

THE REPORT

MARCH 2020
ISSUE 91

The Magazine of the International Institute of Marine Surveying



Mold (or Mould) in the Marine Environment

Critical Information for Surveyors

Hell on Water caused by misdeclared cargoes

Maritime Training 2020 and beyond - what's the fuss?

Events that shaped IIMS, the ship and boating world in the 2010s



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The Magazine of the International Institute of Marine Surveying

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EDITOR'S LETTER

Dear Colleague

Welcome to the March 2020 Report Magazine, the first of a bright new decade. I wanted to reflect on the 2010s before we confine that period to the archives and was inspired to write an article which surprised and shocked me as I researched the content. Perhaps you will have similar emotions? See page 29.

Often one forgets that marine surveyors have an entirely different life when they stop inspecting vessels at the end of a busy day. It was a pleasure to track down Capt. Bill MacDonald once again, the Institute's founding father and, in his case, this is certainly true. This time finding out about his passion for marine surveying was the last thing on my mind. Rather, I wanted to know more about the *Catriona MacDonald Foundation* which he started in South America. It is a fascinating human-interest story to warm the heart on page 34.

The first marine surveying conference of this decade took place in Baltimore back in January. We had a record attendance at the event and all present were treated to some fascinating and valuable content. There is a full report in this edition and make sure to track down the videos on the IIMS YouTube channel.

Charlie Bartlett has authored a thought-provoking article about the number of container ship fires, now common place it seems, and gives an overview of some recent tragedies and asks what can be done to stop this unwelcome trend. The feature, entitled *Hell on High Water* is on page 47.

The opinion piece on page 42 - *Maritime Training 2020 and Beyond* - is interesting. It questions whether the training model currently used for seafarers is fit for purpose, and if not, how it needs to change.

Smart technology surrounds us all these days. You know it? We have Smart Phones, Smart Vehicles, Smart Glasses, even Smart Motorways in the UK (currently the subject of much debate)! So why not Smart Containers? Dr. Hanane Becha is a key member of TRAXENS, defining the Standards Strategy enabling Smart Containers and in her article on page 69 she gives the low down on this project.

Sticking with new technology for a moment, drones continue to make their mark on the surveying profession. This issue carries two articles on the role of drones, including one about the drone thickness gauge device from Tritex.

From something new to something much older - the art of report writing. Ah yes, that old nugget I hear you say. There is always something new to learn about writing reports, a skill every successful surveyor must master. I have given a couple of presentations on this topic recently from a non-technical perspective, the content of which seems to have surprised some surveyors. In this issue (see page 64) I have incorporated my presentation and thoughts on this subject into an article which I hope will give new impetus and inspiration to those who read it.

At the time of writing, Coronavirus is taking hold and the maritime industry is trying to respond to this latest pandemic. Sometimes it seems that for all our efforts and developments with modern technology, it matters not one jot. I leave you on that sombre note and ask that if you survey internationally, please take the necessary precautions.

Survey well

Mike Schwarz
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THE PRESIDENT'S COLUMN

Dear IIMS Member

I write this column with a heavy heart. Please let us all spare a few moments of good wishes and solidarity for many of our Chinese friends, surveyors, and seafarers who are facing a very challenging time. We want them to know that at IIMS we are all supportive and are hoping for the early containment and resolution of this deadly pandemic.

Our Offshore and Shipping industries have evolved over many years. With every challenge, our industry has come out stronger so that 90% of the world's trade is still transported by sea. We are at the crux of yet another major transformation, a new era where the days of fossil fuels are numbered. In the same way that sails made way for steam engines and those, in turn, made way for liquid fossil fuel-driven engines, we are now about to change that sooner than most may have anticipated. What is going to be the new normal? Will it be dual-powered hybrid engines, followed by LNG, once they have figured

out adequate refueling avenues, and thereafter perhaps finally settling for wind-powered turbine generators or Hydrogen cells? It could be anyone's guess. That said, how are you and your team aligning yourself to fit the new normal? Are you upgrading your technological skills to meet the need? If yes, welcome to the new normal, however, if you are one of those who wish to operate from inside your comfort zone then that is fine but be prepared to face potential adversities.

