a ship moving through water and consequently increases fuel consumption and emission of greenhouse gases. Heavy calcareous fouling may results in powering penalties of more than 85%. Moreover even slime films can lead to significant increases in resistance and powering (approximately 20%).

However successful an antifouling coating might be, with the current levels of activity there will always be an accumulation of marine growth on a ship's hull when in service. Biofouling or biological fouling (micro or macro) is the accumulation of microorganisms, plants, algae, or small animals on the wetted surfaces of a ship's hull. There are over 5000 marine species that have been identified as biofouling organisms, all of which are of a sessile form (i.e. an organism such as a barnacle) that are fixed in one place and immobile.

Maintaining a clean hull during a ship's service cuts out the need for costly cleaning operations and/or premature drydocking.

The IMO's Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (Biofouling Guidelines) (resolution MEPC.207(62)) are intended to provide a globally consistent approach to the management of biofouling, which is the accumulation of various aquatic organisms on ships' hulls. There are systems being developed (www.portshield.co.uk) that set out to assist ship owners to comply with these emerging requirements with particular emphasis on hull-borne invasive aquatic species.

WHAT ELSE CAN BE DONE?

BIMCO in partnership with several shipping organisations and specialist hull cleaning companies, has moved a step closer to finalising a global set of guidelines needed to protect the marine environment from invasive species and reduce CO2 emissions.

There is currently no common global standard for cleaning ships' hulls to avoid transferring invasive aquatic species from port to port or for the potentially damaging debris washed off in the ships' hulls during the cleaning process.

The standard would ensure that the result of the cleaning complies with a set of specifications, controls

the environmental impact of the process and coating damage as well as promoting a safe and effective cleaning processes.

Aron Sørensen, BIMCO's Head of Marine Environment says: "The new in-water cleaning standard puts great emphasis on capturing what is removed from the ship, thereby ensuring that the marine environment is not negatively affected. We believe that a global standard will create much needed transparency along with economic and environmental benefits for shipowners, ports, port authorities and in-water cleaning companies,"

There are additional benefits to a global standard:

- Collecting materials removed from the ship and thus reduce the pollution from heavy metals and paint flakes released into the ocean during underwater cleaning.
- Reducing the risk to divers cleaning the hulls.
- Maintaining the performance of the anti-fouling systems (i.e. hull paint).

The standard is currently being trialled by a number of specialist hull cleaning companies to confirm the practicalities of global implementation. However, the approval standard is still under development and ultimately, BIMCO would need to ask the IMO for its adoption, which might take two to three years.

An approval standard will also address minimum requirements on approving and certifying in-water cleaners based on testing verified by accredited laboratories and certificates issued by internationally recognized classification societies. A certificate based on an approval standard will show that the equipment and the procedures used by in-water cleaning companies meets the highest industry standards.

ARE THERE ANY RESTRICTED AREAS?

Anti-fouling and in-water cleaning in the territorial waters of Australia and New Zealand is not permitted whilst in port. However, both administrations have issued detailed guidelines to assist ship owners and operations.

The guidelines provide best practice approaches to applying, maintaining, removing, and disposing of anti-fouling coatings and managing biofouling and invasive aquatic species on vessels and movable structures.

Additionally, one of the following measures must be applied before arriving in the territorial waters of New Zealand:

- Cleaning before visit to New Zealand or immediately upon arrival in a facility or by a system approved by the Ministry for Primary Industries (MPI).
- Biofouling must be removed from all parts of the hull and niche areas through cleaning that is carried out less than 30 days before arrival to New Zealand or within 24 hrs after arrival.
- Continual maintenance using best practices such as those within the IMO biofouling guidelines, including the application of appropriate coatings; operation of marine growth prevention systems on sea-chests; and in-water inspections with biofouling removal as required.

MPI requires information from vessels to be sent 48 hours before entry to New Zealand and the following information must be held on the vessel:

- Intended length of stay and intended places to be visited.
- Whether the vessel has spent any extended periods of a stationary nature in a single location.
- Age of the antifouling coating, including when it was applied and when it expires.
- If the vessel is coming to undergo biofouling cleaning on arrival, any formal arrangement for cleaning or treatment that they have undertaken.
- Measures that have been or will be used to meet the requirements of the standard.
- Whether the operator or person in charge has developed an MPI-approved Craft Risk Management Plan to comply with the required Standard.

New Zealand has also announced introduction of a new biofouling survey that will involve compulsory hull checks. The aim is to build a profile of vessels that are most likely to be contaminated with foreign marine species.

According to Biosecurity New Zealand, part of the country's Ministry for Primary Industries, the ships randomly selected to take part in the survey will have to undergo a dive inspection and answer questions about biofouling. Beginning in August 2020, the project is to take up to two years and involve up to 40 vessels.

BIMCO RESEARCH, OTHER FACTS AND FIGURES

- There are more than 80,000 large merchant ships in the world.
- A country like Australia, has around 30,000 commercial port calls every year.
- A ship needs a hull cleaning around every two years – depending on where in the world it trades.
- The standard addresses cleaning of the hull as well as niche areas, such as bow thrusters and propeller shafts.
- Commercial diving is comparatively dangerous. In the UK, the fatality rate for commercial divers, according to figures published in 2010 by the Health and Safety Executive (HSE), ranges from 20 to 40 per 100,000. This risk factor is 12.3 to 24.7 times higher than that of the construction sector.

Carl Barnes and Alan Guy of Tyneside-based independent marine coating consultants, Safinah Group recently published a paper in the Royal Institute of Naval Architects publication. In the paper they discuss the development of copper-free antifouling coatings and the challenges faced in bringing new products to the market.

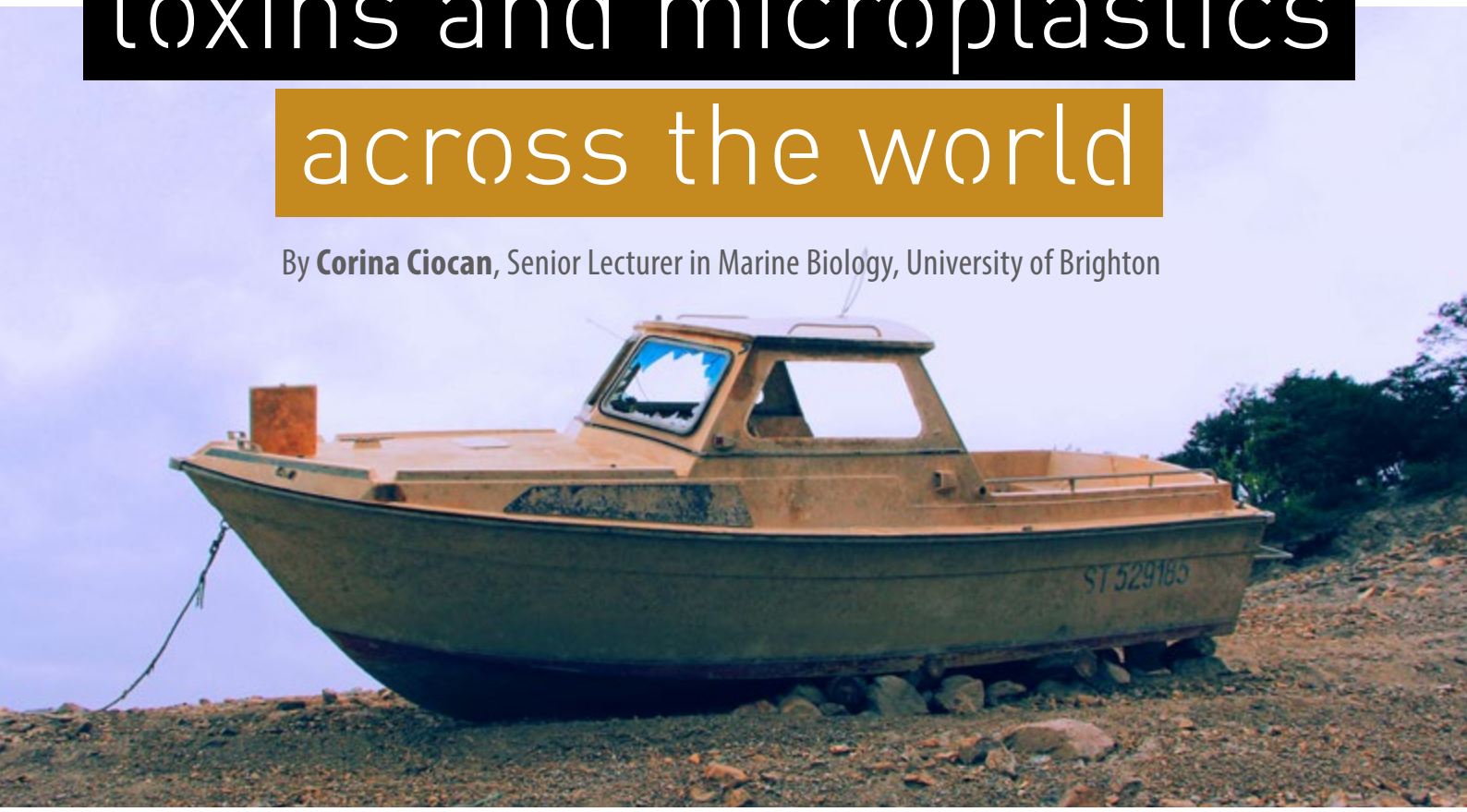
Safinah Group also have analysed underwater hull fouling condition on a sample of 249 ships which drydocked over a four-year period between 2015-2019. The sample included all major ship types covering a range of trading activity.

It was found that nearly every vessel surveyed had some degree of underwater hull hard fouling. On 44% of vessels surveyed, over 10% of the underwater hull surface was covered with hard fouling. Anything more than 10% coverage is deemed to cause an 'unacceptable' impact on vessel performance by experts.

On many of the vessels surveyed, fouling levels were even worse; approximately 15% of vessels had between 10-20% of hard fouling coverage on the hull, 10% of vessels had 20-30% of hard fouling coverage and the remaining 10% of vessels had between 40-80% of hard fouling coverage.

Abandoned fibreglass boats are releasing toxins and microplastics across the world

By **Corina Ciocan**, Senior Lecturer in Marine Biology, University of Brighton



Corina has spent more than 15 years working as a researcher in various Aquatic Ecotoxicology groups around the world and then accepted a Lecturer position at the University of Brighton. Her research interests focus on the biological effects of various classes of aquatic environmental stressors, contaminants in particular, at cellular and molecular level - functional ecotoxicology. The key challenge is to understand and define the mechanisms of action of newly emerged contaminants that can negatively impact the health and physiology of marine organisms.

This is not the first time that IIMS has looked at this vexing subject in The Report Magazine and it is clearly a mounting issue for the worldwide marine industry to get its collective mind around and an acceptable solution needs to be found, or the consequences appear grim and of concern to us all.

Where do old boats go to die? The cynical answer is they are put on eBay for a few pennies in the hope they become some other ignorant dreamer's problem.

As a marine biologist, I am increasingly aware that the casual disposal of boats made out of fibreglass is harming our coastal marine life. The problem of end-of-life boat management and disposal has gone global, and some island nations are even worried about their already overstretched landfill.

The strength and durability of fibreglass transformed the boating industry and made it possible to mass produce small leisure craft (larger vessels like cruise ships or fishing trawlers need a more solid material like aluminium or steel). However, boats that were built in the fibreglass boom of the 1960s and 1970s are now dying and have reached the end of their lives.

A 1968 magazine advert for Chrysler boats. Fibreglass helped bring boats to the mass market. ***Credit SenseiAlan/flickr/ Chrysler, CC BY-SA***

We need a drain hole for old boats. We can sink them, bury them, cut them to pieces, grind them or even fill them with compost and make a great welcoming sign, right in the middle of roundabouts in seaside towns to welcome tourists.

But there are too many of them and we are running out of space. To add to the problem, the hurricane season wreaks havoc through the marinas in some parts of the world, with 63,000 boats damaged or destroyed after Irma and Harvey in the Caribbean in 2017 alone.

Most boats currently head to landfill. However, many are also disposed of at sea, usually by simply drilling a hole in the hull and leaving it to sink someplace offshore.

Some say that dumped fibreglass boats will make suitable artificial reefs. However, very little research has been done on at-sea disposal and the worry is that eventually these boats will degrade and move with the currents and harm the coral reefs, ultimately breaking up into microplastics. Recently, scientists have investigated the damage to mangrove, seagrass and coral habitats and although the effects have only been recorded on a relatively localised basis for now, the cumulative effect of abandoned boats may increase exponentially in the coming years.

To take one example, researchers from Plymouth University found high concentrations of copper, zinc and lead in sediment samples and inside the guts of ragworms in two estuaries in eastern England (Orwell and Blackwater). These contaminants greatly exceeded the environmental quality guidelines and came from peeling paints from boats abandoned nearby.

Old fibreglass boats are often dumped once the cost of disposal exceeds the resale value, becoming the liability of the unlucky landowner. Human health hazards arise from chemicals or materials used in the boat: rubber, plastic, wood, metal, textiles and of course oil. Moreover, asbestos was employed extensively as an insulator on exhausts and leaded paints were commonly used as a corrosion inhibitor, alongside mercury-based compounds and tributyltin (TBT) as antifouling agents. Although we lack evidence on the human impact of TBT, lead and mercury are recognised as neurotoxins.

And then there are the repairs – grinding away at fibreglass boats, often in the open, creating clouds of airborne dust. Workers have not always worn masks and some succumbed to asbestosis-like diseases. Inevitably, some of the dust would find its way back into the water.

The fibreglass is filtered by marine shellfish (in my own research I found up to 7,000 small shards in oysters in Chichester Harbour in southern England) or cling on the shells of tiny water fleas and sink them to the seafloor. The particulate material accumulated in the stomach of shellfish can block their intestinal tracts and eventually lead to death through malnutrition and starvation.

The microparticles stuck on water fleas may have repercussions for swimming and locomotion in general, therefore limiting the ability of the organisms to detect prey, feed, reproduce, and evade predators. There is huge potential for these tiny specks of old boats to accumulate in bigger animals as they are transferred up the food chain.

Those microparticles are the resins holding the fibreglass together and contain phthalates, a massive group of chemicals associated with severe human health impacts from ADHD to breast cancer, obesity and male fertility issues.

Abandoned boats are now a common sight on many estuaries and beaches, leaking heavy metals, microglass and phthalates. It is time to really must start paying attention to the hazard they pose to human health and the threats to local ecology.

This article is published courtesy of The Conversation where it was first published and may be viewed at **https://bit.ly/2XKLKjo**.

End of use boats... things are happening

By Peter Franklin

Millions of boats that were built in the 70's and 80's from virtually indestructible GRP (fibreglass) are now referred to as 'end-of-use' boats. Committing redundant GRP hulls to landfill is not an environmentally acceptable option, as they will still be there in hundreds of years' time.

The challenge for our industry now, is to create a new sub-sector which can responsibly dispose of them. In this blog we look at how France, USA and Norway are working on a solution by disposing boats the same way as the automotive industry have done for end-of-life cars.

AMBITIOUS PLANS FOR BOAT DISPOSAL IN FRANCE

APER, a non-profit organisation established in 2009 by the French Nautical Industries Federation, has established the first boat dismantling network in Europe. However, only 1 in 10 quotes were being accepted as owners were understandably reluctant to pay for something they would no longer enjoy.

That's why as of this year, the APER network will become an industry funded 'Eco-Organisation', giving boat owners the chance to have their vessel disposed of for free, providing they can get it to one of the dedicated centres at their own cost.

Project manager Ivana Lazarevic told us that they expect to responsibly dispose of 1800 boats this year, with an overall target of 20,000 to 25,000 boats handled in the coming five years via a network of 20 to 30 approved centres.

Regarding the challenges of GRP recycling, Ivana admits that there is work to do, but points out that around 200,000 tons of fibreglass are used for construction purposes every year in France of which only around 5% is used in boats. She therefore believes that working with other industries who have the same end-of-life considerations will provide the solutions.

POSITIVE PROGRESS IN USA

Evan Ridley, from Rhode Island Marine Trades Association, is managing the company's Fibreglass Vessel Recycling Pilot Project. With operational donations from major players in the leisure marine market such as 11th Hour Racing, BoatUS and Brunswick Manufacturing, they are now in the process of collecting 20 tons of fibreglass material from end-of-use boats. This will be used in an extended 'cement kiln trial' carried out in conjunction with the industrial waste specialists Geocycle, and the cement manufacturer LafargeHolcim.

Geocycle applies the proven technology of 'co-processing' by utilising existing facilities in the cement manufacturing industry to resolve waste challenges in a sustainable way. Through high temperatures, oxygen excess and long residence time in the process, the cement kiln completely destroys composite waste materials. As a result, it leaves no residue that needs to be landfilled, as the ash reacts with other components to form the manufactured final product.

Evan and his team expect to be able to start sharing the outcomes of their trial by mid-year, including financial and best practice management data. They are hopeful that other States in the US will be able to replicate their model, and begin the volume processing of waste GRP composites from end-of-use boats via the cement industry route.

GRP RECYCLING, A REALITY IN NORWAY

Pål Hernes, a business consultant working with the environment agency in Norway, sees a positive progress in Scandinavia on end-of-use boats.

With backing from the Norwegian government, a company called Ecofiber Recycling found ways to break down the redundant GRP composite and turn it into new reusable materials.

Their GRP conversion process produces a number of quality graded, reconstituted granules or individual fibres, these have all been independently tested and certified for their suitability to be used in new production processes.

For instance, one of the substances is being used in the production of a 14 ft (4.2 metre) dinghy, where the inner floor is recycled material, together with most of the stern, seats, and gunwale, basically most of the upper part. This has been found to add stiffness to the hull, and to provide an ideal substrate for mounting equipment with screws, all at a competitive material cost.

Another important development in Norway, has been the decision by the Environment Agency to provide a payment of 1000 Norwegian Kroner (about 100 euros) to the person who delivers the end-of-use boat to the disposal centre. This 'grant' is also available for smaller boats up to 5 metres, which can be delivered to a domestic waste disposal site, where normal household waste is usually taken.

THERE IS A COMMON THEME IN THESE SUCCESS STORIES

In every case there is funding provided, and the cost to the last owner of the boat is removed from the equation. Combined with even more technical innovation and strategic thinking, this is surely the way forward for a long-standing problem that our industry really has to get to grips with!

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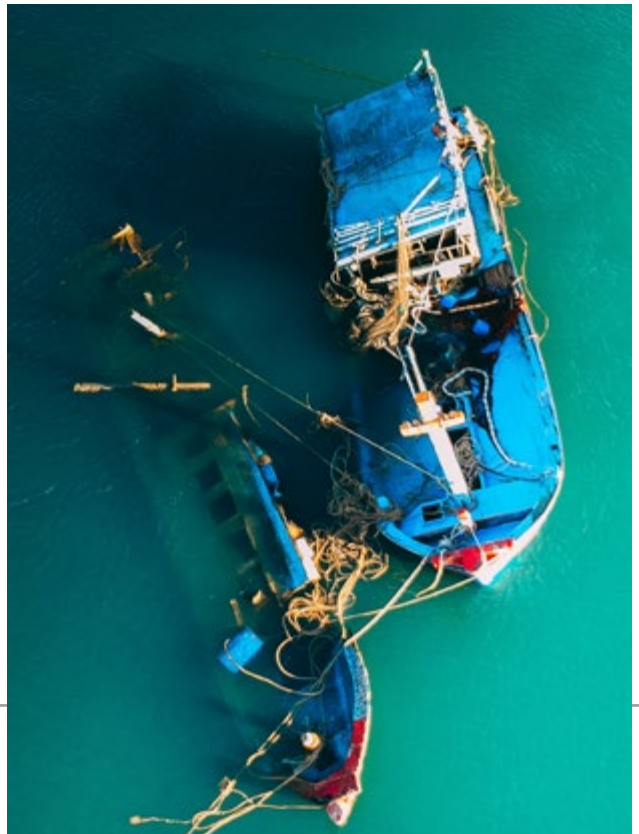

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Alternatives to at sea disposal for end-of-life reinforced plastic vessels - IMO's position -

IMO has been studying this major problem facing the worldwide boating industry in recent years and last year produced a detailed report entitled 'End of life management of fibre reinforced plastic vessels: Alternatives to at sea disposal'.

The background to their report and its Executive Summary are reproduced here with their kind permission and the full 48-page report can be accessed in pdf format at **https://bit.ly/35mkL26**.

Background to the report and how it came about

In 2016, the London Convention and London Protocol (LC/LP) governing bodies, having reviewed the LC/LP Scientific Groups' discussion on the widespread nature of the problem of disposing of fibreglass vessels, particularly those that had been abandoned, instructed the Groups to propose recommendations regarding whether to develop advice on the disposal of fibreglass vessels.

In 2017, the governing bodies, noted the Scientific Groups' discussion on the disposal of fibreglass vessels, and that the issue seemed to be of direct relevance and concern not only to Small Island Developing States (SIDS), but also in other countries with large numbers of recreational craft. They subsequently instructed the LC/LP Secretariat to engage a consultant to collate information on the scale of the problem and to identify key knowledge gaps relating to impacts of fibre-reinforced plastic vessels dumped or placed in the marine environment.

IMO is one of the partners in the UN Environment-led Global Partnership for Marine Litter (GPML), and within the framework of this partnership, the LC/LP Secretariat was able to allocate GPML funding to commission a study on the end of life management of fibre-reinforced plastic (e.g. fibreglass) vessels, and on alternatives to disposal at sea. In January 2018, a consultant was contracted to carry out this study.

A draft report prepared by the consultant was reviewed by the Scientific Groups in May 2018. The main objective of the review was to provide an overview of the current state of knowledge regarding the end-of-life management of fibre-reinforced plastic (e.g. fibreglass) vessels, and on alternatives to disposal at sea and therefore provide the LC/LP governing bodies with a better understanding of the scale of the issue, the options for disposal and recycling, and the potential impacts of fibreglass in the marine environment enabling them to determine if any further guidance needed to be developed.

It should be noted that the purpose of the report is to inform discussions on the end of life management of fibre-reinforced plastic (e.g. fibreglass) vessels within the LC/LP. It does not claim to be a complete review of all aspects related to this issue, but will hopefully raise awareness and stimulate further discussions on this issue, both in relation to the LC/LP and within the wider global community.

Acknowledgements

This study was made possible through the funding from the GPML, administered by UN Environment. The Office of the London Convention/Protocol and Ocean Affairs would like to thank the consultant, Dr. Simon Bray (AQASS Ltd) for his work in compiling this report. Thanks are also due to the delegations from LC/LP Contracting Parties and observers that contributed information to the study and provided a review of the draft report

The report's Executive Summary reads as follows:

Fibre reinforced plastic (FRP) was created in the 1930s and generally commercially available for boat production from the 1950s. FRP vessels were given a life expectancy of 30-50 years, whilst in practice many older boats are still in service. This has resulted in a growing number of end-of-life vessels which, whilst no longer financially viable, have substantially intact hulls with limited options for their disposal bar landfill. It is evident that the difficulty of FRP boat disposal has been considered since the 1980s. Attention from industry, research and policy has increased with interest in potentially making boat owners and/or manufacturers financially responsible for end-of-life management of FRP boats.

The issue of end-of-life management of FRP vessels was raised by parties to the London Convention and London Protocol, specifically small island developing states (SIDS). This resulted in the International Maritime Organization (IMO) commissioning this study to review and summarise currently recognised options for the disposal and recycling of end-of-life FRP boats and to identify where guidance and further work may be required. Whilst the situation of disposal of end-of-life FRP boats was considered in general terms, this study was particularly focused on the practice of at sea disposal and the magnitude of the situation as affecting management in SIDS.

Review of available literature shows that numerous bodies (user groups, Government, industry) have undertaken studies to consider disposal options, with the impetus of finding a sustainable solution for FRP hull disposal. However, most reports and papers conclude that there is not

currently a fully viable financial market for the material as the price for recycled fibreglass is too low to promote the industry.

The major current options are landfill, though some nations are now restricting the disposal of FRP materials in landfill space. Whilst financially viable options are currently limited, the market is being developed with crushed FRP material being used in, amongst others, concrete, tarmac and also as filler for other FRP items. The market is well intentioned, though as a cost model appears to have limited application, and importantly is more marginal in SIDS due to a lack of infrastructure to recycle. If this model is used on SIDS it will likely incur significant off-island transport costs for FRP material.

"The main aim is to achieve end-of-life management leading to either reuse (re-purposing) or recycling."

Research and trials are considering options that include pyrolysis where material is burned at temperatures to recover fibres for re-use (though resins are lost in combustion) and solvolysis where chemical replacement releases the resins and fibres for re-use; though these processes are expensive and not fully commercially viable at present, researcher and commercial groups are working towards financial feasibility. With regard to achieving financial sustainability to make end-of-life FRP boat disposal viable, instruments such as a levy on manufactures have been suggested and the option of charging users for end-of-life FRP disposal is potentially being trialled in France.

The environmental effects of current disposal options are discussed. Burning, previously practised on some SIDS, is known to release highly toxic compounds with a range of possible effects on biological organisms. Landfill options are largely related to the amount of space taken up, which in SIDS is a significant issue. FRP chemical breakdown and risk in landfill has been considered, though degradation is viewed as unlikely with FRP material, showing little change over time. At sea disposal is less well understood and whilst deliberate scuttling has been used as an option, FRP boats are often just left to decay on abandoned moorings.

MARPOL makes it illegal to discharge plastic at sea, but FRP hulls are not covered as MARPOL is pertinent to shipborne garbage and the London Convention and London Protocol do not explicitly address FRP vessels.

There is limited research on at sea disposal though it is evident that dumped FRP vessels do not make suitable artificial reefs as they are likely to break up, and may be moved by currents and wave action potentially harming sensitive features (e.g. reefs, seagrass) and communities. In addition, FRP material will ultimately break up to potentially become microplastics with, as yet, poorly understood ecological pathways and direct biological effects, though its known plastics sorb organic and heavy metal pollutants potentially making them more bioavailable to organisms which may ingest plastics.

The problem of end-of-life FRP boat disposal and management has taken global proportions with an increasing number of vessels needing management. This is particularly pertinent to SIDS with space being a significant issue and disposal at sea having wider implications for the marine community on which people may be dependent and possible pathways to humans for plastics and associated pollutants. Some island nations are actively seeking options including pyrolysis and have halted at sea disposal with ongoing plans for FRP wreck management under the Nairobi International Convention on the Removal of Wrecks 2007 but as outlined, other legal instruments have poor applicability and the Nairobi Convention on wreck removal is targeted at vessels greater than 300 tonnes and to date has only been ratified by 41 states.

Research areas relating to management and disposal of end-of-life FRP hulls are numerous. Though current progress may be limited, further research into sustainable options is being addressed due to increasing interest and financial / policy drivers. The main aim is to achieve end-of-life management leading to either reuse (re-purposing) or recycling. With particular emphasis upon islands, these goals require appropriately targeted attention to avoid growing conflict with natural resources and unregulated disposal of FRP waste with potential environmental consequences.

Materials, what's new?
basalt fibre composites

By **Simonetta Pegorari**

Globally, carbon fibre composite materials (CFRP) are enjoying great demand thanks to their use in important sectors such as aerospace, automotive and of course nautical and naval. They represent the most valuable market, together with glass fibre composites (GFRP). At the same time, the search to find new alternative materials, more performing or cheaper, but above all eco-sustainable, continues fast.

Simonetta Pegorari is an architect, who graduated from the Politecnico di Milano and studied at Southampton University in the UK. She is an expert in composite materials and was one of the founders of Assocompositi, the Italian association of composite materials. For 20 years Simonetta has been active in the publishing industry and technical disclosure with the industry. She is organiser of technical conferences and promoter of the international competition "Carbon Fiber Design Contest", which aims to raise awareness of young creatives, designers and architects about the use innovative of carbon fibre combined with modern technology of additive manufacturing.

Simonetta is currently a columnist for Jec Magazine, Il Progettista Industriale, Macplas, MetsTrade BLOG and Nautech. He business, Studio Pegorari, provides technical marketing, communications and PR support to the composites materials industry.

THE POTENTIAL OF BASALT FIBRE COMPOSITES

An extremely interesting sector is represented by basalt fibres.

Basalt is a rock of volcanic origin. Basalt fibres have been known for many years in the world of composites, especially in non-EC countries, such as the former USSR countries and China. The rock is produced by the rapid cooling of lava rich in magnesium and iron and the fibre produced exhibits excellent thermal insulation and fire resistance properties, as well as very high service temperatures. These key properties have made basalt fibre a standard material for insulation products in high temperature applications, such as industrial furnace linings and flame-retardant wire rope.

BASALT

For many years there has been talk of the use of basalt for reinforced polymer composite materials, although in reality the market still seems reluctant to take off. It must be said that basalt fibre producers are making progress on technical and market barriers with large-scale applications.

The field of application is wide from the construction, aeronautical and nautical sectors. In addition to its thermal properties, the combination of strength, impact and chemical inertness also made basalt attractive for applications in the composite industry. Therefore, it is not clear why glass fibre reinforced basal composites (BFRPs) have not yet managed to enter the market significantly, although recently it seems that the situation is changing.

The first patent for the production of basalt fibre dates back to 1923 and military applications were studied in the 1950s and 1960s (especially in the former Soviet Union).

A few years ago, a report claimed that the global basalt fibre market in 2020 would reach $200 million US dollars. One of the reasons that may have led to this trend growth is the increasing use of basalt fibre in hybrid composites, the demand from the automotive sector and the attractiveness of basalt's recyclability coupled with its strength (which is said to be greater than that of glass E). The thermal properties of basalt fibre also affect applications for insulation.

New opportunities are opening up for BFRP applications that require high and/or wide-ranging service temperatures. Impact resistance significantly differentiates basalt fibre from glass and carbon. A study by the Institut für Textiltechnik der RWTH (Aachen, Germany), demonstrated a 35% higher specific energy absorption capacity of a basalt hybrid fabric (HYWF) with polyamide resin compared to HYWF/ polyamide glass and 17% higher than HYWF carbon/polyamide.

Basalt fibres offer better **corrosion and fire resistance** than that provided by glass. A recent study confirmed higher tensile modulus, tensile strength and interlaminar shear strength, 40% higher specific strength and 20% higher specific stiffness for Basalt Fibre/Epoxy Test Panels than Glass Panels E/epoxies made with the same resin and manufacturing process.

Basalt fibre has **low water absorption**, a very important feature in nautical construction. It is also electrically non-conductive and, being a natural material, it is also intrinsically more recyclable than other reinforcing fibres, a factor that is of considerable importance for the nautical industry today. A switch from carbon fibre to basalt appears to be easier to make than switching from E-glass to basalt, but both are doable. As far as carbon fibre is concerned, cost savings are typically the primary justification for moving to BFRP; applications for which carbon fibre exceeds the performance requirements can be met at the cost-performance point offered by basalt. Equally important in some applications are the different ways of damaging carbon and basalt. While carbon fibre tends to "shatter" catastrophically and sometimes in multiple places, basalt fibre exhibits a softer mode of failure. The relative cost of the fibre of basalt has decreased as production methods have become more efficient, but it is still more expensive than E-glass.

Although a substantial breakthrough in the BFRP has not yet materialized, progress appears to be taking place on all necessary fronts: efficiency and production capacity, global presence, product design and development and regulatory activity.

BASALT RODS

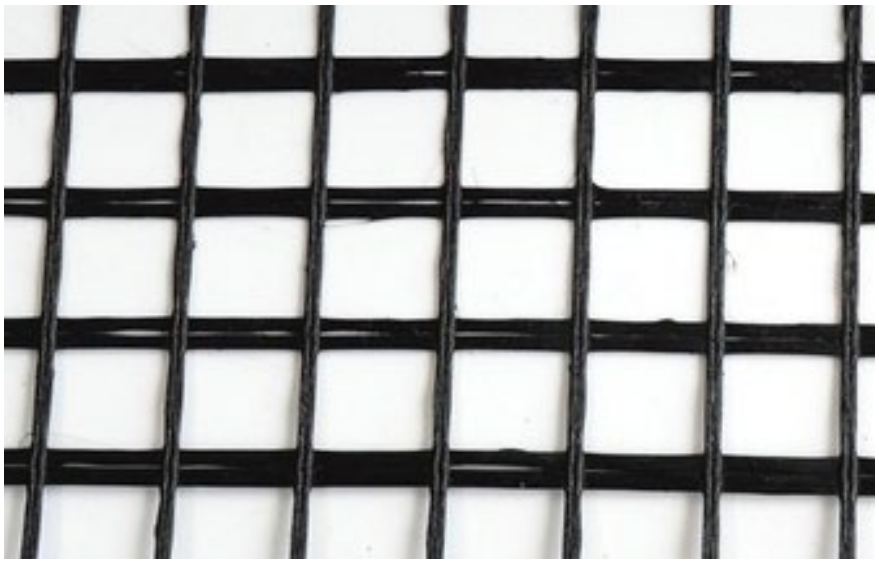
Going back to the yacht industry, since 2010, the 'Go Sailing, for a Change' is an Italian startup whose aim is to promote and disseminate sustainable solutions. The team has been scouting environmentally friendly technologies that could be successfully transferred to the sail-racing industry. In 2013 they patented a process to make out of autoclave panels and curved surfaces in **basalt fibre**, greatly reducing manufacturing costs hence widening the range of applications that could benefit from this technological concept.

Over the past few years Cristiana Talon and Enrico Benco, the two founding partners, have been developing innovative concepts aimed to recyclable composites materials. GS4C embarked in the manufacturing of a 100% recyclable sail-racing boat. The boat is a Mini650, designed to race single handed across the Atlantic in the Minitransat. The plan was to be the first boat entirely made in sustainable fibre and recyclable epoxy resin. This groundbreaking achievement is both a showcase of environmentally friendly composite manufacturing and the demonstration that this can be obtained with no compromises on performance. The technology will eventually find its way into other industries sharing similar requirements of lightness and high-end mechanical characteristics, setting a new standard for sustainable composite manufacturing.

The research carried out in the field of sustainability and recycling for the sailing industry has already raised a certain level of interest among the industry operators. In November 2015 the project was presented for the first time in Amsterdam at "The Future of Yacht Recycling" conference during the METS show.

THE PROJECT

The Mini650 are 6.5m long monohulls designed for shorthanded sailing. Several technological innovations have been introduced in the mini class before being accepted on bigger boats, like Open 60s, Volvo 70s (now 65s), and production cruising boats. An innovative and disruptive project as a composite sail-racing boat made entirely from basalt fibre and a bio-based epoxy that is 100% sustainable and recyclable, was a chance to prove that innovation and sustainability do not necessarily compromise performance and safety, to promote the message and the vision for a low environmental impact manufacturing process.



BASALT FIBRE MESH

BASALT UD

A sailing boat operates in one of the most difficult environment for composite materials (with exposure to UV and salty water), adding to that the requirements of lightness and the mechanical solicitation the structure has to withstand. The project will be a very reliable test and promotion for the technology.

A first phase of scouting for sustainable technologies was followed by weaving tests and composite panel lab testing. Suppliers were selected among the ones sharing the vision for sustainable development. The recycling process was verified in the lab at LinseT in Italy. The recovered fibre was sent to the fibre manufacturer to verify that it could eventually be re-entered into the production cycle.

The fibre is Filava™ from the Belgian Company Isomatex S.A. The production of Filava™ is unique thanks to a genuine and innovative treatment of the raw material, basalt, which is enriched with various mineral additives to increase and guarantee its original mechanical and chemical properties.

The components used and the fabrication process are Isomatex's specific and exclusive expertise. Isomatex controls every step of the production process with cutting-edge equipment. These have been carefully selected for their proven performance and reliability in

BASALT IS THE MATERIAL TO PRODUCE THE FILAVIA SUSTAINABLE FIBRE

many industrial environments. The production is fully automated, which guarantees total quality control and full traceability.

Isomatex is a green company, using every possible technology to minimize the impact of its production on the environment which complies with all IPPC regulations (Integrated Pollution Prevention & Control) and with the European rules on the environment. Filava™ itself is a stable mineral product, completely neutral for the environment and fully recyclable making it completely green from production to products.

The resin is Super Sap from Entropy Resins. Recyclability and End of Life is Entropy's next step to complement the CO2 Reduction and Biobased systems that Entropy Resins has been offering to the industry. The Entropy ReRez system allows for full cradle-to-cradle solution, where reinforcements can be reclaimed in a near-virgin like state and epoxy matrix is converted into commercially valuable thermoplastic. The recycling process is a low energy, solution-based process. The same applies to waste or by product from manufacturing process, true to the zero landfill manufacturing claim. For the project, the team will use the new vacuum infusion epoxy system. Lamination techniques are equal to the ones used with traditional materials.

This project could be a breakthrough in composite manufacturing and a first move towards circular economy, as advocated by many leading economists and environmentalists. Given the short life of sail-racing boats, where rarely a boat can remain competitive for more than a couple of racing seasons, the introduction of recyclable one-design boats could send a very important message to the whole community, cutting on costs and bringing back to the sport investors and sponsors keen to promote their commitment to environmental issues.

RECENT APPLICATION

Amer Yachts of Permare Group, an Italian yacht builder very much involved in eco-sustainable issues, decided to build a new generation of recyclable and eco-sustainable boats. To overcome the age-old problem of the disposal of fibreglass, it was decided to use Filava in the production chain. RINA is currently certifying the new material while the shipyard, in collaboration with GS4C, is already designing and manufacturing a part of non-structural components that will be installed on board the next hull under construction. The use of this innovative fibre will make it possible to recover all production scraps, reuse the end of life in an absolutely circular way by recycling the virgin fibre composite without lowering the physical-mechanical characteristics.

The fibre is easier to handle because it is soft to the touch and non-volatile like glass fibre. The idea of progressively being able to convert the entire production, in addition to the creation of new moulds, into this new material that can potentially be reused from processing waste to the end of its life countless times, indicates an epochal turning point for a site that has always aimed high on innovation.

This innovative mineral fibre used meets the growing needs of the Circular Economy with a European product from European raw material with a technology that guarantees repeatability and consistency of the properties.

Why we need to urgently rethink European inland waterways transportation

By **Antoon van Coillie**

Antoon is Director of Blue Line Logistics, a company that has developed and operates a logistical platform for the transport of palletized goods consisting of logistical hubs combined with small inland waterway vessels/ barges, called Pallet Shuttle Barges or PSB's. This results in an efficient and flexible logistical model, similar to road haulage, applied to inland waterways navigation.

A tsunami is gathering pace that will overwhelm the inland waterway transport industry in Europe over the next 10 to 15 years and will change the maritime industry profoundly. This tsunami is called sustainability.

The present inland waterway fleet is not equipped to cope with this. Some stakeholders or companies are aware of a need for change, but their efforts are incremental and will not provide an answer in time to the coming onslaught. Regulation still allows the use of unsustainable engines, but the sustainability agenda of major shippers will force the change. And this earlier rather than later. In order to adequately respond to this challenge, there is an urgent need for a radical rethink of the inland waterway fleet: the type of vessels, the propulsion, the operations and its place in intermodal logistic chains.

Like with seagoing vessels, inland waterway vessels have grown larger and larger. As a result, the number of waterways they operate on has been reduced and the vessels have become vulnerable to low water levels (itself due to climate change). They also require large terminal infrastructures, often congested, in order to operate economically.

The design of a traditional vessel is based on maximum carrying capacity for given length and width, not for most economical use of energy per ton moved. Indeed, when these vessels were designed, energy use was not a determining factor. The problem is that, if you want to make such a vessel zero emission or at least low emission powered, you will never get low emission propulsion that is economical performant. That is why retrofitting existing vessels to become "green" is not very efficient and actually a waste of investment. Moreover, because of its need for more power, a traditional vessel using more expensive "green" propulsion cannot compete against a traditional diesel-powered vessel.

Large vessels have other limiting drawbacks. They need a lot of power even just to change course. A canal may become a confined water if the vessel is a certain size relative to the canal. Operating and manoeuvring in confined waters needs more energy as the vessel encounters a lot more friction in order to push its hull through the water. The net ton moved per KW is lower than in non-confined waters. Hence smaller vessels are more energy efficient in canals. And whilst the technology to use low emission propulsion exists in the smaller engine sizes, it does not in the bigger engine sizes.

Making a 1.500t vessel low emission is today possible. Making a 5.000t inland vessel low emission is not.

Because of the increase into ever larger vessels, there has also been an increase in underused waterways. In the Netherlands, goods can be shipped from Rotterdam to Delft, The Hague and Haarlem via De Schie, which is a CEMT class 2/3 waterway. However, a look on Marine Traffic shows that nearly all vessels on De Schie are pleasure craft. Yet, there is huge congestion on the parallel motorways the A4 and the A13.

Underusing existing waterway because of the large vessel sizes is contra-productive in the need for modal shift from road to waterway. At the same time, the number of smaller vessels is reducing in numbers and they are increasingly obsolete, most of all in their mode of propulsion. 70 per cent of the Dutch dry bulk and container fleet is on average 44 years old and even today, Euro stage 2 diesel engines are still being installed in existing vessels! Many vessel operators and even some waterway authorities act as though the world and the environment will continue as is.

And there is the issue of crews. The other disruptive and sudden change coming is the looming shortage of skippers. Most of the inland dry-bulk and container vessels are owned by solo owners, skippers that are more than 55 years old. In the short time span of 5 to 10 years, these owners will disappear, and the ownership structure of the industry will change significantly.

The rethink of our inland waterway fleet and waterways should prepare the industry for these changes. Instead of thinking or wishing that nothing will change, or going for small incremental and ineffective developments along well-trodden paths, or installing unsustainable engines because it is still allowed, or paying lip service to sustainability and carrying on as usual, all stakeholders should on the contrary prepare the industry for this disruptive change. If not, there will be a reverse modal shift and a social bloodbath.

The solutions are here: adapting with a sense of urgency the laws, rules and regulations to allow for change, using smaller vessels, using low or zero emission powertrains, autonomous vessels, modernising the infrastructure – which does not mean building larger infrastructure, but infrastructure that operates 24/24 – 7/7, even automated – re-activating the use of the smaller canals through effective maintenance of these waterways, stimulate or even enforce the use of traffic planning, using digital systems for all sorts of relevant data unfettered by erroneous GDPR restrictions, setting up a fund for retiring obsolete vessels and so on.

This not only will prepare the inland waterway industry to be ready for the coming tsunami as such, but it will also have a huge leverage effect on the European economy, as this will entail new vessels, equipment, maintenance and so on. It will spawn new industries and it will have the needed effect on the sustainability of our logistic chains.

The question to ask is: as major shippers are more and more subscribing to the international sustainability targets, not by 2050 but by 2030, will these shippers use logistic chains with links such as inland waterway vessels if the modus has not responded to the challenge of sustainability and has not adapted itself?

LEGAL OPINION

Limitation of liability: Who is an 'Operator' and who is a 'Manager'

This article, written by Ian Teare and Matthew Dow of Law Firm, Wikborg Rein, discusses the judgment handed down in the Admiralty Court on the case of the Stema Barge II, and looks in detail at the scope and meaning on the Limitation Convention 1976. In determining the meaning of 'Operator', it was necessary for the Court to also examine the meaning of 'Manager'. This is the first time that the English Court has been called upon to consider this issue which it did in some detail.

The Background

In December 2015, severe weather caused damage to the railway line which ran along the English coast between Dover and Folkestone. Subsequently, the appointed repairers contracted with Stema Shipping (UK) Limited (Stema UK) for the provision of rock to be used in the repairs. Stema UK purchased the rock from its associated company, Stema A/S. The rock was shipped from Norway in the barge, Stema Barge II, which was anchored in an agreed location before it dragged anchor in gale force winds in November 2016, allegedly damaging a subsea electricity cable owned by Reseau de Transport D'Electricite (RTE).

This was a limitation action arising from the above events. RTE accepted that the Registered Owner of the barge, Splitt Chartering APS (Splitt), and the Charterer, Stema A/S, were entitled to limit their liability but denied that the third defendant company, Stema UK, was entitled to limit.

The Roles of Stema A/S and Stema UK

There was a written agreement between Splitt and Stema A/S for the carriage of the rock on Stema Barge II from Norway to the UK for this project. Although the contract was not in the form of what might be regarded as a conventional charterparty, it was not challenged that Stema A/S was the Charterer. However, there was also evidence from an employee of Stema A/S that he was "an Operator" with "daily responsibility for the operation of barges owned by Splitt". This individual also followed procedures in a "Barge Operator Manual" which included the fixing of tugs, insurance, surveys at the load and discharge ports and weather routing.

Although Stema UK were the party who contracted with the main railway repairer ashore for the provision of the rock, they also had some involvement with the barge. They provided a Method Statement to the rail repairer which included matters such as the anchorage and transhipment location. They also provided a Safety Statement and other documents, including a Man Overboard Procedure. 2/4

When the barge arrived off the English coast in November 2016, Stema UK placed on board a barge master and a crew member who were operating under a shore based superintendent who was also from Stema UK. Between them, these personnel were responsible for dropping the barge's anchor and following a check list which included checking the illumination of navigation lights, the preparedness of the emergency towing wire, ballasting arrangements, the operation of the generators and monitoring the barge's position.

On the night of the casualty, although the decision to leave the barge at anchor to ride out the storm was ultimately made by the Owners, Splitt, it was based on the conclusion of a meeting on-site which included two people from Stema A/S and two from Stema UK.

On the facts, therefore, it can readily be seen that both Stema A/S and Stema UK had some role in the physical activities on and in relation to the barge. Stema UK argued that the number of activities for which they were responsible was sufficient to amount to management and control and thus they could properly be described as the Operator. In contrast, RTE argued that (i) in fact, Stema A/S was both the Charterer and the Operator, and (ii) Stema UK was, in reality, simply the purchaser of rocks who had to do certain things on the barge to take delivery and these tasks were not sufficient to make them the Operator.