Mentioning comfort zones, and being a Master Mariner, I would like to talk about propulsion systems and new fuels for the future. However, saying that, I encourage you to consider adopting as much new technology into your daily reporting styles and methods of collecting evidence as you can too. By now every one of us must be reporting and communicating electronically and utilizing our mobile smart devices more than ever before. There has already been a massive change in the last two decades and the days of pasting two photos on a page with captions

are well and truly numbered. There are many new techniques for collecting evidence these days and it should be of interest. The new Nautical Institute publication - Guidelines for Collecting Maritime Evidence, volume 2 has in chapter 6, authored by myself, some indications of the newest trends in evidence collection by marine surveyors. The famous quote goes "change is inevitable." I would add to that "do you identify forthcoming change and align yourself with the pace of that change?" If you have ideas I would love to hear them and spread the word on the latest trends. So do please drop me a line by email.

I see the IIMS being at the forefront of this developing yet very vital aspect of our independent surveying profession.

"Your" President

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Kelly Tolhurst MP is pictured with Prime Minister, Boris Johnson

FORMER IIMS MEMBER KELLY TOLHURST IS APPOINTED AS NEW UK MARITIME MINISTER

IIMS is delighted at the news that Kelly Tolhurst, an Institute member for ten years when a practicing marine surveyor, was appointed as the new UK Maritime Minister on 13 February 2020. Kelly who has been the Conservative member of parliament (MP) for Rochester and Strood since 2015, relinquished her membership only last year. She takes up this key role at an interesting time with the huge political upheaval currently underway in the UK post Brexit and IIMS would like to congratulate Kelly and wish her much success in her new role.

Prior to being appointed as Parliamentary Under Secretary of State at the Department for Transport, Kelly Tolhurst was Parliamentary Under Secretary of State at the Department for Business, Energy and Industrial Strategy from 19 July 2018.

As well as her new maritime role, Kelly also has a brief to work on aviation, security, civil contingencies and shadow roads. Her remit specifically includes work on freeports, which UK port organisations have welcomed. The UK Government this month published a new consultation on the introduction of freeports, which have a “free zone” through which certain goods can be transhipped or processed without attracting customs duties.

“Now is a pivotal time to take on the brief of maritime minister, with the current consultation on Freeports,” said Richard Ballantyne, chief executive of the British Ports Association.

“Post-Brexit trade-facilitation is also high on the agenda, as well as sustainability and port connectivity.”

Tim Morris, chief executive of the UK Major Ports Group, which represents the nation’s biggest facilities, said it was “great to see someone with a maritime background taking on the role”.

Ben Murray, director of Maritime UK, welcomed Kelly Tolhurst to her new role. he said, “As somebody who has run her own maritime business, we look forward to working closely with Kelly and the department to maintain and strengthen the UK’s position as a leading maritime nation.”

MARSHALL ISLANDS REGISTRY TO LAUNCH INVENTORY OF HAZARDOUS MATERIALS VERIFICATION SERVICE

From 31 December 2020 non-EU vessels calling at EU ports must carry an authorized Inventory of Hazardous Materials (IHM) and Statement of Compliance (SoC). The European Union (EU) Ship Recycling Regulation (EUSRR) is aimed at ensuring that ships, when being recycled, do not pose any unnecessary risk to human health and safety, or to the environment, and to ensure the proper management of hazardous materials on board ships throughout their lifecycle. The EUSRR is an early implementation of the International Maritime Organization’s (IMO’s) Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships (the “Hong Kong Convention”), which has yet to meet the criteria for its entry into force.

To support shipowners in meeting the EUSRR requirements, the Republic of the Marshall Islands (RMI) Registry has launched a new IHM verification service.

John Ramage, Chief Operating Officer of International Registries, Inc. and its affiliates (IRI), which provides administrative and technical support to the Republic of the Marshall Islands Maritime and Corporate Registries, commented, “Preparing an IHM requires considerable planning and coordination, and we urge shipowners to take the required steps to meet the EUSRR requirements as soon as possible. We understand that regulatory requirements are continuing to become more complex for owners, and we want to do all that we can to help them manage their inspection and compliance procedures. Utilizing our team to verify the IHM and issue the SoC provides owners with a new option for receipt of the SoC.”

The ship specific IHM needs to be reviewed and verified by the RMI or one of the approved International Association of Classification Society (IACS) Recognized Organisations (ROs), and upon verification, an SoC issued to the vessel. While the EUSRR regulation seeks to prevent hazards during the recycling phase, the IHM and SoC must be maintained for the entire vessel lifecycle.





EUROPEAN YACHT OF THE YEAR 2020 WINNERS ANNOUNCED

Europe's best sailing yachts are awarded the "Oscar of water sports" in a total of five categories every year. For the seventeenth time, the international award "European Yacht of the Year" was presented on Saturday 18th January during the Flagship Night of boot Düsseldorf and Delius Klasing Verlag.