Interpreting Article 1(2) – the meaning of "Operator" and "Manager"

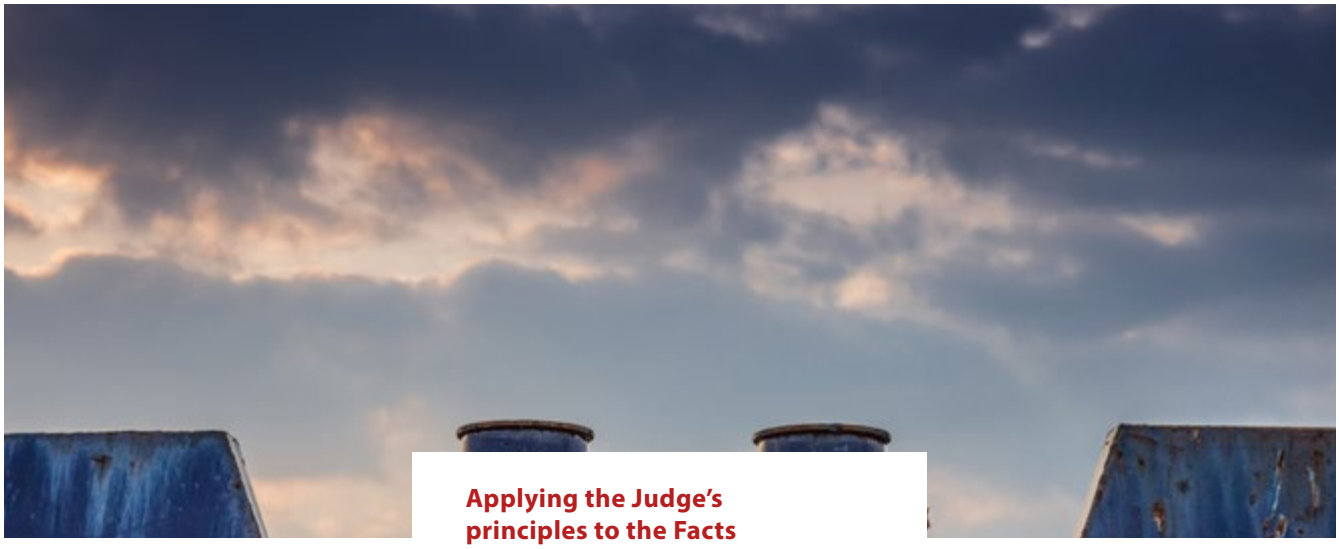
The parties took the Judge to a wide range of sources from which it was said that guidance could be taken in undertaking this exercise in interpretation. These sources included the travaux preparatoire of the 1976 Limitation Convention, the Australian Federal Court decision in ASP Ship Management Pty Ltd v The Administrative Appeals Tribunal, the wordings of BIMCO's Shipman contract, various practitioners' textbooks and industry dictionaries.

It was accepted by both sides in this case that there might be some overlap between the meanings of Operator and Manager.

The Judge concluded that the ordinary meaning of 'Manager' in the Limitation Convention is:

"…the person entrusted by the Owner with sufficient of the tasks involved in ensuring that a vessel is safely operated, properly manned, properly maintained and profitably employed to justify describing that person as the Manager of the ship. I put it that way because if a person is entrusted with just one limited task it may be inappropriate to describe that person as the Manager of the ship. A person who is entrusted with just one limited task of management may be described as assisting in the management of the ship rather than being the Manager of the ship."

In relation to the meaning of 'Operator' in the Limitation Convention, the Judge first noted that the meaning of "Operator" would include the Manager and, in many cases involving conventional merchant vessels, there may be little scope for the definition to go further than that. However, this case did not involve conventional tonnage but a dumb barge and so the Judge went further. He concluded:



"Those who cause an unmanned ship to be physically operated have some management and control of the ship. If, with the permission of the Owner, they send their employees on board the ship with instructions to operate the ship's machinery in the ordinary course of the ship's business, 3/4 they can, I think, be said to be the Operator within the ordinary meaning of that phrase, though they may not be the Manager of it."

The Judge also made the perhaps obvious observation that the fact that Article 1(2) expressly includes both the words "Operator" and "Manager" of itself suggests the possibility that there might be parties who would qualify as an Operator but not as a Manager.

In arriving at the above quoted definition, the Judge also noted that the ordinary meaning of the word "Operator" should be understood in the light of the object and purpose of the Limitation Convention. In this respect, he noted that if a dumb barge is used in an operation such as this it would have to be anchored on arrival and, ordinarily, the Owner would have to arrange for the steps to be taken to do that. It would not encourage international trade by sea, he said, if an Owner could limit its liability for losses which arose through the negligent performance of that task but that a third party engaged for the same tasks could not.

Applying the Judge's principles to the Facts

It was clear that Stema UK could not be considered to have been the Operator at any stage prior to the barge's arrival off the English Coast. It was also clear that Stema A/S retained some operational role after the barge was anchored. However, the Judge recorded that once the barge arrived on site, Stema UK had "a real involvement" with the barge, including anchoring and ballasting. The only personnel who went on board while she was at anchor were employees of Stema UK. Of equal, or perhaps even greater, significance was that while the ultimate decision to leave the barge at anchor on the night of the casualty was taken by the Owner, Splitt, it was a decision based on the advice from Stema UK personnel on site.

Taking all of the evidence as a whole and in the round, the Judge found that the nature of Stema UK's operation of the barge during the relevant period was such as to make it appropriate to describe them as the Operator and thus entitled to limit their liability.

In reaching the above conclusion, the Judge rejected RTE's argument that the use of the word "the" ahead of "Operator" in the Convention suggested that there could be only one Operator. He did also note, however, that the facts would have to demonstrate that, as in this case, the division of operational tasks was sufficient to make it appropriate to describe both parties as Operators.

Observations

Whilst, on the face of it, this case may be of greater potential interest to parties in the offshore sector than the conventional blue water fleets, as RTE discovered in this case, in the world of marine casualties one can never choose who or what you may, quite literally, come into contact with so it ought to be of general interest.

While the judgment provides a comprehensive and, one might say, common sense analysis of the Limitation Convention, it raises the obvious question: how many tasks (and perhaps of what nature) does it take to be an Operator? In this case, that appears to have been a relatively easy decision but it could be more challenging in cases with different fact patterns. 4/4

In the context of fact pattern in this case, it is worth noting the extent of detail to which the contemporaneous documents and witness statements were scrutinised by the Judge in arriving at his conclusion. There was no single piece of evidence which alone pointed definitively towards the conclusion which is why the Judge was at pains to say that he was "taking all of the evidence as a whole and in the round". This approach is worth keeping in mind at the evidence gathering stage of any future casualty which has the potential to follow a similar path to this case.

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WAKASHIO:

How the crisis communications could have been better handled

By **Dustin Eno**, Chief Operating Officer, Navigate Response

Dustin has over 12 years of communications experience including as the head of crisis communications for the largest wildfire management centre in British Columbia, Canada. Dustin has a Bachelor of Arts and Sciences degree (BASc) specialising in audience engagement and political rhetoric and a master's degree in communications (MSc) from the London School of Economics (LSE). As Navigate Response's Chief Operating Officer (COO) and Crisis Response Manager, Dustin manages the media response for numerous shipping incidents, coordinates the operations of our global network and is one of the company's lead media trainers. In addition to his crisis communication experience, Dustin has a background in public relations and has held several positions on the boards of directors for charitable organisations. Dustin is also an award-winning workshop presenter and public speaker. For more details go to **https://www.navigatepr.com**

In this article Dustin explains how a better strategy could have lessened the damage of the MV Wakashio grounding.

A large vessel aground on a coral reef spilling oil into enticing turquoise waters is always a huge problem. But, in the case of the MV Wakashio, a better communications strategy could have lessened the damage done to the reputations of the companies involved and to our industry.

The MV Wakashio, an unladen bulker, ran aground in Mauritius early in the evening on 25 July 2020. Pictures started circulating quickly, but intense media coverage only started two weeks later when fuel oil started leaking from the vessel. Over the coming weeks the story remained high-profile with frequent spikes in coverage associated with developments ranging from dead dolphins washing up on the shore to the vessel breaking up.

As happens all too often in our industry, the media and communications response was insufficient at several steps.

Communications should have started much sooner. By the time the charterer and the owner released statements on their websites (two weeks after the initial grounding), public perception and anger had already formed. Locals were widely quoted as saying they'd been abandoned by the company and government and had no choice but to take the clean-up into their own hands. The government, in partnership with the companies, should have taken a clear communications lead and proactively engaged with the community from day one.

Better coordination of messaging was needed. It often appeared the parties were not working together. For example, at one point investigators reported that the vessel had sailed near land seeking Wi-Fi. However, local police directly contradicted this claim saying that they wouldn't have needed to come so close to get a signal. On its own this

Photo credit: IMO - https://www.flickr.com/photos/imo-un/50237544366/

inconsistency isn't serious, but the failure to coordinate information and messaging eroded trust in those who were supposed to be responding to the situation. This is one of the reasons that the US uses a Joint Information Centre (JIC) and a lead public information officer (PIO) to focus the communications for major incidents.

The tone of the communication should have matched the audience. Two key things were often missing. Firstly, empathy for those directly impacted expressed in a way that resonated. It should be noted that the owners apologised publicly, but the tone of the apology was more suited to a Japanese audience (where the owners are based) than to a Mauritian or global audience. Also missing were quotable key messages which would have helped ensure a share of the media coverage for those responding. Those who were leading the response and actually knew what was going on were quoted less than critics and local volunteers who reportedly cut off their hair to use as an absorbent in a desperate attempt to clean up the oil – which made a great headline.

Accurate information and context should have been better distributed. Throughout the incident leading media outlets reported many of the simple facts incorrectly, including frequently referring to the vessel as a tanker. A tanker is scarier than an empty dry bulk vessel and this is just one of many facts that weren't reported correctly. Some may see this as a sign of sloppy journalism (and that's partly true), but it's also a sign that no one was communicating effectively with the journalists and that's the fault of the parties involved and of our industry at large.

The company should have focused on how others were impacted (not themselves). On 11 August as 1,000 tons of oil were leaking into the sensitive marine environment, Reuters news agency quoted the charterer as saying, "it doubted whether the incident would have a large enough impact on its earnings to warrant issuing a disclosure." I fully recognise that the charterer has an obligation to its investors, but this sort of statement has no place in crisis communications, even if, and perhaps especially if, it's true – those who are suffering don't want to hear that the company involved is unimpacted.

The(limited) social media strategy should have matched the tone of the medium. Nas Daily, a Facebook influencer, posted a video focused on shipping. Full of sound bites, key messages and personality (all the things that the communications response to the incident were missing), the video was viewed millions of times. Nas Daily did not focus on the shipping companies, but rather on the flag state of Panama saying: "People chose Panama because it's too easy" – implying that companies can get away with lax safety standards. To their credit, the Panama Ship Registry responded on social media, but unfortunately they fell into a common trap – they did not respond with empathy (only one paragraph half way through the statement expressed regret) and instead focused on denying the allegations made -- "the shipping industry is not unsafe, ships…are not dangerous" Let's not forget the quote attributed to 19th Century German chancellor Bismarck who said "never believe anything until it has been officially denied." Within our industry we know that Panama is a well-respected flag, but sadly the tone of the response will not have helped portray this to Nas Daily's audience. When attacked on social media, any response must not appear overly defensive (even if such is justified).

Communicating effectively for an environmental disaster is incredibly difficult. It depends on multiple groups working together and understanding the cultures and perspectives of the audiences that need to be reached. Yes, it's easy for me to sit at my computer and criticize. That is not my aim. My aim is to say to everyone in our industry, we must all do a better job of communicating about our industry because, if we don't, people will believe Nas Daily when he says: "Ships – they are more dangerous than we think".

Photo credit: IMO
https://www.flickr.com/photos/imo-un/50236896003/

IMO in hot water

following Mauritius oil spill and botched Wakashio salvage operation

Photo credit: IMO
https://www.flickr.com/photos/imo-un/50237544196/

By **Nishan Degnarain**

Photo courtesy of the Mauritius Times

A Development Economist, Nishan Degnarain is focused on Innovation, Sustainability, and Ethical Economic Growth. He is Chair of the London School of Economics & Political Science's Ocean Finance Initiative, is a member of WEF's Global Expert Network, and a member of CCICED's China Council. Nishan holds degrees in Development Economics from Harvard University's Kennedy School of Government and University of Cambridge.

This is a shortened version of a longer article published in Forbes Magazine and is reprinted here by kind permission of the author. To read the article in full see **https://bit.ly/2FAybgl**.

Editor's comment. Whilst IIMS takes a politically neutral stance always and does not necessarily agree with the author's opinions expressed in this article, it is an explosive and emotive piece of writing that will cause distress for some and provoke anger in others. It makes accusations as to where the fault lies, but those accused have not had the opportunity to respond to the allegations or defend their positions. The article raises more questions than answers. IIMS has no desire to pick a fight with IMO. I thought hard whether to publish the article or not, but on balance felt it important to share it with readers of The Report Magazine as it poses wider questions for the maritime world to ponder. And clearly there are issues for IMO to address and lessons to be learned. Ed.

The Wakashio is not the only wreck in Mauritius. Saying this has not been the finest hour for the global shipping regulator, the UN's International Maritime Organization (IMO) would be a significant understatement. Following the incident when the Panama-flagged, Japanese-owned vessel ploughed straight into Mauritius' largest and oldest coral reef system, questions are being asked about the role and effectiveness of IMO.

The IMO was supposed to be the best face of the maritime industry - representing a cleaner, greener, more transparent, responsive and gender-balanced future of global shipping.

In the year that six major UN agreements were to be signed to give greater protection to life in the ocean, one would have thought that a major oil spill amid the fragile coral reefs of a global biodiversity hotspot and high profile tourist destination, would have attracted some of the UN's best scientists who recognized how important these unique species and ecosystems are, and would have worked night and day along with the Mauritian volunteers who were solely focused on protecting their island's unique heritage.

Instead, Mauritius received representatives from the oil industry who acted on behalf of a UN agency - the IMO - shutting out local talent, and have been behind a series of increasingly catastrophic interventions that has now led to the loss of four local crew in Mauritius (three confirmed deaths and the captain still missing), the carcasses of almost 50 whales washing up on the Mauritian shoreline, 30km of heavily impacted oil-drenched beaches, a 300m iron ore carrier being deliberately sunk in an unknown location off the coast of Mauritius, and the 75m high stern of the vessel protruding like a giant tombstone on the once pristine coral reefs of Mauritius with no clear plan of how and when this will be removed, as the corals below are ground away each day with the strong currents and the supporting chains from the salvage operation.

Where did it all go wrong?

Here are four factors that could have contributed...

1. IMO Mission Creep

24 August 2020: a date that will go down in infamy in Mauritius' history books for the deliberate scuttling of the Japanese iron-ore carrier, the Wakashio, in clear weather and calm waters. What was the IMO's role? The IMO had a very clear mandate when it first landed in Mauritius. Focus only on the oil spill. The salvage operation was out of scope. This was agreed with the Government of Mauritius under the framework of the International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 (OPRC 90).

Salvage was the responsibility of the Japanese P&I Club and the two salvage organizations they had engaged - SMIT Salvage and Nippon Salvage.

As the Wakashio split in two on 15 August, mysterious sediments and liquids mixed with the normally turquoise blue of Mauritius' coral lagoons in the Indian Ocean. This was 9 days after oil started gushing out from the stricken vessel.

The separation of responsibility for those handling the oil pollution from those handling the salvage operation is a critical distinction for maritime insurance and liability reasons. Getting this wrong would be a very expensive mistake, especially in a place like Mauritius, where it is now believed that the ongoing salvage operation itself (46 days later) could have been just as damaging as the pollution from the oil spill.

On 21 August, as the Wakashio was being controversially towed toward a mysterious location, a spokesperson from IMO Headquarters in London was very clear on the terms under which the IMO was operating in Mauritius, specifying, "The IMO expert's role is to provide advice specifically on oil pollution response matters."

The Headquarters spokesperson went on to clarify to Forbes that, "the IMO advice is limited to advising on oil spill response and mitigation

measures, whether from the bunker fuel or any other potential risks of pollution from any other type of oil remaining on board, such as the lubricating oils already mentioned. Measures are in place for an immediate response, should there be further leakage from the ship."

On whether the IMO's representative could advise on or endorse the decision to scuttle the Wakashio at the location that was decided upon, the IMO Headquarters spokesperson was very clear that this "was not in the scope of work."

The IMO Headquarters was very clear that its mandate did not extend to any actions related to the scuttling of the Wakashio. However, in a televised press conference to the Mauritian media while sitting next to the Mauritian Commissioner of Police on 21 August, the IMO representative to Mauritius, said the following:

"It was a planned sinking - the decision what to do with the ship. The ship broke into two pieces. One of those pieces - the bow section - was on the reef and starting to move around. If she had been left there, she would have done more damage to the reef. So, she has to be moved. Options were looked at. Take her off, and then what do you do with her? For a long-distance tow, the ship was going to need some further repair work. Maybe 10 days. Where do we do that?"

It is important to note that the Government of Mauritius statements issued soon after the vessel had split in two on 15 August said there was no longer any oil in the forward section of the Wakashio. In the press conference on 21 August, the IMO representative went on to evaluate each of the five potential sites that had been identified by the Government with the salvors to tow the vessel for repair work.

"Each one of them was somewhere round Mauritius. Each one of them meant taking that piece of the ship to somewhere else around the country that hasn't been affected, bringing a risk during the tow, a risk while it was there. Those options were looked at, considered and said, 'not good.' Options for sinking the vessel were considered. Initially three locations were identified where the waters were deep enough but were in the territorial waters of Mauritius. They were considered. Further advice was taken. Some of that further advice came from neighbouring countries. Reunion had some requests regarding the position. Wildlife considerations were taken into account… In the end, a fourth location was identified where the planned sinking could occur."

On the specific location of the sinking, the IMO representative was very clear that, "The position has been chosen because it is somewhere safe to deliberately sink the vessel. So, it's a very considered thing that's gone on."

Once more, he emphasized that, "Leaving her where she was, was not an option. Moving her somewhere for a number of days was not an option. The option left was the one that's been taken. We have this thing in oil spills we talk about called the 'Net Environmental Benefit Analysis.' Effectively, that is what has been done. We looked at the options and said what is the impact of each one. And this one was the one that has been chosen as being the best option."

Within 24 hours of the sinking of the Wakashio, 18 dolphins and whales washed up dead on Mauritius' beaches. Within five days, there were almost 50 dead whales and dolphins.

Although the press conference mentioned measures that were taken to remove items from the Wakashio, there has still been no independent verification of what materials had been removed and what was left on board. The IMO rules set out very strict procedures and documentation that must be completed before anything can be dumped in the ocean. This documentation has not been disclosed.

There are only two scenarios under which an IMO representative should have been talking about a decision to deliberately sink the front of a large vessel under the mandate of an OPRC.

- That oil was still on board the vessel. This would be in line with the OPRC agreement that is limited to only evaluating the risk of oil, or

- A new agreement had been signed requesting that the IMO expand its scope to now cover salvage operations (including the decision to deliberately scuttle a large vessel that had not been fully decontaminated).

Despite repeated questions to the IMO by Forbes, no such amended agreement between the IMO and Mauritius has been publicly disclosed. The IMO is supposed to be a transparent UN regulator. Such agreements should be in the public domain for the public interest.

The mission creep of the IMO from oil spill response into salvage advice would be considered a material expansion of its role. This has been - by a long margin - the most controversial environmental decision ever taken in Mauritius' history and thousands of protestors on the island have been calling this an ecocide. This was not a small oversight for the IMO to have overstepped its mandate and ventured into the salvage and scuttling side of the Wakashio.

It would be seen as a significant conflict of interest for the IMO - who sets several important maritime pollution laws and standards on maritime pollution and laws governing whether a ship can be deliberately sunk at sea (specifically, Marpol Annex V, Ballast Water Management Convention, International Convention on the Control of Harmful Anti-fouling Systems on Ships, and Hong Kong Convention on the Safe and Environmentally Sound Recycling of Ships among others) - to be

seen to be endorsing a decision to deliberately sink such a large vessel in violation of these laws.

What signal is this sending to the world for how vessels should be disposed of at the end of their lives?

2. 'Alternative' facts

As every oil spill expert in the world knows, one of the first actions to be taken following a major oil spill, is to conduct a lab test called Gas Chromatography - Mass Spectrometry (GC-MS) to analyze samples of the oil spilled in the water. It is a process that takes less than an hour, and allows the unique signature of the oil to be compared to signatures around the world so that it is clear what sort of properties, behaviours and toxicity the oil may exhibit in these sorts of waters.

Every major oil refinery has access to such facilities as they need to run GC-MS several times a day to test the quality of their hydrocarbon products. Only a small sample of this oil is needed (not more than a test tube), and this can be flown to any laboratory that exists around the world. Such a test is usually conducted within the first few days of an oil spill, so all responders and scientists are immediately aligned with what is being dealt with in the environment.

It is 46 days since the grounding of the vessel - 12 days to have conducted the test from the grounded vessel to understand the risks before the leak, and 34 days since the leak to understand the behaviour of the oil along the coast of Mauritius. Not having this test is the same as flying the clean-up operation blind. It is that serious an omission. This was supposed to be part of the core mandate of the IMO involvement - managing the oil spill response under an OPRC. Why hasn't the IMO made this analysis available so the best minds in the world can start working to safeguard this important biodiversity? It may even be considered negligence if such testing was not taking place to universally established international standards.

Conveying accurate information about the oil spill to a nervous island population who have never gone through anything like this before, is a basic expectation of any UN body, especially when reading the original charter upon which the United Nations was founded, and which guides the IMO. In this charter, it is clearly stated that international machinery should be employed "for the promotion of the economic and social advancement of all peoples." However, public presentations and information by the IMO have been troubling and raise questions whether it is meeting these UN founding objectives

In a meeting with leading local business leaders, civil society leaders, and the media on 1 September in Mauritius, the IMO representative appeared to be giving health advice on the placebo effect of 'tasting oil in fish.' In responding to a question 27 minutes into this video at an event hosted by local industry body, Business Mauritius, the IMO's representative flippantly remarks, "the biggest killer of fish is fishermen," while discounting the very real risks of a major oil spill that has been shown to cause cancer in many parts of the world.

Indeed today the latest report from the Government of Mauritius reveals that all fish from South East Mauritius is not fit for human consumption, as harmful cancer-causing PAH chemicals as well as hydrocarbons have been found in samples revealing arsenic levels 500% to 700% above normal.

Does the representative - speaking on behalf of the IMO - have the appropriate medical qualifications to be making such statements or attempting to filter standard medical procedures following a major oil spill?

Mauritius has a biomedical hub on the island, and yet many of the tests that have been called for have not been undertaken. It could be considered highly irresponsible for the UN's global shipping regulator to be making health or biodiversity clean-up recommendations to the local media of a country, without having conducted large scale, full toxicity tests on fish in a systematic way along the coast. MAH and PAH are cancer-causing chemicals and have already now been found in the local seafood.

This is not the time or place to be playing with people's lives or unique biodiversity. There are scientists in Mauritius with deep expertise in these fields who are not being consulted. The IMO should be taking its responsibilities seriously, and perhaps inviting experts from the UN's World Health Organization to address such health risks for major oil spills.

Equally troubling was a presentation on financial compensation given to local business leaders. This was supposed to be a fact-based presentation from the IMO, and yet there are clear inaccuracies and a feeling that the advice was being presented in a simplified way as either a fast or a slow path to compensation. Why would an IMO representative be pushing to fast-track claims and setting low expectations, as if this is a used-car

insurance salesperson? This is the largest ever oil spill in Mauritius' history at a site of immense historical and natural importance to the country. Where is the discussion about the IMF relief fund or bank loans to pay out a portion of the claims immediately while any court process goes on (with interest rates close to zero, this would appear to be the most attractive path forward). The salvage agreement was a Lloyds Standard Form of Salvage Agreement (LOF), signed on 26 July, a day after the grounding. This means that any such settlement is likely to be decided in an Arbitration Court in London.

As an international shipping regulator, it is the IMO's duty to be providing the latest and most accurate information to scientists, conservationists and citizens trying to understand what they are dealing with, as well as transparent information on international law and any financial implications.

Protests in the country against the Government should not change the fact that UN organizations need to be politically independent and fact-based when in a country experiencing a major oil spill, like Mauritius. The citizen protests are well organized, peaceful and are being scheduled two weeks apart. Clear misinformation by the IMO is aggravating the local situation and lack of trust with public institutions in the country.

What's been seen so far in Mauritius does not build confidence in the decisions or actions taken by a regulator that decided to opt-out of the Paris Agreement and ask citizens of the world to blindly trust them to self-regulate and lead the world into a cleaner, safer and climate-friendly future for shipping. A pattern from the lack of oversight is starting to emerge.

3. Dismissing local talent

Many islanders in Mauritius have been offended by how local expertise has been dismissed for expensive international consultants who do know have the knowledge, expertise or commitment that locals have, and even worse have made inaccurate statements, without being held to account.

What has been even more troubling is the implications that the IMO may be filtering international offers of assistance from other countries to Mauritius. In a series of videos featuring the IMO representative, he says that Mauritius "is overwhelmed" and implies that the IMO could be the judge of what international assistance or technology should be received.

Many Mauritians have been shocked by these comments, as citizens from any country affected by an oil spill, whould be by hearing such comments from an international shipping regulator. All the skills that Mauritius needed to run a world class national response existed within the country and among a well-educated diaspora, each with deep domain knowledge on what to do for each workstream in a national oil spill response.

Why was (and is) this talent being rebuffed?

Mauritius even has a former President and Professor, Ameenah Gurib-Fakim, who is a world-renowned Biodiversity Scientist. This is a major oil spill that is impacting some of the world's rarest species. These species have never been exposed to the toxic chemicals contained within ship engine fuel and it should have been obvious to any international oil spill response team to meet with the leading scientific figures of the country to understand the potential risk to this fragile ecology. Instead, Dr. Gurib-Fakim has been appealing for international scientific assistance on specific areas of biodiversity support for weeks. It would be troubling if this international assistance is being blocked by the IMO against the wishes of such local biodiversity scientific expertise.

The former President of Mauritius has also been highly surprised that she has not yet been approached by the IMO representative who is coordinating the oil spill clean-up, given that she is one of the world's leading scientific authorities on Mauritius' rare biodiversity, and she herself has been spending time on the front lines cleaning the oil, helping sew homemade protection booms, and is intimately familiar with the unique species found on that part of the island.

In an interview with Forbes, the former President of Mauritius, Ameenah Gurib-Fakim, has called for more extensive and specialized monitoring of the important coral reef and mangrove habitats. She said, "The world has talked about the importance of standing up to climate change and biodiversity loss, yet here we are on the front line of both - a fossil fuel being dumped into a fragile biodiversity hotspot of coral reef. I have called for specific support and independent science to ensure the clean-up operations do not cause even more harm than the initial oil spill.

This has not happened. I do not know why. We also demand greater accountability of the international organizations operating in Mauritius. There is the knowhow within Mauritius on how to respond to this oil spill, but we need independent scientific support. Countries have

offered to help, but it appears the IMO and others seem to be blocking their help.

If that is the case, that is very serious indeed. The IMO representative has not even met with me or other leading biodiversity experts on the island in the 46 days since the grounding of the Wakashio."

For a UN regulator to step in between a host nation's and former President's (and a biodiversity expert at that) call for international assistance, and the response from other nations who had offered their support, is a very serious line to have crossed and could be perceived as a UN agency interfering in the domestic affairs of a country.

So why are individuals with the ability to respond to a major national crisis being ignored by the IMO?

4. A heavy gender imbalance

Women were on the front lines of the oil spill in Mauritius - in both the response and in being on the receiving end of the impact. When the oil spill first hit, it was the women who braved the waters and organized some of the artisanal booms. They were active in self-organizing the large social media groups that are coordinating the volunteer-led response. Several of the most compelling images taken of the events were by female photographers and journalists, and many women have now created environmental NGOs to respond to the rehabilitation needs and are actively coordinating international outreach for Mauritius. It is a tale of collaboration, support and humility.

When the story of the Wakashio is fully told, it will be just as much about the rise of female environmental leaders in Mauritius as it is about the disastrous handling of the ship and clean up. Was gender a factor in explaining the difference in effectiveness of decision-making?

At the same time as women have stepped up in the clean-up response, it is also women who are bearing the worst brunt of this oil spill. Many in Mauritius were moved to tears watching the cries of two women. The first was a resident of the town of Mahebourg, who stepped up to call out at the powerful ministers that were arriving in Court on private charges of negligence for their response to the Wakashio disaster. She shamed them into asking what they had done to her historic town where she relies on a simple income from lagoon fishing and asked how she was now supposed to make ends meet. This encounter was prominently featured in national newspaper, L'Express. The second was a set of two interviews, first with the wife and then the elderly mother of the still missing captain of the sunk Mauritian tugboat where the bodies of three of his eight crew have been found. They were both was interviewed by national media organization, Defi Media. You do not need to understand Mauritian creole to hear the pain in all of their voices.

Interviews with women in the medical journal, The Lancet, by Dr Sima Barmania, also reveal greater fears among women about what risks this oil spill means for them. The journal cites local Mauritian, Carina Gounden who was involved in the clean-up and described her symptoms to The Lancet, "I was in a state of confusion, unable to focus, finding it difficult to breath. I was not the only one." In other oil spills, there are usually more concerns from those who are pregnant, who are concerned about what the risks of ship engine fuel poses to their unborn babies.

Many who live in the smaller fishing villages like Bois des Amourettes spend their days on the ocean and sit cheek by jowl with the large, sprawling 5-star hotels where some may find work. Yet it is these hotel groups and the powerful business lobby behind them who have been pushing a marketing campaign to brush aside many of the health concerns of these poorer Mauritians, that many are finding distasteful in Mauritius. One week's stay in one of these five star hotels costs more than what many of the villagers living just beside them make in a year. These are the villagers who are on the front lines of the oil spill and have nowhere else to go.

Photo credit: IMO
https://www.flickr.com/photos/imo-un/50237761237/

But despite this oil spill having a clear gender impact, many Mauritians were stunned by the insensitivity of this by international organizations tripping over themselves to 'help' the island without once speaking to the islanders, who had organized themselves effectively in several large social media groups. Even more revealing was the gender breakdown of the teams that these international groups were sending into Mauritius.

At the last count, there were 16 international organizations that have been publicly identified as being involved in the oil spill response. They were each approached to provide basic information on gender balance of the team and policies that their organizations had put in place to ensure a more balanced gender impact.

Surprisingly, of the 79 international consultants and 'experts' who have been flown into Mauritius, not one has revealed any female participation. Having seen how prominent a role women in Mauritius played in responding to the oil spill, and even though this oil spill clearly has a disproportionate impact on women, could it really be true that all these organizations were unable to find suitably qualified candidates?

IMO Meetings at the London Head Office are a largely male affair. Even the literature put out to ensure a more level playing field for women acknowledges that this is still a heavily male dominated industry. That would be very uncomfortable for an organization that made 'empowering women in the maritime community' one of its big themes last year.

Looking at the IMO response to this major environmental crisis, one wonders whether such gender equality efforts have been more marketing than substance.

The IMO is governed by an Assembly, made up of all member states, which elects a 40-Member State Council. This 40-member Council is the executive organ of the IMO where the most critical operational decisions get taken. While it is true that it is for members to choose which individual delegates to send, many organizations have managed to increase female representation among delegations.

While the IMO has pointed to the delegations, they have been unable to demonstrate that these metrics are being tracked. When asked what steps were taken prior to the oil spill to ensure that other organizations being been brought into Mauritius have a more even gender balance, there was no immediate response. An oil spill response is not just an engineering solution. Oil spills have deep social, environmental, health and political dimensions.

Of the 32 representatives sent by the Japanese Government and Japanese corporate giant, Mitsui OSK Lines (MOL), not one of them is female. It is hard to believe that there are no suitably qualified Japanese marine scientists who were not interested in supporting Japan's mission, and who could bring an all-important gender lens to the Mauritius response.

The events of the Wakashio started as a shipping incident, but amid growing national protests in the country, the actions, conduct and lack of transparency over the global shipping regulator could be seen as fanning the flames, rather than building the trust, transparency and truth that the islanders of Mauritius have been demanding all along. The standard response of the industry to blame the crew - the captain of the Cosco Busan was accused of being on drugs, the captain of the Exxon Valdez accused of being drunk (and importantly overturned), and the captain of the Wakashio apparently accused of both - is a troubling development by the Panama authorities who arrived in Mauritius and immediately made this announcement.

With ships exploding, sinking and catching fire around the world, and 150 million along the Red Sea fearful of a massive ecological disaster from an aging oil tanker, surely it is time to be rethinking how we govern global shipping. If the IMO cannot be trusted to reform itself, perhaps leadership from the G20 could put much overdue order into this industry.

Global shipping is a $3 trillion a year industry. If it was a country, it would be the fifth largest economy in the world. Poor governance of such an important industry is now destabilizing countries and increasing geopolitical risk around the world.

If the narrative of the shipping industry is to be believed, it appears then we should be particularly worried that we have tens of thousands of large, unsafe ships, transporting dangerous and explosive goods, that are powered by toxic chemicals and are being crewed and captained by individuals with chronic alcohol and drugs issues – clearly not the case.

If that isn't a wakeup call for greater intervention by the G20 into the global shipping industry, then what else would it take?

When the IMO representatives themselves almost fatalistically accept that another shipping accident is likely to happen in Mauritius and that Mauritius should be prepared, rather than the shipping industry be better prepared (see 33rd minute of the video), it doesn't sound like a regulator that is serious about fixing the root causes of the problems in its industry, and saying 'never again.' The message being sent is that returns will continue to privatized by the ship owners, and risks borne by poorer taxpayers and nations around the world.

The actions of the IMO in what was once the paradise island of Mauritius has shown that this is a regulator that is out of touch and out of date.

It is the year 2020.
The world deserves better.

Making a hash of lashing

By **Neil Gardiner**

Neil Gardiner is a Master Mariner with a combined Honours degree in Marine Technology and Maritime Law. He joined Brookes Bell in April 2012 as a Managing Master Mariner. Prior to that Neil worked for a leading P&I Club, inspecting their own vessels and investigated casualties for another UK-based marine consultancy. He has over 20 years of seagoing experience, sailing as Master latterly on ice-classed panamax container ships trading between North Europe and Montreal. Neil has investigated and advised on a wide range of matters including collision, grounding, fire/explosion, personal injury, port safety disputes, pollution, speed and performance, hull damage, aspects of the ISM Code and various cargo related matters. He has acted as expert witness in court and arbitration in the UK and abroad.

"Container losses – why do they keep happening asks?" asks Neil Gardiner, Managing Master Mariner, one of the accident investigation team at Brookes Bell. Neil argues that while there are not as many container losses as is sometimes thought, those that do occur are often due to poor weight distribution, amongst other things.

Every year container ships lose containers, but it's not as many as people think. The World Shipping Council which includes the big shipping lines, accounting for more than 80% of the global container shipping capacity, reports that only around 2,000 containers carried were lost in 2019.

That's less than 0.001% of the estimated 226 million containers carried every year. But, they tend to be highly visible and high profile.

With 24 years of seagoing experience including considerable time on container ships and a degree in maritime technology and maritime law, I am in a position to give the scientific and technical insight into the transportation of all kinds of commodities carried in containers at sea.

Containers fall off ships for a number of reasons, but poor distribution of weight is one of the most common factors. In recent years, the IMO's SOLAS regulations concerning the mis-declaration of container weights have tightened control in ports considerably. Mis-declaration of contents and weights does, however, still occur and when it does it poses a significant safety risk to the vessel and crew carrying the cargo.

Brookes Bell continues to be appointed by insurers and owners to investigate container losses. On arrival at the vessel, the appointed surveyor will conduct a thorough inspection of the vessel and paperwork. They will, thereafter, investigate and record the condition of the lashings, including twistlocks and the condition of the containers. They will, thereafter, assess the condition of the adjacent container bays, the arrangement of the remaining containers, the base locks, the configuration of the lashings to

establish whether the arrangement was compliant with the approved Cargo Securing Manual.

This is where securing the containers is so important. In a boisterous seaway the vessel pitches and rolls, depending on the ship stability and the direction from where the seas are coming, these motions could translate adverse vessel motions resulting in excessive racking, compression and separation forces within the container stow.

It's not just the overall weight of the containers that can lead to a movement of stowage, but the distribution of those weights within the stack, how the contents are distributed and secured inside the container and how the ship is handled in heavy weather are key factors too.

DOMINO EFFECT

Each twistlock on a container vessel has been typically designed with a 25-tonne maximum securing load. In a bay filled with all rows of containers with similar weight distribution, the bay acts like a solid block with little relative movement. But container stacks with significant weight variations act independently, each reacting differently to the vessel's motions.

Lashing bars between the container stacks and deck are tensioned but over the course of a voyage they may loosen and need to be re-tightened.

Twistlocks and lashing bars need to be re-tightened, particularly during heavy seas when the cargo moves more.

All very well in calm weather, but in bad weather – when they are needed even more – it simply may not be possible for the crew to do this. If the tension is not maintained, one stack may move more than the adjacent stack and a slapping motion may develop. Over time, in the 'right' conditions this can have a domino effect, one stack leans against the next, overloading its securing components, until the whole bay becomes unstable, and overloading the securing arrangement such that the container stack(s) topple.

It might be that just one container at which a structural component has failed. The strength of a container is in the corner posts and structural rails and if one aspect fails, it can lead to the collapse of the entire stack. Any weak points in a container structure become critical when they have, at times up to 10 containers secured above.

UPDATING CLASS RULES

The container industry has changed significantly over the last ten years, with the trend being for larger and larger vessels. Classification Societies set the rules for vessel loading configurations, but with partial loading and discharging of the bays at various ports, vessel stability on a voyage can vary dramatically. This can and does on occasion translate into a sub-10 second roll period that can generate dynamic lashing forces that are far greater than what the lashing system was designed to withstand.

Where isolated container stacks may be a requirement between ports, the effect of severe weather can be more profound. By example, in the North Sea, weather conditions can change quickly and the relatively shallow sea (30-35m deep) can at times produce treacherously short and steep waves, alternately in the Far East during typhoon season this can produce a whole range of extreme weather conditions and difficulties when trying to reduce movement of the vessel in a seaway.

In 2009, a paper published by Marin, Lashings@sea examined the forces experienced on a container ship using fitted sensors. It revealed that many Class Rules are based on assumptions not reality. The modern, bigger ships are more flexible and container fixings need to be similarly responsive.

The Marin research found that with a ship in a head sea, the slamming motion can pass along the length of the vessel as a travelling wave through the hull. When this wave reaches the aft end, the lighter structure shows peak accelerations of similar amplitude to the original slamming forward. This can increase the loading on a container's lashings by 40-50%, but it remains unclear if all the classification societies calculate or currently allow for such additional forces when approving the Cargo Securing Manual that the crew must use to assess the container stowage before each voyage.

Ship loading programmes are based on assumed vessel motions at a predetermined GM value by the approving classification society. Unfortunately, when adverse weather is encountered it is not unusual for the parameters that the stowage is being assessed against are exceeded.

At the end of the day, it's about getting the basics right. The container weight (VGM) needs to be verified before loading plans are developed and thereafter the vessel's crew must follow the loading plan and check the loading weights are in line with the Cargo Securing Manual.

In every incident I have investigated, the ship has had loading software, but it has not always been used to its fullest extent. Before entering port, the vessel would likely receive the proposed loading plan.

This should be put into the loading computer and checked for compliance and where anomalies are found with stack weights, poor weight distribution and potentially excessive lashing forces against the Cargo Securing Manual criteria and/or stability these need to be immediately raised with shore planners and amendments to the loading plan made.

What is AIS
and how does it work?

With more and more leisure boats venturing further from their local shores, safety is paramount. Leisure boat users may be sailing in the same waters as large commercial vessels and will need to have their position and information noted to avoid any collision. This is what AIS (Automatic Identification System) does.

How AIS Works

AIS works by taking your position and movements via the vessel's GPS system or an internal sensor built into an AIS unit. That information is then collated along with programmable information from the AIS unit (e.g. Maritime Mobile Service Identity (MMSI) number, vessel name, destination, cargo type) and is transmitted in the background at regular intervals whilst also receiving other vessels AIS information. The AIS unit can have its own separate antenna or an antenna splitter can be used from the antenna the VHF radio transmits from. If an antenna splitter is used, it must be an active splitter suitable for a VHF radio and AIS transponder. AIS information provides an overview of every large and potential hazard transmitting via AIS relative to your own vessels' position. This will be displayed either on a chart plotter showing the positions of the other vessels or on a radar display. Depending on the type of chart plotter or display you are using, you can have the option to select the other vessels information to view their MMSI number and call them directly through the VHF radio.

Shore based stations also have equipment that receive AIS transmitted information and display it on an electronic chart showing 'traffic' within the waters near them. These stations can monitor the vessels and provide added safety as they have the ability to call ships directly and warn them of potential hazards.

AIS Classification:
There are 2 types of AIS classes used by ships, Class-A and Class-B.

Class-A:
This class is used by commercial ships and they operate on 12 watts while transmitting their information typically every 2 to 12 seconds (depending on speed or if at anchor) with a range of 20 miles or more if the right antenna is fitted high enough. *

Class-B:
This class is used mainly by leisure boaters and operates at a lower 2 watts, broadcasting less frequently (roughly 30 seconds) and has a range of 5 to 6 miles. *

**Transmit range only. Receiving range will vary.*

Type of information transmitted:
AIS transponders typically transmit the following information

- Vessel name, MMSI number and call sign
- Type of vessel (such as passenger, cargo, fishing)
- Vessel's position (current latitude and longitude)
- Course over ground (COG)
- Speed over ground (SOG)
- Heading from your vessel
- Closest point of approach (CPA) (distance)
- Time to closest point of approach (TCPA)
- Vessels' dimensions (length, beam and draught)

Please note, type of information transmitted may differ from Class-A and Class-B transponders.

"AIS works by taking your position and movements via the vessel's GPS system or an internal sensor built into an AIS unit."

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Other Uses For AIS:
AIS has uses other than just for collision prevention. Fishing fleets can contact other vessels within their vicinity to warn of trailing fishing nets and suggest course corrections to avoid entanglement.

AIS can be used in personal locator beacons for members of a ship's crew. If a crew member was to fall overboard then a small transmitter worn by the crew would activate. Their boat or another vessel will then see the bearing and distance to the person in the water as the AIS information will be displayed on their navigational equipment.

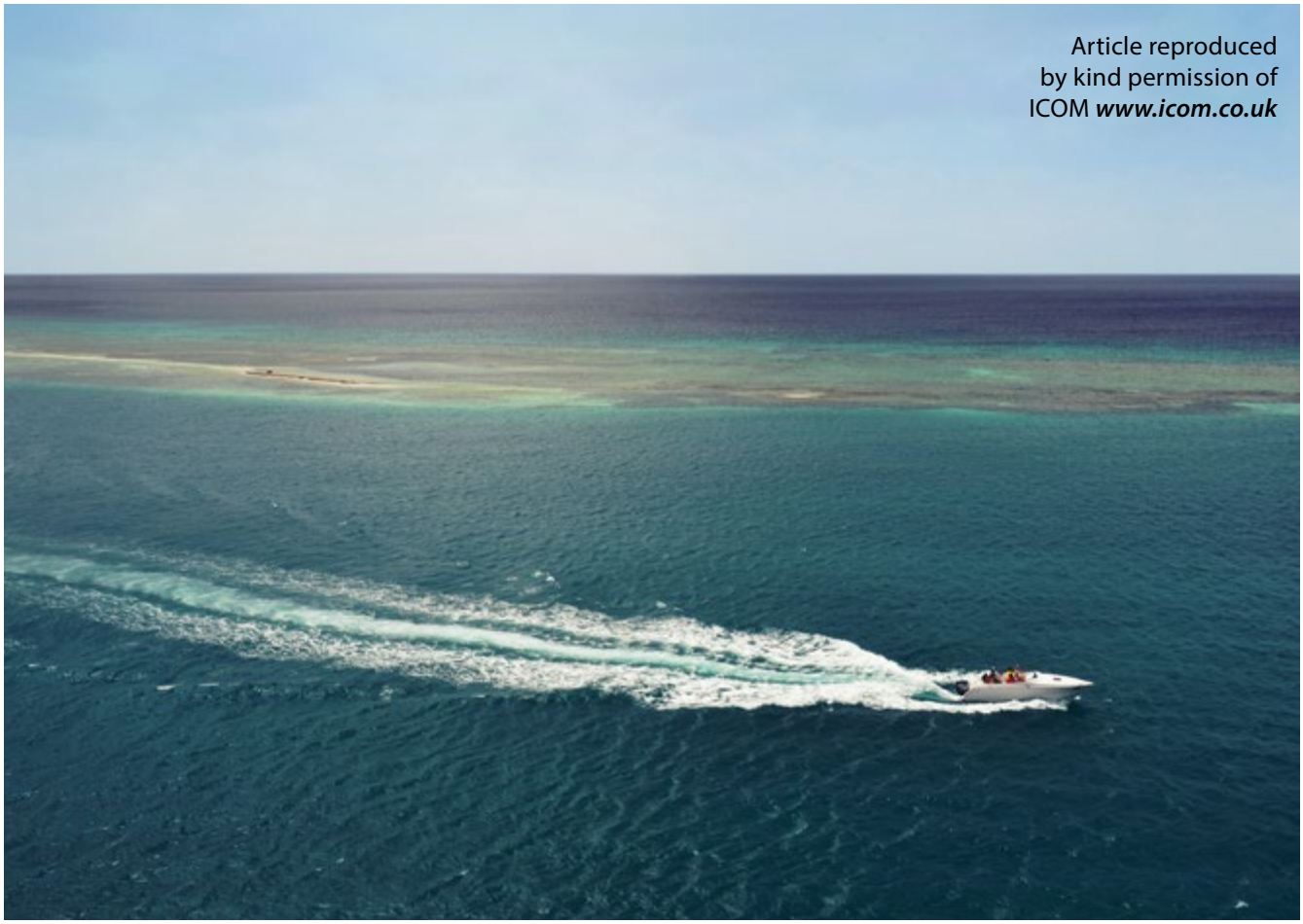
Also, anyone can track ships via AIS on the internet via such sites like http:/www.marinetraffic.com. On a commercial side, ship managers can track their fleet of ships when at sea. On a leisure side, a relative or friend of a person who is sailing could arrange to meet up at a port or marina close to their current position or just check on their progress.