Every year, around 60 new sailing boats are launched on the European market. But only five shipyards can celebrate the title "European Yacht of the Year 2020". The tests took the jury members of the twelve sailing magazines from all over Europe to Port Ginesta, south of Barcelona, in October 2019. All 16 candidates were thoroughly tested and evaluated. In total, the specialised journalists covered almost 2,500 nautical miles with the nominated yachts.

This year's winner in the Family Cruiser category was the Beneteau Oceanis 30.1. In the Performance Cruiser category, the X 4.0 scooped the top prize.

The Innovation-Award was awarded to the ClubSwan 36, the latest model of the luxury brand, Nautor. "It feels like being on a flying carpet," says Jochen Rieker, editor-in-chief of YACHT magazine and chairman of the expert jury. "The most amazing thing about it is that the ClubSwan delivers its impressive performance values without so much as a snag or a stutter."

In the Luxury Cruiser category, the Amel 60 triumphed.

During the nomination of the current candidates, it was evident that the number of fast, easily manoeuvrable racing yachts is greater than ever. To do them justice, the jury created a new, separate category (Regatta Yachts). In this group, the Dehler 30 OD from Greifswald claimed the title.

Read the full article at <https://bit.ly/2RFgksf>

THIRD GENERATION MARINER TO SEEK OUT THE FUTURE OF UK MARITIME'S BRIGHTEST TALENT

A third-generation mariner has been appointed chair of a new skills commission.

Professor Graham Baldwin will lead the Maritime Skills Commission, which is being set up to better understand the existing and future skills needs of the industry both on land and at sea. It will future proof training for the 220,100 people working in the sector, including for the 27,000 employed at ports around the country.

Starting work in the coming months, the Commission will bring together leading maritime experts to report on the changing needs of the industry, make recommendations and ensure its workforce has the talent it needs for today, the next 30 years and beyond.

Professor Graham Baldwin said:

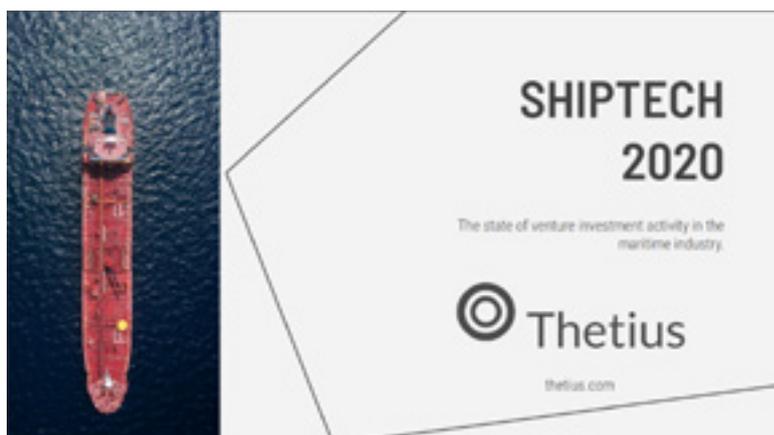
"I am delighted to have accepted the prestigious position of Chair of the Maritime Skills Commission, a core element of delivering the Maritime 2050 Strategy.

"All parts of the maritime industry are critical to the future of the UK and I am excited to be able to contribute to its continued success."

Graham is the Vice-Chancellor of the University of Central Lancashire having previously been the Vice-Chancellor of Solent University, Southampton for five years. Maritime is in the Baldwin family genes, with Professor Baldwin's grandfather working as a trawlerman out of Fleetwood. He is an Honorary Professor at Hebei University and a Visiting Professor at the National Academy of Education Administration in Beijing. In 2014 Hebei Province, China conferred on him the title of 'Outstanding Foreign Expert'.



Professor Graham Baldwin



SHIPTECH 2020 REPORT REVEALS THE SCALE OF VENTURE FUNDING INVESTED IN MARITIME LAST YEAR

According to the Shiptech 2020 report, over \$1bn was invested in technology companies working in the maritime sector in 2019.

The Shiptech 2020 report, published by technology research and innovation consultancy Thetius, found that 2019 was a record year for venture capital investment in the maritime sector. However, the headline figure is distorted by the massive \$1bn investment in Flexport,

led by Softbank's Vision Fund. If Flexport's contribution is removed from the figures, venture funding in the industry actually declined by 24%, from \$190m in 2018 to \$144m in 2019. Overall, 8% fewer deals were made through the year compared with 2018, though the average size of deals has increased by 18% from \$2.2million to \$2.7million in 2019.