Conclusion:
AIS is very reliable as it transmits the GPS location including SOG and COG. AIS also transmits a boats' specific MMSI number and the vessels name allowing personal contact by Digital Selective Calling (DSC), avoiding vague descriptions (e.g. "ship off my port bow"). This can help to give warnings of close proximity or course corrections. Where visibility is low, AIS can be a great aid as it works like a real time radar offering safety in these dangerous conditions.

AIS is a benefit to anyone sailing and Icom offers several AIS solutions. The MA-500TR Class B AIS Transponder has an integrated 2.7-inch display giving the boat owner real-time vessel traffic information and can be used in conjunction with an Icom VHF radio, providing individual DSC calling by selecting vessels on the display instead of manually inputting their MMSI number. The MA-500TR also offers the ability to display AIS information on a plotter via its NMEA0183 data output and GPS information from the supplied MXG-5000S antenna.

Icom also offer IC-M506EURO and IC-M605EURO VHF/DSC radios which feature AIS receive only technology. These radios integrate via the NMEA2000 data network providing seamless operation and real-time AIS traffic information and DSC individual calling. Both radios also feature the 'Danger List' function which helps you find any dangerous target whose CPA is within 6 nautical miles and TCPA is within 60 minutes of your vessel.

The new CB2000 Class B AIS black box Transponder Unit is also compatible with the IC-M506EURO and IC-M605EURO and can be used to upgrade the radios from AIS receivers to AIS transponders via the NMEA2000 data connection. The CB2000 can be easily and discretely installed due to its convenient size, simple 'plug and play' installation and requires a dedicated VHF/AIS antenna or antenna splitter.



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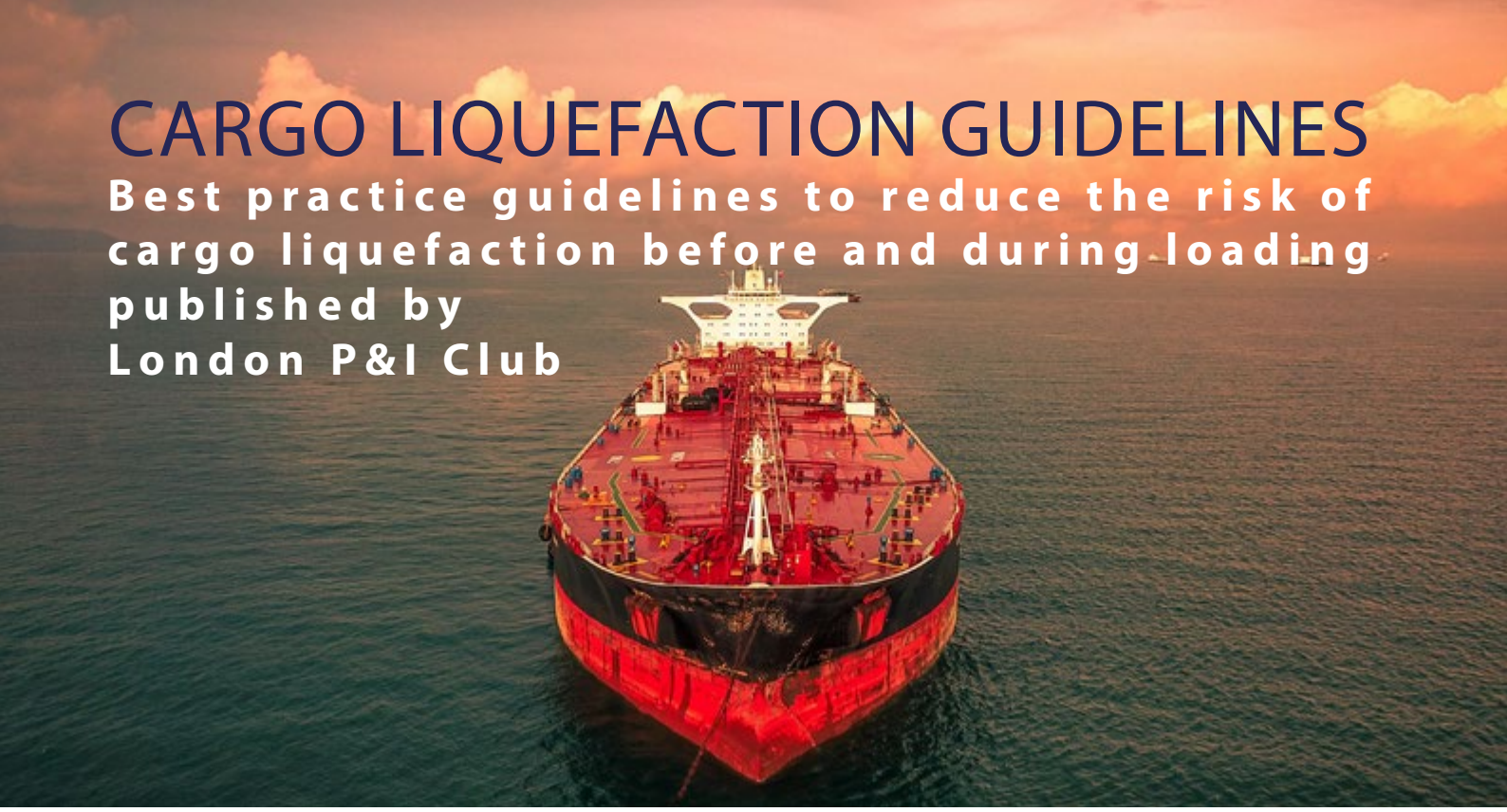
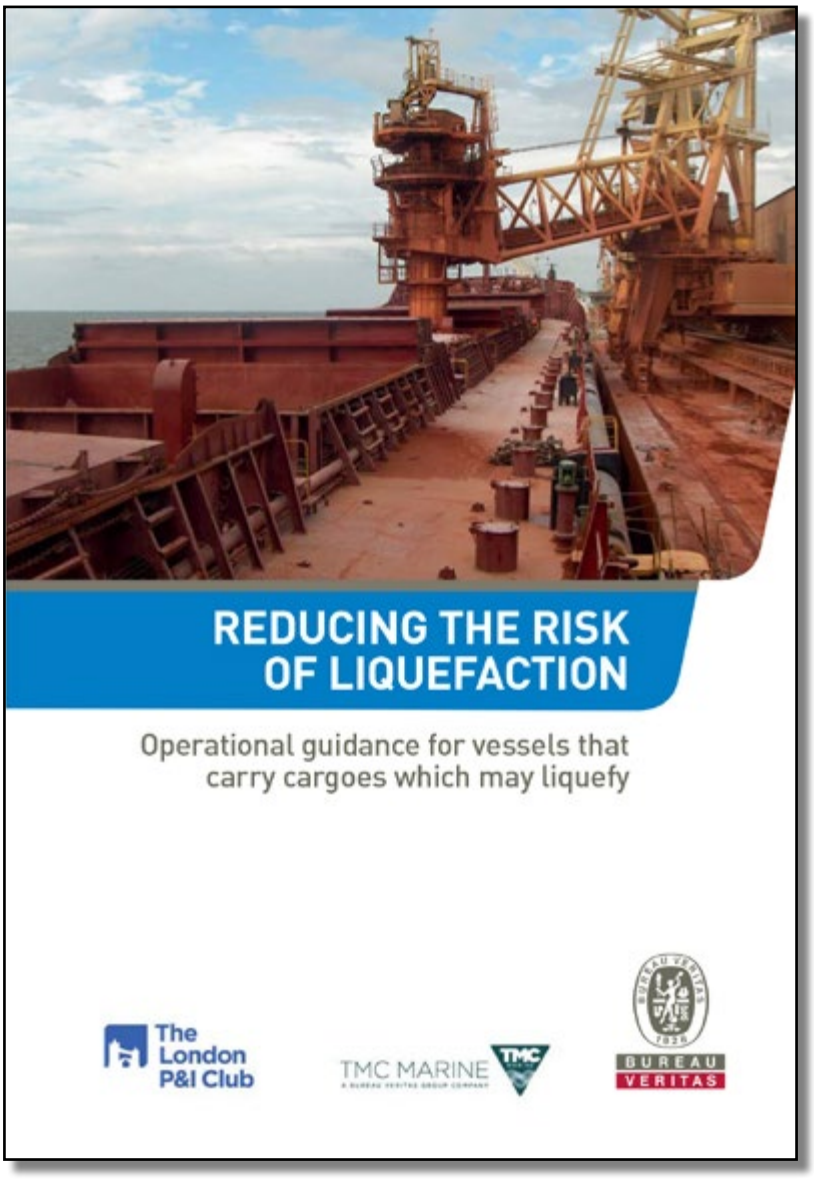
CARGO LIQUEFACTION GUIDELINES

Best practice guidelines to reduce the risk of cargo liquefaction before and during loading published by London P&I Club





The London P&I Club has published a booklet to provide guidance about the risk of cargo liquefaction. It offers practical advice on the loading and the carriage of bulk cargoes which may liquefy, and the risks associated with liquefaction, plus the precautions to be taken to minimize these risks.

Cargo liquefaction is described as the phenomenon that is triggered by an increase in water pressure that makes solid bulk cargoes (granular materials that are loaded directly into a ship's hold) turn from a solid-state into a liquid state, causing a ship to tilt and potentially capsize. It can occur when cargo is loaded into the hold – this often involves a fall from significant heights, or when it is exposed to agitation by the ship's engine vibration or movement of the waves.

Before loading

It is important that the master should not accept concentrates or other cargoes which may liquefy for loading without being provided with the appropriate documentation certifying that the moisture content of the cargo is less than the TML.

Prior to the commencement of loading the master should satisfy himself and confirm that:

– The cargo holds are clean and dry, and the bilges have been tested.

– The hatch covers close correctly and are weathertight.

The following should also be carried out by the shipper and the master:

– The shipper should provide the master well in advance with the appropriate information on the cargo as per requirements found in Section 4.2.2 of the IMSBC Code.

– This information should be accompanied by a declaration by the shipper (Section 4.2.3).

– The master should check, based on the information provided on the cargo declaration, whether the cargo can be safely carried on board the vessel or whether additional information is required.

– The shipper should provide the master with a signed certificate of the TML, and a signed certificate or declaration of the MC issued by an entity recognized by the Competent Authority of the port of loading (Section 4.3.2).

– The master should check that the laboratory test undertaken ashore to determine the TML of a cargo has been conducted within six months of the date of loading the cargo3 (Section 4.5.1).

– The master should check whether the testing of the MC of the cargo that is being presented is as near as practicable to the time of loading, and not more than seven days (Section 4.5.2).

– If there has been significant rain or snow between the time of testing and loading, check tests (laboratory tests, not can tests) should be conducted to ensure that the moisture content of the cargo is still less than its TML.

It is a master's responsibility to ensure that his/her vessel is safely loaded. If a shipper's declaration has not been provided and has not been forthcoming, then the master should not start loading and immediately notify the vessel's owners.

During loading

Loading should only commence when the shipper has fulfilled the requirements outlined above and the master is satisfied with the information he has been provided with. The master should also complete the ship shore safety checklist as recommended by the Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code4).

The master and owners may consider the appointment of an experienced, independent cargo surveyor in order to check the shore-side stockpile and if necessary, take samples. In most ports, the master may not be allowed to go ashore to inspect the stockpile.

During loading the master should:

– Arrange for the deck to be adequately manned so as to carry out a visual inspection of the cargo being loaded.

– Be aware of the build-up of water pools or splatter on the bulkheads – this indicates excessive moisture.

– Continue to systematically carry out and record 'Can Tests' as described above.

– Restrict the ingress of water and not load during periods of rainfall.

– Make sure that the hatch covers of all non-working holds are kept shut.

– Ensure that, if the cargo is being loaded from barges, the barges are adequately covered during periods of precipitation and water ingress. If this is not the case, the master should not accept any cargo from these barges unless the moisture content has been re-established.

– If the vessel encounters prolonged periods of precipitation during the loading period, request check tests to ensure that the MC of the cargo is still less than its TML.

– Prior to completion of loading, ensure that the cargo is reasonably trimmed (as per dry bulk cargo good practice).

– On completion of loading, ensure that the hatch covers are closed and secured as required.

If during loading the master has reason to suspect that the MC is in excess of the TML, he/she should stop loading the cargo and inform the owners. The master may issue a 'Letter of Protest' and seek further advice from the P&I Club.

During the voyage

Monitor the cargo holds regularly to check for any sign of accumulation of free water in the cargo. Although these inspections may not provide a true representation of the cargo condition, they may provide an indication of how the cargo has behaved since it was loaded. However, this should only be carried out if it is safe to enter the holds, as mineral cargoes tend to deplete oxygen levels.

If it is not already part of the ship's routine, sound the cargo hold bilges on a daily basis. Although free water is expected to drain it can hold the moisture towards the bottom of the hold and develop a wet base.

If necessary, consider ventilation of cargo as and when appropriate. This will depend on the advice contained in the IMSBC Code for that particular cargo loaded. Monitor the vessel's motion, in particular the rolling period. A change in the rolling period may provide a warning of a reduction in the vessel's GM.

If the master or owner has any reason to suspect that the cargo liquefaction is or may be occurring, they should immediately:

– Contact their P&I Club;

– Contact the nearest coastal state authority;

– Consider heading to the nearest port or place of refuge;

– Consider measures to reduce the vessel's vibration/motion.

Key facts about cargo liquefaction

Cargo liquefaction may occur without additional water content (e.g. from rainwater) if the inherent moisture content is already too high, yet undetected by improper checks/tests, agitation alone will cause liquefaction to happen.

– Space between particles reduces

– Air is expelled

– Water pushes particles apart

– Loss of shear strength

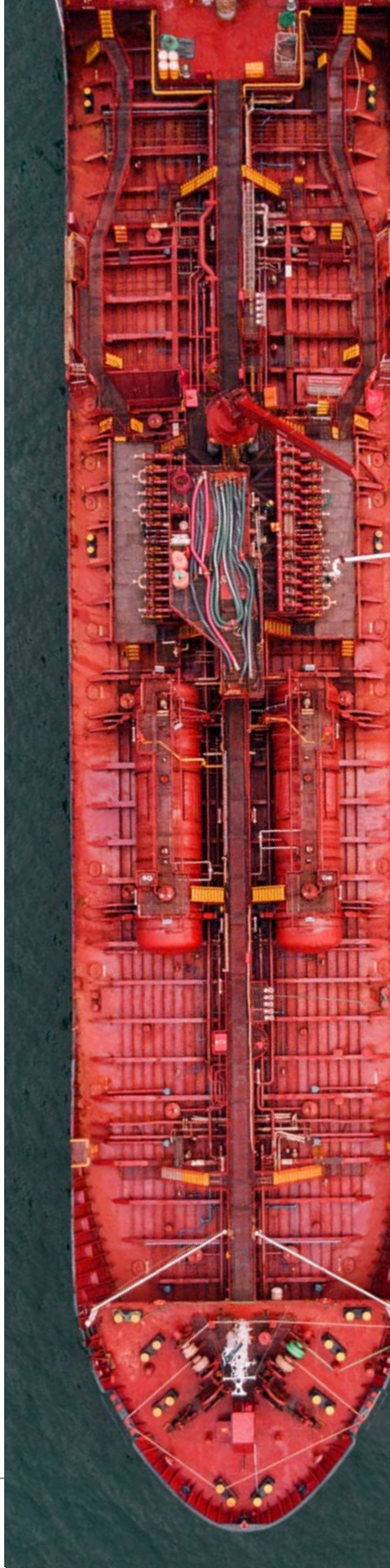
– Solid cargo becomes liquid

– Centre of gravity shifts

– Free surface effect

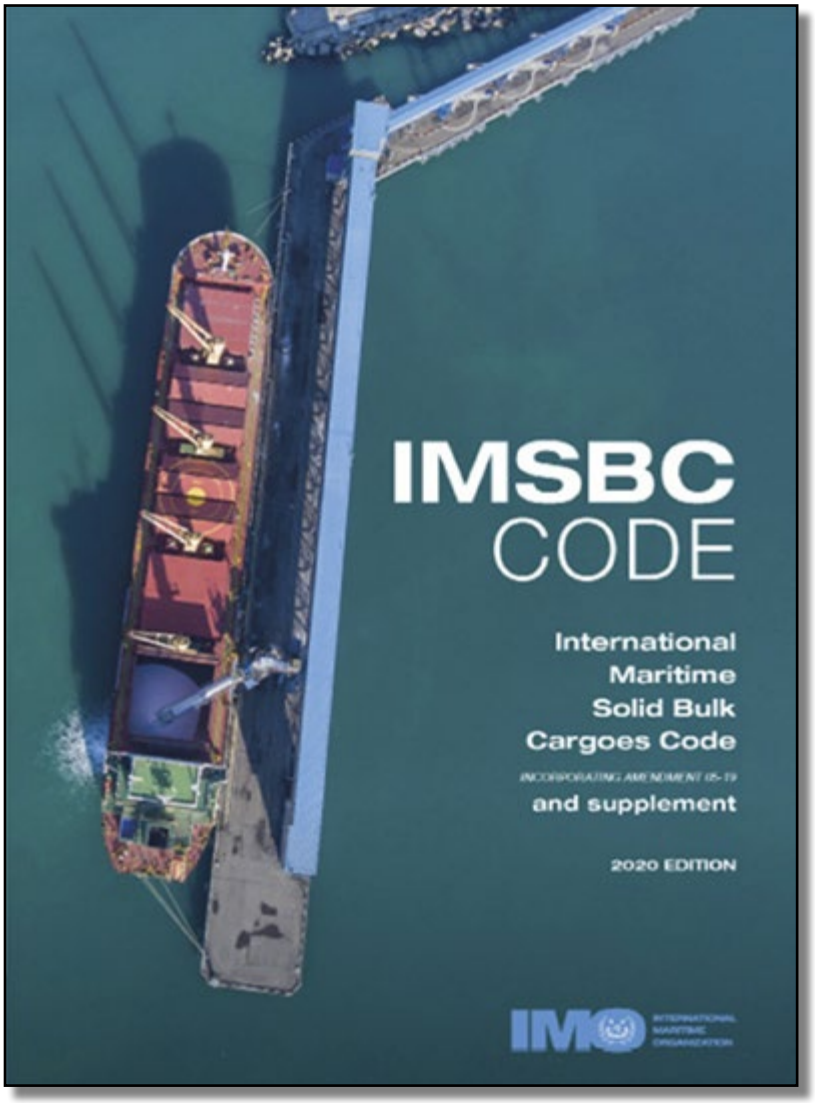
– Ships may capsize

Read the booklet in pdf format at **https://bit.ly/2TfBInP**.



IMSBC CODE AMENDMENTS COME INTO FORCE FROM 1 JANUARY 2021

As Amendment 05-19 of the International Maritime Solid Bulk Cargoes (IMSBC) Code comes into force on 1 January 2021, here are some of the changes outlined in more detail. The IMSBC Code amendments happen every two years to reflect the changes in the nature and variety of solid bulk cargoes presented for shipment. In June 2019, IMO's Maritime Safety Committee adopted Resolution MSC.462 (101) specifying forthcoming IMSBC Code amendments (05-19).



Bauxite cargoes are subject to change with and the new criteria distinguishing a bauxite cargo that may liquefy (Group A) from one that will not (Group C).

The work of the Global Bauxite Working Group culminated in the revision of the Group C bauxite schedule and a new Group A bauxite fines schedule, together with a new testing procedure developed just for bauxite cargoes.

Some notable developments in the new Amendment 05-19 of the IMSBC Code relating to bauxite cargoes are as follows:

- The particle size distribution (PSD) formula is the new criteria that distinguishes a Group A bauxite cargo from a Group C one;
- When PSD can be irrelevant;
- When a Group A bauxite can become a Group C bauxite cargo;
- New testing procedure for bauxite cargoes.

PSD criteria and Group A and C bauxite cargoes

A bauxite cargo will be classified as Group A if it has the following PSD formula:

- more than 30% of fine particles less than 1 mm (D30 < 1 mm); and
- more than 40% of particles less than 2.5 mm (D40 < 2.5 mm).

The Group C bauxite cargo schedule has been revised to include the above PSD criteria.

A bauxite cargo can only be classified as Group C under any of the 4 scenarios:

- It has 30% or less of fine particles less than 1 mm (D30 ≥ 1 mm);
- It has 40% or less of particles less than 2.5 mm (D40 ≥ 2.5 mm);
- It has both of the above;
- Freely draining cargo.

Freely draining cargo – PSD irrelevant

The PSD is irrelevant if the shipper is able to provide the master with a certificate, in accordance with the result of the test approved by the competent authority of the port of loading, stating that the moisture of the cargo freely drains from the cargo so that the degree of saturation is not liable to reach 70%. When such a certificate is produced, the bauxite cargo can be classified as a Group C bauxite cargo.

When a Group A bauxite can become a Group C bauxite cargo

Even if a Group A cargo meets the PSD criteria as set out in the Group A bauxite schedule, it can still be classified as a Group C if the shipper is able to provide the master with the certificate as mentioned above.

New testing Procedure for Bauxite

A new testing procedure developed just for bauxite cargoes can be found in Appendix 2 (Laboratory test procedures, associated apparatus and standards) of the new Amendment 05-19. It is called the modified Proctor/ Fageberg test procedure for bauxite.

This new procedure works as follows:

- The transportable moisture limit (TML) of a cargo is taken as equal to the critical moisture content at 80% degree of saturation where the optimum moisture content (OMC) of the bauxite tested occurs at saturation levels greater than or equal to 90%.
- The TML of a cargo is taken as equal to the critical moisture content at 70% degree of saturation where the OMC of the bauxite occurs at saturation levels less than 90%.
- Where moisture freely drains from the sample such that the test sample compaction curve cannot extend to or beyond 70% saturation, the test is taken to indicate a cargo where water passes easily through the spaces between particles. Therefore, the cargo is not liable to liquefy.

Even though this is a new procedure, section 8 of the IMSBC Code stipulates that it is ultimately the competent authority in the country of origin of the cargo that determines the procedure for testing of moisture content and TML of a cargo. Only in the absence of such test procedures, the Appendix 2 test procedures as appropriate for the cargo in question are recommended.

Additionally there are changes to the Seed cake entries in the IMSBC Code

Regarding the Seed cake, there is no longer a seed cake entry that originally carried a Bulk Cargo Shipping Name (BCSN) "Seed cake (non-hazardous)". This was a Group C entry, namely an entry containing seed cake cargoes that do not liquefy (Group A) nor possess a chemical hazard (Group B). It will be replaced by the following schedule that carries a new BCSN: "Seed cakes and other residues of processed oily vegetables".

This is still a Group C schedule but covering a wider range of products apart from seed cakes. Traditionally seed cakes cover only residual products of oil-bearing seeds manufactured using a solvent extraction or mechanically expelled process.

This new Group C entry covers any residual product that is made from seed, grain, cereal, fruit or vegetables and through any chemical process.

For the cargo in question to be classified as a Group C cargo under this new schedule, the following requirements have to be met:

- It does not meet the dangerous goods criteria under the International Maritime Dangerous Goods (IMDG) Code's classification of dangerous goods (see 9.2.2 of the IMSBC Code);
- It does not meet the criteria for materials hazardous only in bulk (MHB) (see 9.2.3 of the IMSBC Code);
- It is substantially free from flammable solvents or other flammable chemicals.

The way for the above requirements to be met are not specifically mentioned in the schedule but it is expected that some type of official certification will be required similar to what is required for the revised seed cakes UN 1386 and UN 2217 schedules in the form of a certificate recognised by a competent authority at the country of shipment.

In addition, a new Group B, MHB seed cake schedule carrying BCSN "Seed cakes and other residues of processed oily vegetables", has been introduced under this Amendment. This schedule aims to capture all those products that do not meet the criteria for dangerous goods as per IMDG Code classification but yet fulfil the MHB criteria for self-heating (SH) properties.

As for the revised Seed cakes UN 1386 and UN 2217 schedules, the exempted cargoes have been renamed as "excluded" cargoes in the above-mentioned seed cake schedules. The excluded cargoes remain valid under the revised entry. The shipper will need to produce a certificate recognised by the competent authority at the country of shipment stating the oil and moisture content of these excluded seed cakes for them to qualify as such.

For these excluded cargoes to be classified as Group C, the shipper will need to comply with additional certificate requirements as mentioned in the Group C schedule that are applicable to them. Essentially, the shipper will need to produce a certificate, recognised by the competent authority of the country of shipment, stating that the requirements for exclusion from either the schedule for SEED CAKE UN 1386 (b) or UN 2217, whichever is applicable, are met and that the material does not meet the MHB (SH) criteria specified in 9.2.3.3.

Download the report of the maritime safety committee on its 101st session at **https://bit.ly/37qA6ji**.

SHIPPING, SUPERYACHT AND BOATING FACTS, STATISTICS AND TRENDS. HOW WELL DO YOU KNOW YOUR INDUSTRY?

If you celebrate Christmas, here's a simple party game you can play after the festive meal has been consumed. Why not test the knowledge of your loved ones and impress them with your grasp of the marine industry? How well do you know what is going on around you in your industry and what the future trends are predicting? In this article, the latest available facts, statistics and trend analysis are set out for your interest.

GLOOMY ENVIRONMENTAL STATISTICS RELEVANT TO THE OCEAN

- More than 1 million seabirds and 100,000 marine animals die from plastic pollution every year.
- There are now 5.25 trillion macro and micro pieces of plastic in our oceans and 46,000 pieces in every square mile, weighing up to 269,000 tonnes.
- Every day around 8 million pieces of plastic makes their way into our oceans.
- The Great Pacific Garbage Patch is around 1.6 million square kilometers – bigger than Texas.
- 88% of the sea's surface is polluted by plastic waste.
- On UK beaches alone there are 5,000 pieces of plastic and 150 plastic bottles for each mile.
- Over 8 billion plastic straws pollute the world's beaches.
- By the end of 2020 the number of plastics in the sea will be higher than the number of fish.

WHAT DO YOU KNOW ABOUT THE PEOPLE WHO INHABIT COASTAL AREAS AND THE OCEAN ECONOMY?

The ocean is vast, covering 140 million square miles (363 million square km), equivalent to approximately 72 per cent of the earth's surface.

- More than 600 million people live in coastal areas that are less than 10 meters above sea level.
- Nearly 2.4 billion people (about 40 per cent of the world's population) live within 100 km of the coast.
- The ocean economy, which includes employment, ecosystem services provided by the ocean, and cultural services, is estimated at between US$ 3-6 trillion per year.
- Fisheries and aquaculture contribute $US100 billion per year and about 260 million jobs to the global economy.
- Shipping is responsible for more than 90 per cent of the trade between countries. The global oceans based economy is estimated at $US 3 trillion a year, which is around 5 per cent of global GDP.
- Approximately 50 per cent of all international tourists travel to coastal areas. In some developing countries, notably Small Island Development States, tourism accounts for over 25 per cent of GDP.



SHIPPING

The worldwide shipping sector

As maritime is a vast, intricate and global industry, the factors that can affect trade are seen through a very wide lens and cannot be narrowed down to societal or political national influences. Global population, economy, trade and environment are shaping the way ports and vessels will operate in the next thirty years; these are the colours that paint a picture of what the maritime future will look like.

Read on to find the future trends that will affect the maritime industry.

Historically, we have only ever seen an upwards trend in seaborn trade and we will certainly continue to do so. Experts imply that pitting this trend alongside the constant growth of global GDP will see triple the current amount of goods being transported at sea in the coming decades.

We are yet to see a more practical way of delivering large volumes of cargo over long distances than shipping containers on trade vessels. The opportunity to capitalise on marine trade growth by expanding business and improving operational development in ports has never been better.

SUPERYACHT

Trends in the Superyacht sector (including Megayachts and Gigayachts)

Taking into consideration the current state of the worldwide superyacht industry, here some trends that are expected over the next decade.

A superyacht is the ultimate platform for luxury. Superyachts have always been prized for their ability to offer supreme privacy. However, a new trend in secluded areas within the yacht itself is causing a different breed of yacht to take the world of luxury cruising by storm. As superyachts continue to grow in size, so do the possibilities for palatial private spaces, spas, balconies, cinemas, and gymnasiums. With high-tech office, yoga studios, and reading rooms in demand, impressive personal zones will continue to push limits. From snow rooms to private pool decks that transform into sports courts, nothing, it seems, is impossible when it comes to the latest trends in yachting.

Increasingly, individuals want to contrast the experience of five-star luxury with that of adventure. Since yachting provides freedom of the seas, they can decide where to go and when. Within Europe, newer yachting destinations such as the Eastern Mediterranean are becoming increasingly appealing.

BOATING

Some boating stats – let's start with those specific to the US

- In 2019, the Coast Guard counted 4,168 accidents that involved 613 deaths, 2,559 injuries and approximately $55 million dollars of damage to property as a result of recreational boating accidents.
- The fatality rate was 5.2 deaths per 100,000 registered recreational vessels.
- Where cause of death was known, 79% of fatal boating accident victims drowned. Of those drowning victims with reported life jacket usage, 86% were not wearing a life jacket.
- Where length was known, eight out of every ten boaters who drowned were using vessels less than 21 feet.
- Alcohol use is the leading known contributing factor in fatal boating accidents; where the primary cause was known, it was listed as the leading factor in 23% of deaths.
- Where instruction was known, 70% of deaths occurred on boats where the operator did not receive boating safety instruction. Only 20% percent of deaths occurred on vessels where the operator had received a nationally-approved boating safety education certificate.
- There were 171 accidents in which at least one person was struck by a propeller. Collectively, these accidents resulted in 35 deaths and 155 injuries.
- The 11,878,542 recreational vessels registered by the states in 2019 represent a 0.22% increase from previous year when 11,852,969 craft were registered.

SHIPPING

The Africa Effect
Predicted lower child mortality rates and higher life expectancy in Africa will boost the population by hundreds of millions over the coming decades. The African continent plays a very big part in global GDP and that role is set to become even more prominent. The significant population increase will result in a similarly sharp rise in trade to and from Africa, seeing it become a global trading force akin to the US, China and Europe.

In terms of what this currently means for the logistics industry, we can look to China as an example of a fast-developing relative newcomer that has firmly established itself as one of the world's largest logistics suppliers. China only joined the WTO (World Trade Organisation) in 2001, and the countries that invested early are now benefiting from interconnected logistics networks between Europe and China.

Harbouring hope for the environment
With the amount of goods transported around the world set for significant annual growth, the urgency to tackle climate change is likely to increase. The global transition to a cleaner maritime sector will result in the UK's resilience to do all that is necessary to meet the commitments set out in the Paris agreement, including our pledge to produce net zero emission shipping by 2050.

Environmental sustainability in the sector will more likely benefit cash flow in the maritime industry, rather than hindering it. Less money spent on energy and fuel means more money spent on improving productivity by investing in digital practices; these digital solutions will not only improve sustainability, they will revolutionise processes, customer service, multi-site management and all the other key aspects of your business.

SUPERYACHT

Similarly, there is a growing desire for access to even more remote locations, such as the Galapagos, Antarctica, and Asia. As a result, the number of explorer vessels and even yachts with ice-breaking hulls is increasing, as are long range vessels allowing for voyages across greater distance. Finally, the number of ancillary craft is rising to accommodate the storage of additional sporting items, like diving equipment, and to provide extra space for guests.

Today's yachtsman is moving away from traditional structures, those with divided interiors and smaller outdoor spaces. Instead, there is an increased focus on the outdoor areas and creating a direct, intimate experience with the sea. Similarly, lighter and larger open-plan interiors are becoming more popular. This maximizes the space that a yacht's inhabitants can share, and it enables yacht owners to incorporate the alfresco feel into the interior of the yacht.

BOATING

Let's take a look at Australia specifically

- Australians are a coastal people, known worldwide for their leisure and lifestyle, leading what is widely termed a "Mediterranean" lifestyle with alfresco-designed homes and cuisine, and culture influenced by their attachment to the sea.
- An interesting fact is that 10 percent of overnight accommodation stays are booked by people on a boating adventure.
- There are approximately one million boats registered in Australia and 30,000 new boats are registered every year.
- One in five Australians claim to be boaties, with one in 23 having personal access to a boat.
- There are 25 percent of the Australian population (5.8 million) who claim to go boating and in the state of Queensland, 34 percent of the population go boating.
- The marine industry in Australia is estimated to be worth AUS$8 billion, with an export portion of around AUS$1 billion.
- More than 3,500 marine businesses are involved that employ 28,000 people.
- The Gold Coast is the key national centre for manufacturing of marine crafts. The city's boat building industry is estimated at AUS$330 million and directly involving more than 450 marine companies.

A Sea of competition
Competition in the maritime sector can only and will increase; large financial investment in the Asia Pacific market is adding more and more logistics companies, specifically warehouses and ports, to an already saturated industry.

The constant improvements of supply chain technology will also fuel competition by improving the processes of ports that invest in logistics software. With more companies operating at high levels of efficiency, the reach, expansion and competitiveness of smaller businesses is set to increase.

Lastly, the rise in demand to match global population increases and the popularity of e-commerce will add to the workload of ports and container movements; several smaller businesses will no doubt emerge in a bid to capitalise on an industry that is constantly progressing.

Digitisation
Automation within the logistics industry will render paper-based operations obsolete in the coming period. All forms of multi-modal delivery chains will be more efficient and cost effective in the long term, thanks to the constant evolution and popularity of Supply Chain Management systems.

The global maritime sector will be able to rely on digital documentation, making shipping transactions more seamless by removing convoluted processes such as training and certification, international operations, quality control, container management, remote surveying and port warehouses.

Toys, such as jet skis, water skis, and canoes, are becoming a primary rather than a secondary part of the voyage. Support vessels often carry additional toys, as well as tenders to cater for this need. In addition, cinema rooms are becoming increasingly popular, and content is expected to be of the highest quality with regard to picture, sound, and speed. Online film libraries and the latest movies now can be bought directly from the studios and are becoming the norm. Because of this, effective internet connections are essential to the yachting experience.

New build sector
The 40 metre plus new build market has exhibited very stable and consistent characteristics over the last five years and output levels are predicted to deliver steady growth of 3.2% CAGR through to 2024, equivalent to an average of 75 new deliveries per year into the marketplace.

It appears that the 70 and 90 metre plus industry niches are growing faster in percentage terms than the smaller LOA segments. This has an exponential effect on the size of the addressable market in terms of the square meterage (m2) and consequently value (€). The estimated market value of the new build paint market alone was €140m and this is forecast to increase to an estimated €175m by 2022.

Worldwide recreational boating trends looking forward to 2026

- The Recreational Boating Market size exceeded USD 43 billion in 2019 and is poised to grow at a compound annual growth rate (CAGR) of over 5% up to 2026.
- At this time it is almost impossible to factor in either a negative or positive effect of COVID-19 on anticipated market values.
- Rising disposable income across North America and Europe is enabling consumers to increase expenditure on marine leisure activities, thereby fuelling the market growth.
- Increasing economic conditions and rising popularity of coastal and marine tourism across the globe will drive the market revenue.
- Increasing participation of consumers in recreational boating activities and water-based sporting events is further driving the market size.
- Increasing fishing activities coupled with rising investment in the rental boat sector are supporting the market demand.
- Increasing government initiatives across Asia Pacific are creating opportunities for the recreational boating market. The government authorities' spending on development of boating infrastructure is a major factor supporting market growth in the region.
- Public and private sectors in countries including Japan, Thailand, China, and Australia are focusing on creating awareness among population to support the market growth.
- The outboard recreational boating market in the US accounted for around 60% revenue share in 2019 due to technological advancements, light weight, fuel economy, and more interior space. These boats

SHIPPING

With a lot being made of the direct impact of logistics software on the shipping industry, it is worth knowing that the sooner you look into and invest in solutions, the sooner you will see an upturn in operational efficiency, business reach and staff/customer satisfaction.

Extracts from the Lloyds Register 2030 Global Marine Trends Report

The marine world in 2030 will be almost unrecognizable owing to the rise of emerging countries, new consumer classes and resource demand. The central question is what it will be like? Will it be a world with multiple players or will one dominate? Will it be a world full of conflicts or in harmony? In qualitative terms, the shape of the marine world in 2030 will depend on tri-polar interactions between people, economies and natural resources. Our future will depend on their relative pulls towards a certain destination.

In the first world of 2030, where people's primary interest is biased towards social development (especially living standards and jobs), we envisage business as usual with occasional disruptions along the way. Government will strive to satisfy people's needs with short term fixes.

SUPERYACHT

Whilst Italy is by far the largest producer of superyachts by unitary volume (39% in 2019), the Dutch and German shipyards both hold significant market shares when measured by value with 31% and 14% respectively.

The overall market growth of the superyacht fleet correlates to the global increase in the number of billionaires which has risen from 1,011 in 2010 to 2,153 in 2019 and is forecast to reach 2,584 by 2024.

The refit sector

The refit market is driven by the life cycle of the paint system which is typically 4-6 years depending on the usage and cruising patterns of each yacht. The timing of the re-painting is flexible, although superyachts must undergo regular maintenance cycles every 5 years to comply with their registry and insurance. Owners typically take the opportunity to undertake repainting work whilst the yacht is out of service for its refit survey, consequently major paintwork tends to follow a 5-year cycle.

The refit market is underpinned by approximately 20% of the active fleet typically due for paintwork each year and continues to grow in line with the increasing size of the global superyacht fleet.

BOATING

are equipped with advanced technologies, such as joystick docking control, automatic trim controls, and digital throttle controls, strengthening the market demand.

- Introduction of outboard boats equipped with powerful propulsion systems is increasing the demand for multiple large outboard engines in the market.
- The US market for above 1,000 hp outboard engines will register around 2% gains through to 2026.
- Growing adoption of fuel-efficient diesel-powered recreational boats means increasing innovation in diesel-based recreational boating system is providing a positive outlook for the market. Moreover, the introduction of powerful and efficient diesel-based engines is supporting the adoption of recreational boats.
- The integration of rail fuel delivery systems, turbochargers, and exhausts with diesel-based engines is creating new industry trends. Furthermore, rising demand for fuel-efficient and quiet operating engines is strengthening the market revenue.
- In 2019, Europe was one of the major regions in the recreational boating market and is expected to witness 5.5% growth up to 2026.
- Government authorities are supporting water recreational activities across the European region and public authorities are launching projects to spread awareness related to water sports activities.
- Companies are adopting various strategies such as technological development, mergers and acquisitions, collaborations, sales channel expansion, and product innovation for business expansion.

We expect the world will continue its current growth momentum with some booms and busts. We call this the "Status Quo" scenario. In another world, where primary interests shift to concern over resource limitation and environmental degradation, we will see a desire for a more sustainable world being developed, and fairness in wealth distribution. Government will act to forge agreement for common goods. We call this the "Global Commons" scenario.

In a further world, where the voice of the people is not heard (or not expressed), the state will mainly act in its own national interest. There will be little effort to forge agreement amongst governments for sustainable development and international norms. This is a zero sum world and we call this future a "Competing Nations" scenario.

World trade relies on ships and the cargoes they carry, and the service industries that support them, as well as the security provided by navies. Without ships and navigable seas there is no globalisation. Shipping, as the enabler of trade, will be shaped by the major economic and social forces described in the report.

By developing and modelling a future based on the scenarios chosen in this significant piece of work, the GMT 2030 team hopes to provide all who are interested in the future of maritime trade with some useful insights into where our world might be going - and how the marine industries will be affected.

The value of refit paintwork is estimated to grow faster than the number of projects, due to the increasing size of superyachts within the global fleet. Market estimates suggest that the current annual value of the refit paint market is c.€233m and will grow to an estimated c.€285m by 2024 (CAGR 3.4%).

Superyacht sustainability

'Environmentally friendly', 'lowering emissions', 'saving our seas' – these kinds of phrases will become even more frequently used within the yachting industry as we progress through the next ten years as moves are underway to improve sustainability.

In recent years, sustainability has become a crucial consideration and necessity rather than a trend. The concern surrounds many business sectors, and individuals, and as people have become more aware of the importance of sustainability, the need for sustainability has really started to take off.

Due to the limited number of resources worldwide, it's essential that yacht designers step-up the search for new and sustainable materials that can be used to build superyachts.

- Manufacturers are incorporating joystick piloting for enhanced manoeuvrability, aiding better recreational boating operations.
- Many companies are involved in development of advanced boats equipped with safety features and enhanced engine capacities.
- Manufacturers are also investing in R&D activities for the development of sustainable recreational boating like never before.

Source: Global Marketing Insights

General thoughts on the impact of COVID-19 on boating

As we swing into and out of the COVID-19 pandemic shutdown, societal easing has started nudging certain sectors of the economy (and that includes boating) in a very positive way. If the positive trend is a lasting one is hard to predict yet. Areas across the United States have opened as positive coronavirus cases slowly decrease. Boat sales are reported to be 60% up on the previous year. The same is true in the UK and Europe, although at the time of writing, a second spike is looking likely as cases soar.

So, it is not surprisingly that boating has emerged as a safe form of outdoor recreation and an ideal social distancing activity for many families.

After months of being cooped up, people are looking for ways to stay in their family unit while engaging in more exciting adventures. Boat dealers, brokers and manufacturers have seen brisk boat sales follow as a result.

Sales of small boats have boomed across the world and many brokers are

SHIPPING

"As the world faces more uncertainty and the potential for highly disruptive change, perhaps, more than at any time in most memories, the report shows that there are justifiable grounds for optimism about the future of our maritime activities.

Maritime trade will be needed more than ever if we are to prosper. This valuable report provides useful insight into the future of shipping and naval power."

Tom Boardley was Marine Director Lloyd's Register Group Limited at the time he made this quote.

The ocean is the highway for international trade, with 90% being seaborne. The global fleet of ships (selfpropelled merchant vessels above 99 gross tonnes) consist principally of bulk carriers, tankers and container ships, which are the vital arteries of international commerce, and thus key to understanding global marine trends. Bulk carriers carry raw materials such as iron ore; tankers carry crude oil and liquefied natural gas and container ships move manufactured goods from manufacturing centres to consuming countries.

SUPERYACHT

The concern for marine life and ocean protection has also soared, encouraging various new strategies to produce plastic-free charters, established by designers and engineers with improved technologies, with the aim of reducing the environmental impact of luxury superyachts.

The look and feel of the vessels are becoming ever important, so enter black interiors and contemporary lighting.

Yacht interiors are expected to follow in the footsteps of home interiors, jumping on the black-finish-bandwagon. The sleek, minimalistic, black craze erupted in the 2010s, often being paired with white décor, and sometimes a splash of colour. It will give yacht interiors a modern look, while maintaining the all-important luxury factor.

Lighting has become much more than simply illuminating a room. It can now be used to alter atmosphere, entertain or turn an uninteresting home essential into a modern piece of art. Within the 2020s, we see the standard room light as being a thing of the past, with more innovative, whacky light

BOATING

reporting low stock levels. In March, things looked bleak in the extreme as marinas and facilities closed. Boat dealer inventories were stagnant, boating businesses locked down as the population became distracted and immersed by COVID-19. Boat sales were nearly non-existent and viewings almost impossible to arrange. But that was soon to change.

Bryan Seti, General Manager for sales and marketing at Yamaha's Watercraft Group, headquartered in Georgia, commented that Yamaha saw record sales in April (up 154 percent over 2019), primarily of boats 19 to 27 feet. Even the colder weather in some northeastern states didn't slow the momentum and people were less picky about available colours.

Matt Gruhn, President of the Marine Retailers Association of America (MRAA), says the sales funnel has been full of leads as people have had time to sit at home and research boats online. Now it's a matter of serious sales efforts and strong inventory levels turning prospects into buyers. The product mix may have also changed a bit with smaller, entry level new boats selling well.

Boating is social distancing at its finest. Families endured months of lockdown with Zoom calls and 1,000-piece jigsaw puzzles. Social distancing will still be important going forward for the long term seemingly, and you can hardly be safer than on a boat with your family unit.

Key threats are climate change and pollution, while opportunities lie in new trade routes and resource exploitation as ice in the Arctic region melts.

Container trade
In 2030, China will still enjoy her leading role in primary container trades. Latin America will bear the highest uncertainties across three scenarios, overtaking Europe and become second in 2030.

The largest container transhipment loaded lifts will still take place in Southeast Asia in 2030. Europe, the current second largest transhipment destination around the world, will face a much slower growth. Her position will be subsequently rivalled by China and the Middle East's remarkable progress by 2030 across all scenarios.

The Global Marine Trends Report is free to download from ***https://bit.ly/3bLMI4L***

designs coming into fashion. Similar to other superyacht features, different styles are becoming vogue.

While superyachts aren't particularly renowned for their speed, the pace of these vessels is pretty impressive. Similar to yacht size, we predict that throughout the next decade we will see the delivery of a yacht with the capability to reach even higher speeds.

So, let's end with some superyacht fastest speed fun facts...
Foners, 41.5 metres (136 feet), built by Izar, can reach a top speed of 70.1 knots

World is not Enough, 42.4 metres (139 feet), built by Millenium Super Yachts, can reach a top speed of 67 knots

Galeocerdo, 36 metres (118 feet), built by Rodriquez, can reach a top speed of 65 knots

Gentry Eagle, 34.1 metres (119 feet), built by Vosper Thornycroft, can reach a top speed of 64 knots

Kereon, 27 metres (89 feet), built by AB Yachts, can reach a top speed of 62.3 knots

Outside is safer experts are suggesting and there are lower transmission rates in the great outdoors. So, rather than sitting in a cinema where the climate control could be spreading the virus, getting some fresh air and vitamin D from the sun both seem beneficial.

There are fewer (if any) opportunities for large gatherings or attending live events. Activities competing for leisure time have always included large gatherings such as concerts, professional sporting events, and amusement parks. As fewer of these activities are open or have restricted capacities, so boating comes into sharper focus.

Families have been looking for vacation opportunities and activities that keep them closer to home. The obligatory summer vacation plans will have often included a bucket trip to Italy, a cruise on a ship, or fish and chips in Benidorm perhaps. International travel is, for most, off the list for months to come.

And the cost of borrowing is low with miniscule interest rates. One can hardly ask for a better lending climate. Most lenders can process loans online so there's zero or limited contact.

STAINLESS STEEL

is best placed to handle the aggressive corrosion conditions found in marine scrubber units

By **Björn Helmersson**

A corrosion specialist with Outokumpu, Björn Helmersson explains why stainless steels are the ideal choice for the aggressive corrosion conditions found in marine scrubber units.

In 2020, the International Maritime Organisation (IMO) introduced new standards intended to reduce sulphur emissions that cause acid rain and air pollution. Their main impact is that the sulphur content in the fuel oil used by merchant vessels is limited to 0.5% globally and 0.1 % in designated Emission Control Areas (ECAs) – the Baltic Sea area, the North Sea area, the United States, Canada, and the United States Caribbean Sea area. Currently, vessel operators have two main options. They can switch to very low sulphur fuel oil (VLSFO) that contains less than the 0.5 % sulphur limit, but which is more expensive. Or they can install a scrubber that washes the vessel's exhaust gases so that it can continue to run on high-sulphur fuel (HFO).

SCRUBBER DESIGNS

Generally, the shipping industry uses wet scrubbers (see Figure 1). These exhaust gas cleaning (EGC) systems wash the exhaust gas stream by forcing it into contact with water to remove the sulphur dioxide (SO_2), a toxic gas that is directly harmful to human health.

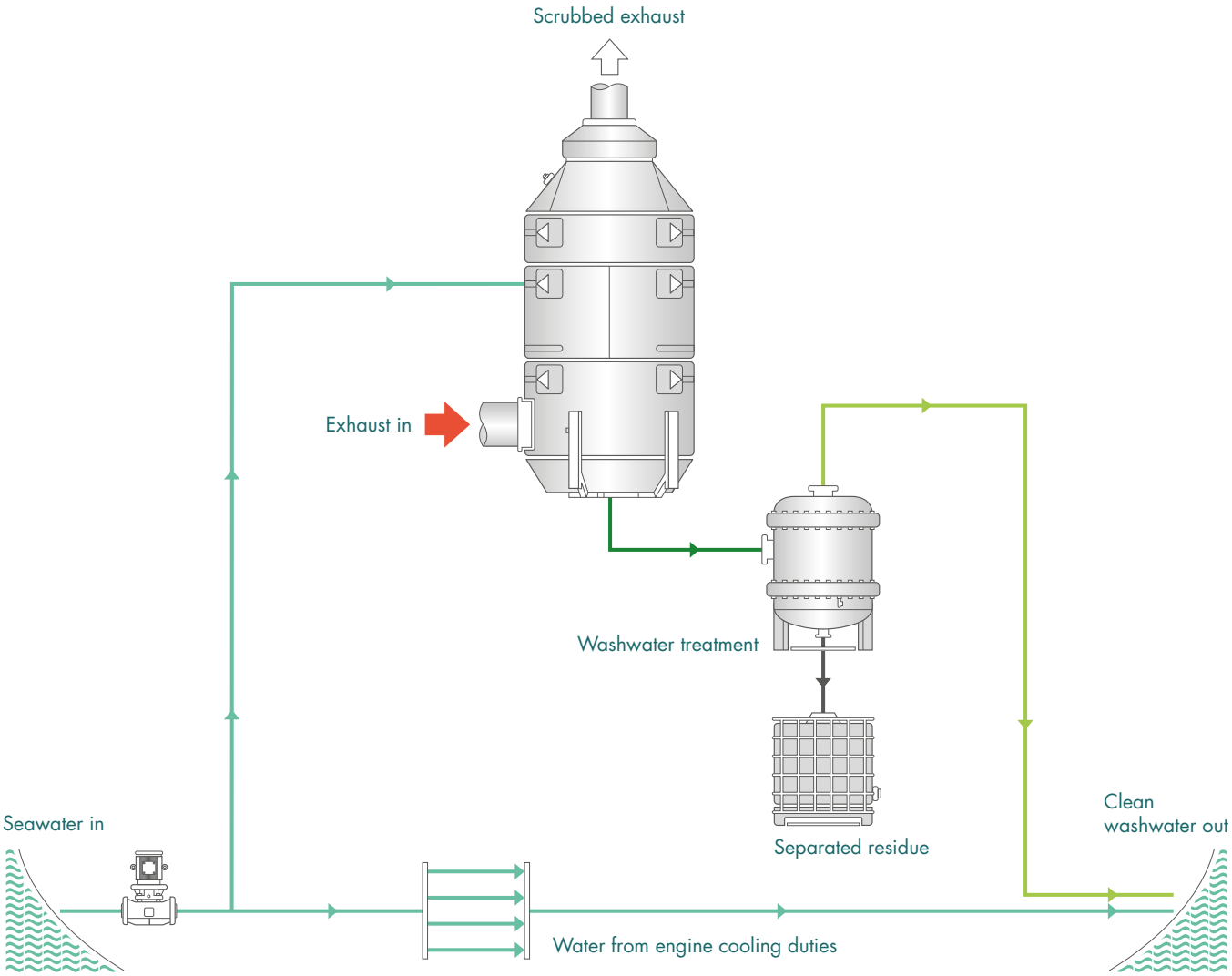


Figure 1: Open-Loop EGC system (credit: Exhaust Gas Cleaning Association)

There are three main design arrangements for marine EGCs:

- **Open-loop:** This uses seawater to scrub the exhaust gas to remove SO2. The wash water is treated and discharged back to sea.
- **Closed-loop:** Fresh water is used in a closed circuit that is treated with an alkaline chemical such as caustic soda.
- **Hybrid:** This can be used in either open or closed-loop mode according to operational needs.

MATERIAL SELECTION IS CRITICAL FOR RELIABILITY

The conditions inside a scrubber are very harsh, with a combination of acids, elevated temperatures and a high chloride content in the wash water. To ensure the desired 20-year service life, high-alloyed stainless steels and nickel base alloys are required. It can be devastating to select a material with insufficient corrosion resistance. Yet the safest choice is seldom the most economic one.

CORROSION TYPES AND SERVICE CONDITIONS

There are three main types of corrosion risk found in marine scrubbers:

Pitting corrosion

- Caused by a critical combination of chlorides, high temperatures and low pH
- Stainless steel is protected against corrosion by a natural, self-forming passive oxide film on its surface. If a local breakdown of this protective film occurs it causes the formation of pits

Crevice corrosion

- Caused by the critical combination of chlorides, high temperatures and low pH and the presence of crevices

Uniform corrosion

- Typically occurs in very acidic conditions
- Uniform corrosion rate across the surface

At the inlet, where the uncleaned gas meets the wash water, there is a mix of wet and dry conditions, with condensing acids from gas and chloride-rich wash water and elevated temperatures. These conditions are very aggressive with a risk of uniform and pitting corrosion.

Within the scrubber body there is a slightly acidic wash water combined with a lower temperature than the inlet. The main risk here is pitting corrosion. Similar conditions apply for other parts of the scrubber system, such as packing material, demisters, tubing and spray nozzles

Crevice corrosion may occur in areas where two surfaces are in close contact, such as flanges, packing material and under deposits.

THE INFLUENCE OF SCRUBBER TYPE ON MATERIAL SELECTION

In the open-loop design, the presence of chlorides typically requires the use of high-alloyed materials. In the closed-loop design, where water is recirculated and treated with caustic chemicals, the corrosivity depends on the quality of the wash water. Typically, the conditions are less aggressive than in the open-loop design.

Since the hybrid design alternates between open- and closed-loop operation, materials must be selected according to the most aggressive operating conditions. Therefore, the same materials are used as in an open-loop scrubber.

OPERATIONAL EXPERIENCE AND FIELD TESTING ARE VITAL

Outokumpu has been supplying stainless steel for marine EGCs since 2006. It carries out extensive R&D activities including laboratory testing and long-term field testing in cooperation with marine scrubber OEMs and their customers. The results show that material selection must always be done on a case by case basis.

For the scrubber body, Ultra 254 SMO is one of the most widely used grades. This is a 6% molybdenum and nitrogen-alloyed austenitic stainless steel with extremely high resistance to both uniform and localized corrosion. It was developed initially for oil and gas offshore platforms and the pulp and paper industry.

However, in some cases it is possible to use a 25Cr super duplex stainless steel such as Forta SDX 2507. This offers similar corrosion resistance to Ultra 254 SMO and improved mechanical strength. It is well proven in extremely corrosive environments such as desalination, chemical, or offshore subsea applications.

Standard 22Cr duplex stainless steel can also be used successfully in less aggressive applications such as closed-loop designs and some parts of open-loop scrubbers. A typical example is Forta DX 2205, which is the most popular duplex product on the market. It offers very good resistance to uniform and localized corrosion in combination with high mechanical strength.

ULTRA 654 SMO – AN ALTERNATIVE FOR SCRUBBER INLETS

As the entry point for hot exhaust gas, the scrubber inlet is a particularly demanding application. Traditionally, Alloy 31 has been the material of choice. It is an iron-nickel-chromium-molybdenum alloy with nitrogen addition developed to fill the gap between special alloyed austenitic stainless steels and nickel alloys.

The test program has established that Ultra 654 SMO offers a viable and more cost-effective alternative. This is a 7% molybdenum and very high nitrogen-alloyed austenitic grade that is the most corrosion resistant stainless steel in the world.

Ultra 654 SMO has a higher mechanical strength than Alloy 31. If the design of the inlet enables this higher strength to be utilized then it could offer weight savings between 15 to 25%. Furthermore, the lower nickel content of Ultra 654 SMO also makes it cost-effective and more stable in price.

PRACTICAL EXAMPLES

Outokumpu currently supplies stainless steel material for use in the construction of around 60% of the marine scrubbers installed every year. Two typical examples include:

Ecospray Technologies S.r.l. Italy (Figure 2) needed a highly corrosion resistant material for its exhaust gas cleaning scrubbers. Ultra 254 SMO proved to be the best combination of performance, price and dimensions.

Figure 2: Ecospray Technologies scrubber in Ultra 254 SMO.

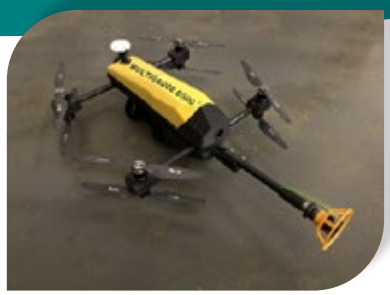
ContiOcean Environment Tech Co., Ltd. delivers open-loop scrubbers to cargo ships of various size classes. Forta SDX 2507 provides the necessary corrosion resistance for the harsh conditions in the scrubber body (see Figure 3).

SUMMARY AND– KEY FACTS ABOUT MATERIALS FOR MARINE SCRUBBERS

- Material selection is the most critical factor in helping ship owners to ensure the reliability of their exhaust gas cleaning (EGC) systems over a 20-year service life
- A wide range of stainless steels can be used
- Conditions and corrosivity vary depending on location and type of scrubber
- Materials selection should always be made according to the specific operating conditions
- Duplex grades can often replace the dominating austenitic choices
- For the toughest situation found in the scrubber inlet Ultra 654 SMO offers a very competitive alternative to Alloy 31

Figure 3: Open-loop marine scrubber manufactured by ContiOcean Environment Tech Co., Ltd in super duplex stainless steel

Tritex NDT Multiple Echo Ultrasonic Thickness Gauges



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Multigauge 6000

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NEW PRODUCTS

Each quarter The Report brings you an update on some of the new products and innovations to hit the boating, shipping and maritime industry.

Integrated boat and marina solution designed to monitor boats in real time

The Falco smart marina solution, to be launched in the UK in early 2021, comprises three main components – an app for boaters to access marine information, a device which tracks essential alerts such as a slipped mooring line, smoke detector, list or leak, intrusion or impact together with information about temperature and humidity levels and a network of WiFi sensors based on shore to track boat movements in real time.

The system has been developed and perfected by researchers in Inria France and will 'empower marinas to develop the best-connected customer experience', said Elsa Nicol, chief executive at Wattson Elements and founder of the Falco system.

"The marina office operates this service and responds in real time, providing customers with peace of mind, added security and protection of their treasured investments," said Elsa.expect the S30-OB to play a significant role as a cash cow in the company."

New wireless load sensor by Cyclops Marine

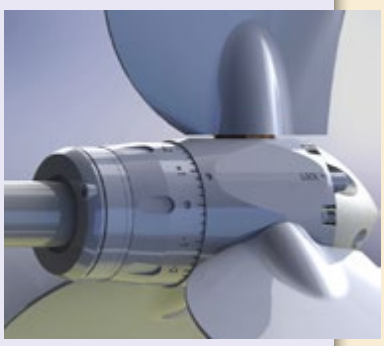
Cyclops Marine has launched a new wireless load sensor designed to help sailors find their groove, record their settings and most importantly repeat those settings.

The sensor, called smartlink, delivers onboard, real-time dynamic load measuring, wirelessly feeding the data to a mobile application or the boat's instruments via NMEA2000 Gateway and cable.

Manufactured in low density titanium, smartlink is lightweight and simple to add inline to any soft stay or sheet. Once fitted, the smartlink will help sailors find their winning settings and be able to repeat those proven settings for the wind conditions and the sea state.

"At any point in time, sailors can see what loads they are working with," said Ian Howarth, chief executive at Cyclops Marine. "Teams are feeding back they are trimming their boats better, more consistently and sailing faster. Real time loading with visible numbers makes this easy."

Smallest propeller from Ewol



Ewol Propellers is launching its smallest propeller to date, the E3 Andromeda. Said to be small but powerful, it has a slim and streamlined body, and is suitable for boats from 6-10 meters and engines from 7-30 hp.

A feathering propeller, the E3 Andromeda is made using high-resistance stainless steel. Like the larger E3 Orion and E4 Pegasus, its core is made up of gears that allow the blades to navigate according to the fluid threads of the water while sailing and provide the correct angle of incidence during engine navigation, said to improve both performances under sail and under engine.

The orientation of the blades is fully automatic. The micrometric setting of the pitch is performed from the outside using the adjustment ring allowing the thrust to be optimised, providing higher cruising speeds with lower revs which increases fuel efficiency.

Yanmar introduces saildrive to larger monohulls and multihulls

Yanmar says it has answered significant demand from the world's leading boat builders with the introduction of the SD15 saildrive solution for larger sailboats with engines from 80 HP to 150 HP.

Enabling the 50-to-65-foot monohull and multihull sector to access the installation and user benefits associated with saildrive systems for the first time, the new SD15 is already successfully installed on a Sunreef 50 following extensive field testing on a Kufner 54.

The SD15 saildrive, made by ZF, can be coupled to the Yanmar 4JH80, 4JH110 and 4LV150 common rail engines, offering a new option to a vastly extended range of sailboats and catamarans using higher horsepower engines that have previously relied on conventional drive lines.

Icom reintroduces two fixed marine VHF radios due to customer demand

The IC-M423GE (formerly the IC-M423G) and the IC-M400BBE (formerly the IC-M400BB) are almost identical to their predecessors except that they now feature an integrated GPS and an external GPS antenna to meet the latest ITU-R M493-14 regulations.

The reintroduction of the models also means that Icom's HM-195CMI Multi-Station Commandmic Interface is back, allowing users the option of controlling the IC-M423GE and IC-M400BBE with a pair of remote Commandmics.

The IC-M423GE VHF/DSC marine radio is suitable for customers who are looking for a compact radio for their boat with advanced functions and dual station control, explained Ian Lockyer, Icom marketing manager.

Intellian releases new antenna for smaller vessels

Intellian's new GX60NX antenna is type approved for use with Inmarsat's Global Xpress Ka-band VSAT network and was launched earlier this year. The compact and lightweight GX60NX 65cm terminal is the smallest in Intellian's GX portfolio range and brings the functionality and performance of the NX Series to smaller vessels using Inmarsat's Fleet Xpress service for reliable, fast connectivity at sea.

"We're delighted to introduce the GX60NX antenna, completing our GX NX portfolio and bringing the benefits of our future-proof, user-friendly antennas to our valued customers in the small commercial, leisure and fishing markets," said Eric Sung, Intellian CEO. "The integration of our market-leading technology with Inmarsat's global network provides a seamless route to connectivity, whatever the needs of your business."

The Below Deck Terminal (BDT), single cable antenna connection and AptusNX control software are identical to those used for the larger GX100NX, which is already approved. This allows ship management companies and ship owners to benefit from the ability to work with a standard platform across diverse fleets.

NEW PRODUCTS

Flexiteek has received a new EU patent for its 2G synthetic teak

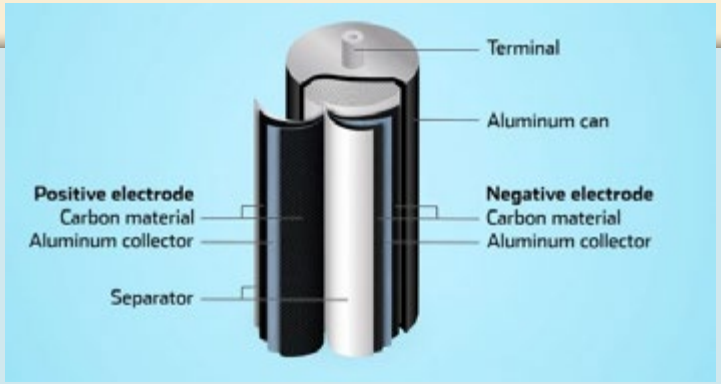
The grant of patent EP3071473A1 covers the material composition and 2G technology used for the product and joins existing patents for material composition in both the USA (US9676925B2) and Sweden (SE538714C2).

"Throughout 2020 we are celebrating 20 years of innovation and are therefore delighted at the timing of the EU patent," said Tomas Gustafsson, Flexiteek International CEO. "There is a misconception that all synthetic teak is heavy and hot underfoot, this simply isn't true with Flexiteek 2G synthetic teak."

The teak has been developed to cool 30% faster than traditional composite decking and have a 35% weight saving compared to other composite decking systems.

It is manufactured using a REACH compliant phthalate-free plasticiser and is fully recyclable.

Flexiteek works with more than 100 major boat builders and OEM clients worldwide, including Hanse Group, Cantiere del Pardo and Sunseeker International.



Skeleton Technologies explores graphene battery with a 15-second charging time technology

Skeleton Technologies, a specialist in graphene-based ultra-capacitor energy storage, has partnered with the Karlsruhe Institute of Technology. The partnership aims to complete the development of the SuperBattery, a groundbreaking graphene battery with a 15-second charging time.

This extra fast charging time coupled with charging cycles counted in hundreds of thousands make the SuperBattery a perfect solution for the three main issues affecting marine electric propulsion, slow charging times, battery degradation, and range anxiety. According to Skeleton their patented Curved Graphene carbon material, enables the high power and long lifetime of ultra-capacitors to be applied in a graphene battery.

Skeleton Technologies' CEO Taavi Madiberk commented, "Cooperation between European energy storage companies is key for the EU to be a global leader in energy storage. We are delighted to have signed the SuperBattery development deal with Karlsruhe Institute of Technology and combine forces to bring to market a technology that will blow existing EV charging solutions out of the water. Together with Li-ion batteries, they have it all: high energy and power density, long lifetime, and 15-second charging time".

Scanstrut announces new waterproof wireless products

Scanstrut has announced two new additions to its waterproof wireless charge range. The IPX6 waterproof range enables charging in the outdoor environment, without the need for phone charging cables. Scanstrut says this is the world's first waterproof wireless charge system created specifically for use on board.

Now available is the Nest, a 12/24V waterproof wireless charging pocket which can be integrated into consoles, seating, cabinetry and more. Phones are slid into the pocket and instantly start wirelessly charging.

Suzuki develops the world's first micro-plastic collecting device for outboard motors

Suzuki Motor Corporation has developed what's said to be the world's first Micro-Plastic Collecting Device for installation on outboard motors. To help tackle the issue of micro plastics in the ocean's ecosystem, Suzuki has focused on the structure of the outboard motor, which pumps up tons of seawater to cool the engine and then returns it to the ocean. Suzuki has developed a device which collects micro-plastic waste from the returning water, meaning that micro-plastic waste can be extracted from the seawater just by running the engine.

Easy to install to the return hose, it does not affect the engine performance as it only utilises the returning water that has been used to cool the engine.

Mark Beeley, Head of Marine & ATV for Suzuki GB, says: "This marks the first time in marine industry history that an outboard motor cooling system has been utilised to extract micro-plastics from the seawater. We are really excited by this announcement and I must commend the factory on this ground-breaking development which is part of Suzuki's continuing determination to devise innovative solutions that mitigate the serious impact of plastic waste on our natural environment."

Smallest stabiliser yet from Seakeeper

Seakeeper has launched its smallest and most radically different gyro stabiliser. The Seakeeper 1 is designed to eliminate up to 95% of boat roll on vessels of 7m to 9m or up to approximately 5.5 tonnes.

Weighing 165kg and with a height of 40cm, the Seakeeper 1 is completely contained with no part of the sphere hanging below the point of installation. The Seakeeper 1 relies solely on 12V DC power, consuming just 55 Amps. It begins stabilising within 15 minutes and can be controlled directly from the unit or from the helm.

Marlow Ropes launches Blue Ocean Doublebraid

Blue Ocean Doublebraid is Marlow Ropes' latest addition to its eco-conscious range, manufactured from sustainable materials. The heat-set, braid-on-braid Doublebraid is made from 100% recycled waste plastic bottles and is said to provide industry-leading strength and stretch performance.

"It is important to us at Marlow that we take responsibility to become more sustainable and provide our customers with more rope options. We have worked hard over the last couple of years to eliminate plastics from our ranges, lower our carbon footprint and introduce sustainable materials. With half of our range now made using these sustainable materials we are getting closer to achieving our target of using 100% reliance on recycled materials by 2030," says leisure marine director, Paul Honess.

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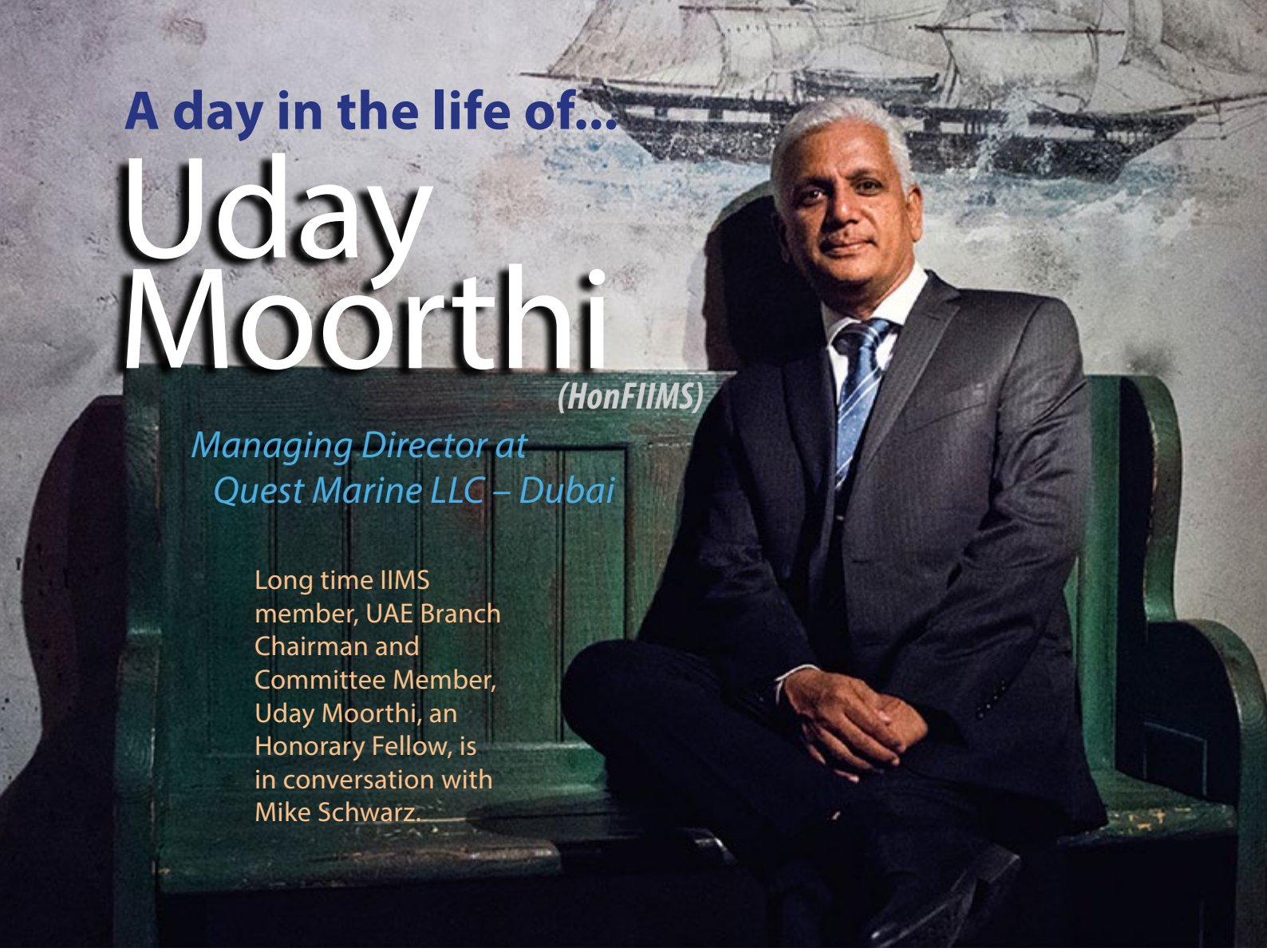
A day in the life of...

Uday Moorthi

(HonFIIMS)

Managing Director at Quest Marine LLC – Dubai



Long time IIMS member, UAE Branch Chairman and Committee Member, Uday Moorthi, an Honorary Fellow, is in conversation with Mike Schwarz.

Q1. What was the appeal of the marine surveying profession and was it a deliberate decision to enter the sector?

There are nostalgic memories linked to this turn of events in my life. I vividly recollect an episode way back in the late seventies when I was on the verge of completing my secondary schooling. There was a celebrated (Naval Officer) uncle of mine, who had advised my father to urge me to recruit myself into the Indian Navy.

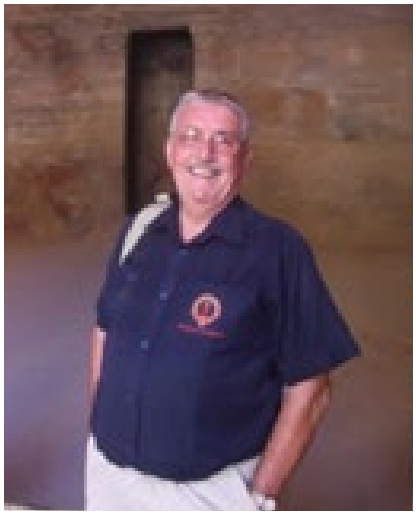
His vision board for me was very clear. He had prophesied that I had the right aptitude and if I stayed focused, I could become a "Lloyds surveyor".

Many years later, in December 1999, when I had decided to stop sailing (after my last stint as a Chief Engineer on a Tanker), I had come to Dubai for a family holiday and made a courtesy visit to say "hello" to Mr Will Henderson (boss-man of the then celebrated survey firm – Henderson International). He offered me a job as a "Marine Surveyor in his firm". I declined his offer because I wanted to try and become a "Lloyds Surveyor".

However, he managed to entice me to "give it a shot, for SIX months ONLY". I accepted that offer and then, the rest is history. I stayed with Hendersons for over ten years and have now completed over twenty years as a marine surveyor.

Looking back, I can proudly say that no boss can be a better "friend, mentor and guide" than Mr Will Henderson.

Sadly, he passed away whilst returning from a survey in 2010. May his soul rest in eternal peace, such gems are rarely found in anybody's lifetime. Without any doubt, the marine world lost an icon.



Mr Will Henderson

Summarily, marine surveying was (and is) my destiny and I could have never been happier in any other profession.

A power point presentation that I gave in October 2015 on the topic "Marine Surveyor's Role in New Build Supervision", at the Lloyds Building (London) was one of the high points of my career.

Presenting at the IIMS Annual Confernce 2015 in London

In hindsight, I had NOT become a Lloyds surveyor, but had at least made a presentation in the Lloyds building!

The diversity of the assignments that I have experienced have been immensely satisfying. The constant link to mariners continues to kindle the flames of nostalgic memories of sailing days.

The satisfaction of doing a good job came from the fact that Quest Marine LLC got empaneled with leading Underwriters with patronage by shipowners and P&I.

The Icing on the cake was added by IIMS HQ, when they made me an "Honorary Fellow" of the Institute. To me, this is a massive boost to my professional psyche and commits me to continue my **QUEST** for **EXCELLENCE** (which, incidentally, is also the tag-line for our marine consultancy firm – Quest Marine LLC).

Mike Schwarz presenting Uday with his Honorary Membership

Q2. What are your core areas of surveying specialisms and which give you the most satisfaction?

I am not a high-profile expert in any particular facet of surveying. Although, I consider "Hull & Machinery" surveys and "Damage Investigations" as my forte given that I am a Marine Engineer.

In my formative years of surveying, I was like a "well-oiled machine" and a hard core "vessel inspection tool". We were flooded with survey assignments and I was the only Marine Engineer in our firm. I used to spend the bulk of my time driving, or on service boats and onboard ships. So much so, there came a point of domestic stand-off, wherein I was alleged to be "more at sea nowadays" in spite of having taken up a shore assignment.

Lately, I do enjoy doing cargo damage surveys and have made considerable efforts to understand this line of work. It needs a lot of reading and learning to understand the intricate mechanisms of multiple stake-holders.

A foray into marine warranty surveys took me far and wide, globally. The thrill of tracking the ship that you have provided voyage approval for, until she reaches her destination is exciting (*weather permitting*), although stressful (*when weather is NOT permitting*).

Some of the most stressful moments have been whilst supervising or witnessing loading or discharging of "super-yachts". These high value assets can keep all stake-holders on the edge. In the process, I have worked alongside top class "super-cargos". Their confidence levels and knowledge has been awe-inspiring. The learning curve, whilst interacting with them, has been enormous.

This re-emphasizes the importance of "shadow-learning" in every marine surveyor's life. The on-job learning has diversified my mind-set and evolved me to become a better team player.

A visit to Alang in the year 2009 (the world's biggest ship-breaking yard) was a game-changer. The sight of ships being cut mercilessly was disturbing (because as a seaman I have always epitomized a ship and given it a mother's cadre). However, the harsh reality of a ship's journey (from cradle to grave) was an eye-opener and philosophic. It proved that nothing is permanent. Therefore, a pragmatic approach is the best chart in the voyage of life.

Visiting Alang - the world's biggest ship-breaking yard - in 2009

I have followed the cardinal rule of "preparing well prior to every survey". I do my utmost to do some reading and gathering historic data, so that I am on familiar ground, even before the inspection commences. Of course, the approach towards any survey has always been on a strictly non-prejudicial or non-judgemental basis.

Answer to the query of what gives me "most satisfaction" I guess, I would love to "go back to sea", simply because the life on that part of the planet is far less complicated and less congested than on land.

Q3. What in your opinion are the key attributes to becoming a successful marine surveyor in the Middle East?

I would encapsulate three main criteria and that would be "Attitude // Attitude // Attitude". The crux of the matter lies in not just what you do whilst on a survey, but in how you do it.

The second most important aspect would be to get lucky in getting the "right mentor". A mentor can make or break a prospective surveyor.

I found my mentor in Mr AWJ (Tony) Fernandez, who is also the mentor for Quest Marine LLC.

Contributions of Capt Satish Anand and Capt Zia Alam were priceless too in my professional growth.

Uday with Tony Fernandez

Uday with Capt Satish Anand (centre) and Capt Zia Alam (right)

Thirdly, the appropriate professional qualifications, coupled with effective training and association with reputed organizations, such as IIMS, are essential.

Beyond all above pre-requisites, a stable family life helps in overcoming most challenges of a surveyor's life. A supportive spouse can do wonders to assist a surveyor's growth. I have been truly lucky as the below family picture testifies.

Uday with his family

A good team is essential to act as the "oil that lubricates the wheels of any machine". I must confess that I have been blessed in finding the ideal subordinates, without whom Quest Marine would not have reached the echelons of success and recognition we have achieved.

Joel Pinheiro has played a pivotal role in spearheading the success of Quest Marine LLC and was its first pillar. He has been the architect of the Company's infrastructure and still holds the baton.

Subsequently, the growing team has added value, such that more stalwarts of the industry have joined, mushroomed and thrived.

Joel Pinheiro with Uday in London

The Quest Marine LLC team 2014

Quest Marine LLC 2019 (below) versus Quest Marine LLC 2014 (above).

The Quest Marine LLC team 2019

It must be noted that the core team and core values never changed. Newer flavours were added to enhance the professional value of the Company.

Q4. Dubai is one of the busier ports of the world, but does it present any special or unique challenges, particularly thinking about security, the hot weather and so on, for a surveyor working there?

Indeed Dubai (or let us say UAE) is the regional hub for maritime activity. It has always been the "eye of the needle" due to its geo-political location, coupled with its infra-structural ability to attract maritime trade.

The weather is indeed harsh and can be energy sapping. There have been numerous times when I have come out of a "double bottom" and almost passed out on the deck (which was above 48+ degree ambient temperature) and I asked myself why am I doing this job?

However, in due time, you re-orient yourself and carry on, since the scope of a marine surveyor's professional life is exciting and poses a new challenge in every different assignment.

Regional security is very much under control and this country provides a safe terrain for maritime activity. However, a challenge lies in the fact that all ports within the UAE follow different codes of security compliance. Therefore, meeting these different regulations (repeatedly) poses a hurdle in overall effectiveness of our performance.

However, the business-friendly infrastructure that UAE provides is phenomenal, regardless of the access controls, which needs to be accepted gracefully and adapted in the correct perspective.

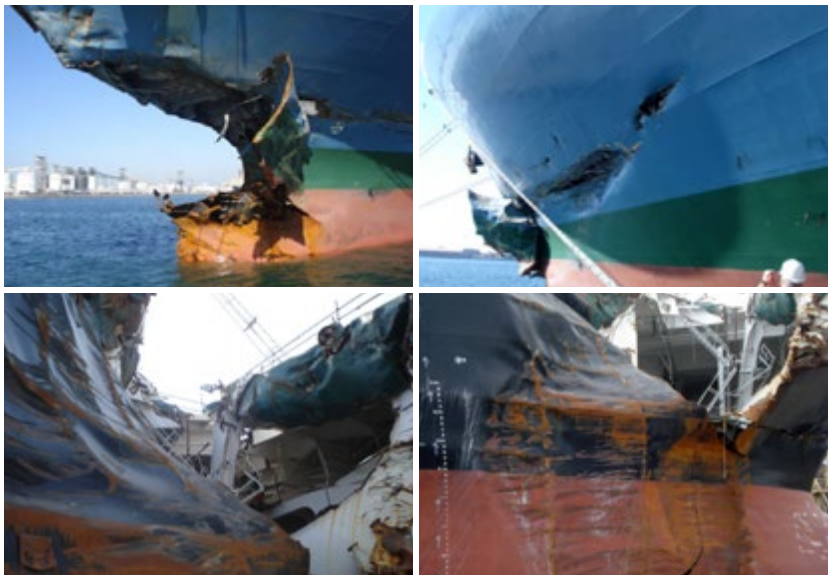
Q5. What has been the most demanding and challenging survey you have ever been involved with?

Over a period of twenty years of surveying, I am convinced that no two jobs have been the same. Each assignment has been unique in its own way and merited 200 % commitment.

Nevertheless, there are some assignments that stand out and leave an indelible mark on every surveyor's journey. So was it with me.

This incident dates back to 2007, wherein a loaded VLCC collided head on with a fully laden container vessel, whilst both vessels were underway. Numerous Underwriters, Clubs, Lawyers, Loss Adjusters, Recovery Agents and Surveyors were involved. We were representing the Hull & Machinery Underwriters of the container vessel and were also required to conduct a "without prejudice" inspection on the VLCC.

Obviously, the stakes were very high, therefore information gathering and sharing was an extremely sensitive issue. The sheer magnitude of damage and collateral ramifications was humungous. Estimated steel renewal on the container vessel was in the range of 700 metric tonnes and on the VLCC was over 900 metric tonnes.



Verification of steel damage and quantification of repair scope was an elaborate task and needed various levels of cross-checking. However, there was an underlying beauty to the entire management structure. All stake-holders were proactive and result oriented, although every minute detail was under the scanner and challenged, at every stage.

For me, it was a tremendous learning experience and awe-inspiring learning curve.

Although I have been involved in many big cases (since then), I would still rate this as the most exhilarated experience of my surveying career.

Q6. How important is mentoring in this business – learning the art of surveying from an experienced surveying practitioner?

I completed my engineering training at a Naval school in 1982. Since then, I have always been working on ships.

I switched over to a shore-based appointment in January 2000, when I started working as a marine surveyor and my own survey firm was formed in December 2010. In essence, throughout my professional life spanning approximately 38 years, post-graduation, I have either been on a ship or performed as a marine surveyor.

Based on all the above, beyond any shadow of doubt, I can emphasise that nobody can become a surveyor unless he/she is guided by a meaningful mentor. There is a plethora of books on the art of surveying and guidelines on effective surveying but none of them are a replacement for an **effective mentor**.

It is a well-known fact that no matter how many years of sea-time you may have put in, you will still be a novice when you come ashore. When we come to the stage of changing the hat the greatest challenge lies in "un-learning", prior orienting to the newer perspective of looking at shipping, as seen from shore side. This gestation period is a litmus test, during which, many stalwarts have surrendered and "gone back to sea".

Therefore, during the initial days, it is mandatory to be a "shadow – surveyor" and learn to catch the strings from a senior. The art of "being on-site effectively" is imbibed by watching your peers at work and learning from their "rights & wrongs".

The pragmatic ability of ascertaining "what is correct" over the urge to conclude on "who is correct" is something that a good mentor can gift to his protégé.
In essence, getting mentored by an experienced surveying practitioner is the nucleus around which a surveyor's effectiveness largely depends upon.

I have been lucky in getting some fantastic professional mentors, chief among them being "Mr Will Henderson, Mr Tony Fernandez, Capt Subramanium, Capt Satish Anand, Capt Zia Alam, Capt Zillur Bhuiyan, Mr Milind Tambe and Capt Saumitr Sen".

My professional career would be "Null & Void" if I do not bow my hat to Tony Sir!

I shall, forever, be indebted to all my mentors in guiding me in all aspects of my surveying life.

Q7. What is your message and advice to those making their way in what is a tough and exacting profession?

I would point blank tell prospects to stay away from this profession if they are allergic to "hard work and commitment". This profession is not for gold-diggers or for the type who believe in the "get rich quick" mind-set. In this profession, "recognition and gratification" comes on a "long term" basis and there are no short-cuts.

The journey of a marine surveyor is tough, thankless (many times), filled with perennial time constraints, challenging and tedious.

There are many sacrifices that need to be made on domestic matters in terms of time management. Therefore, finding an understanding life partner is the key to success. As reiterated earlier, I have been very lucky on this angle.

Q8. What funny instances whilst on survey can you remember that you are prepared to share with readers?

In my entire 20 years career of surveying, the below incidence is extremely bizarre, unnerving and unforgettable. In hindsight (since there has been no collateral damage), I can smile over it and have no qualms in sharing same.

This memory re-cap dates back to an incidence that happened in the month of December 2005, at Khorfakkan outer anchorage, at about 0245 hrs. On that fateful night, the sea was very rough, weather was chilly and sea water temperature was "sort of very uncomfortable for a swim".

I was to disembark from a gas tanker. The vessel was in a light ballast condition (very high freeboard).

Prior my disembarking, the vessel had already picked up anchor and was underway. Since the sea was very rough, the Master planned that he would call the service boat to make an approach on the leeward side, to minimize the wave effect, so that I could jump off the combination ladder onto the service boat (although last minute heroics were essential, for safe landing).

I was advised to put all my stuff in my haver-sack (including my camera, documents, passport submission proof, wallet, car keys and mobile phone). This bag was lowered to the boat, with a heaving line, which was safely collected by the boatman, who was standing at the boat's helm.

After untying the heaving line of my bag, the boatman signalled that I could commence my descent on the never ending pilot ladder (*...as viewed from deck, the service boat looked like a toy, bobbing on water...*).

Whilst I was midway on the ladder, a massive wave threw the boat away from the ship's side. In the process, the lowest tip of the pilot ladder got entangled with the bow fender of the boat in such a way that the pilot ladder was pulled away from the shipside (with me hanging on it, like a spider). Before we could comprehend anything, the entangled rope got detatched from the fender and the ladder started swinging like a yoyo (with me on it). I managed to keep my composure and as soon as the swinging reduced climbed back onto the ship, since the boat had moved away in the darkness and I could not stay dangling, in that abyss.

Whilst all this was happening, the boatman lost his balance and fell into the sea, between the boat and the ship. Whilst falling into the water, the boatman forgot to let go of my bag... which went down into the deep blue sea (WITH ALL ITS CONTENTS).

All emergency drills were activated to retrieve the boatman from the sea, who was hoisted onto the ship (on a life buoy). After me and the boatman had stabilized, we dis-embarked the vessel (*via the same pilot ladder*).

Everything was under control except for the fact that I had lost all my possessions, including permission to leave the Port premises or cell phone or wallet or survey findings etc. What followed was a nightmare, in putting all matters in place (*in spite of full cooperation from all parties*).

In hindsight, I cherish the memories of that night (albeit in a lighter vein), with the conviction that "Murphy's Law never fails". Whilst we prepare for the best, we should always be prepared to face the worst.

Q9. Your son, Rohan, has followed you into the marine world – how does that make you feel and how proud of him were you when he was given a special certificate by IIMS in Dubai at the end of last year to recognize his studies?

Rohan's advent into the maritime world has been the silver lining in my professional life. Every parent wants their next generation to step into the same line of work, as an acknowledgement of a good career choice (by the parent). So it was, in my case.

Having completed his mechanical engineering (followed by internship at Goltens and Clarksons and Quest Marine LLC), he obtained more marine related qualifications like a Skipper's license, qualified diver's certification. His penchant to opt to become a Marine Broker is well respected and his success is an edification of his choice.

His crowning glory, thus far, has been completing the 'Diploma in Marine Surveying, under the IIMS portal. I must confess that he worked really hard to complete all the modules on his own steam. Of course, he reached out to many external sources for assistance, including my colleagues in Quest Marine. But then, that was the desired format and mere references to reading materials and obtaining web-based information WAS NOT the promulgated norm.

Me and my wife were immensely proud when he obtained his "Diploma in Marine Surveying".

Our pride was multi-fold when he was accorded the "Student of the Year Award", on board the prestigious **Queen Elizabeth 2** (in 2019), during the IIMS bi-annual conference, at Dubai.

Rohan receiving the "Student of the Year" award in 2019 from Mike Schwarz

Q10. How might I find Uday relaxing at the end of a hard day's work?

I have multiple choices for that.

Primarily, a walk in the park revitalizes me at any time of the day or night. I connect well with the solitude and serene ambiance of nature, whilst I walk alone. My beloved wife had once gifted me a book called "In the Sphere of Silence". I am QUITE CONVINCED that she has NOT read that book, but I did finish reading it. I continue to reap benefits of the values that I imbibed from this book. I would suggest that it is a "must read book" for one and all.

My relaxation mode would be to read diverse books (not on a computer, but the paper-back version).

I do nurse a passion for hearing yest-year (ROMANTIC) melodies of Indian Bollywood movies. The poetry and purity of some of those compositions are vintage and priceless. They are integral to my "never-say-die" positive attitude and my immense belief in the power of love.

Of late (thanks to covid related lock-down) I have developed an inclination to play "on-line scrabble". It gives me a "high" whenever I score a BINGO by making words with "all seven tiles in", a regular feature nowadays (...modest confession...).

I have tremendous faith in the ability and energy of today's youth. Essentially, as part of my retirement plan, my vision board is to capitalize on my maritime experience (coupled with my oratorical skills) and become a teacher in the maritime world.

It will give me immense satisfaction and pride to impart my knowledge and experience to deserving youngsters, who aspire to enhance their professional life, by inducting themselves in the maritime industry.

My goal is to demonstrate to aspirants that it is NOT mandatory to be a seaman, to become a marine surveyor. There are numerous entry options. Primarily, they need to find a mentor and adopt the "on-job-training" model.

The aspiring youngsters need to be educated that they must enhance their knowledge by doing relevant courses for leveraging. In fact, courses conducted by IIMS could be the perfect platform.

There are so many other methods of induction, which a well-meaning youngster can easily enshrine. By being involved in all above activities, I will continue to learn more and add value to my post-retirement life.

Like my mentor Tony Sir often says, I too believe that "**being a student is a life-long process**".

Q11. What are the main attractions of living and working in Dubai?

Dubai is "home away from home", especially for people like me who hail from Mumbai, which is on the west coast of India. Lifestyles are similar and airline connectivity to my hometown are fantastic.

Dubai is a perfect harmony of modernization, finely blended with cultural values.

"Social tolerance and familial happiness" are high up on the agenda of the city fathers and decision makers. Dubai takes pride in providing "quality service" and "value for money". Cost of living has definitely increased. Gone are the days when you could earn enough to save something for the rainy days. Nevertheless, there are abundant opportunities for prospering, when you do things the RIGHT way.

Q.12 When you finally decide to hang up your surveying boots, what will you miss most?

UNDOUBTEDLY... the lure of the sea... AND the bliss therein.

Uday on the job at sea

The below image (as received from a fellow seaman) says it all... once a seaman ALWAYS a seaman.

However, I am very clear in my thoughts that "my boots will NOT hang, until I am incapable of tying the boot-laces, by my own self". After thought: No wind blows in favor of a ship that has no destination... THEREFORE... my destination will always be my QUEST for EXCELLENCE.

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