"The fall in the number of investments coupled with the increased average size of each round shows that the market is at the early stages of maturing," said Nick Chubb, founder of Thetius and author of the report, "after years of seed and small venture rounds dominating funding activity, a few breakout stars are beginning to scale and have enough traction to warrant taking significant amounts of investor money."

As well as an overview of venture activity, the Shiptech 2020 report examines startup activity throughout 2019 including the notable investments made throughout the year, the new entrants to the market who are ones to watch, and the technology trends to be aware of in 2020.

WHAT NEWS OF THE WORLD'S LARGEST ELECTRIC FERRY NINE MONTHS ON FROM ITS FIRST COMMERCIAL VOYAGE?

In August 2019, Leclanché (battery system provider) announced the world's largest electric ferry had completed its first commercial voyage when Ellen connected the ports of Søby and Fynshav in Denmark.

Nine months on, Halfdan Abrahamsen, an information officer from Ærø EnergyLab, tells the BBC: "Ferry shipping in general is very dirty business." Ships usually use marine diesel or heavy fuel oil, "which is just about the bottom of the food chain when it comes to product from refineries". But he says, the only oil onboard Ellen is for the gearbox and in the kitchen for making French fries.

Powered entirely by batteries, Ellen is something of a Tesla among ferries. Fully charged, the 60m vessel can sail 22 nautical miles with up to 200 passengers and 30 cars onboard. That's a roughly 40km (25-mile) round-trip, and seven times further than other electric ferries.

The 840 lithium-ion batteries supplied by Swiss firm Leclanché, are stacked from floor to ceiling in two battery rooms.

Totalling 4.3MWh, this is the largest battery capacity at sea and equivalent to the average amount of electricity a UK household consumes each year.

After a 70-minute voyage, Ellen arrives at the harbour in Søby and moors alongside the charging station. A mechanical arm plugs in and recharges the batteries in less than 25 minutes with clean energy supplied by local wind turbines.

Ellen is not fully operational just yet, and it hasn't all been smooth sailing. Building a boat with so many batteries is complex and since being launched some battery cells have been replaced, says the BBC.

Read the full article at <https://bit.ly/2S2rbez>



SANTA ISABELLA: ENGLISH COURT CLARIFIES OWNER AND CARGO VENTILATION AND CARE OBLIGATIONS

The English Commercial Court has provided a ruling in the case of *Alianca Navegacao e Logistica Ltda v Ameropa SA (The Santa Isabella)* [2019] EWHC 3152 (Comm) which provides useful guidance on:

- the legal test for a usual and customary route; and
- owners' obligation to ventilate and care for cargo.

Key facts in the case

Alianca, the disponent owner of the bulk carrier *Santa Isabella*, chartered the ship in 2016 to Ameropa to carry a cargo of corn and maize in bulk from Topolobampo, Mexico to Durban and Richard's Bay, South Africa. Upon arrival at Durban, significant condensation (ship's sweat) was found to have damaged the *Santa Isabella's* cargo such that a 'light crust' had formed on the surface of the cargo and this had to be removed. The authorities refused to allow the cargo to be discharged due to its apparent condition which included a suggestion that it included toxins. This caused extensive delays to discharge operations. Considerable delays were incurred both at Durban and Richards Bay as a result of the condensation damage to the cargo.



Claim

The disponent owners brought a claim for demurrage and associated expenses (liquidated damages for delay) for the time the *Santa Isabella* was delayed in South Africa. The charterers sought to defend the claim, relying upon the rule in the 19th century case *Budgett v Binnington* [1891] 1 QB 35 that charterers will not be responsible for laytime or time on demurrage when such time has resulted from the fault of owners.

Charterers alleged that owners were at fault for the delays and damage and in breach of their charter party obligations to care for the cargo. Their arguments included:

1. The route taken by owners via Cape Horn was not the usual and customary route when the Panama Canal route was shorter and less risky to the cargo. The choice of route had resulted in damage to the cargo;
2. Owners had failed to properly ventilate the cargo in accordance with a sound system, resulting in damage and delay; and
3. Owners had failed to properly disinfect the topsides outside the cargo holds following loading, resulting in insect infestations causing damage and delay.

The owners countered that:

1. The Cape Horn route was the usual and customary route and was permitted by the charter party;
2. Ventilation was properly carried out when it was safe to do so and when fumigation restrictions allowed. The weather and sea conditions prevented ventilation for the majority of the journey and that was not the fault of owners; and
3. The loadport fumigation operations used three times the recommended dose and owners had complied with their disinfection obligations.

Judgment

Mr Justice Henshaw sitting in the English High Court found that the cargo had suffered extensive damage on arrival at Durban. He ruled that:

1. **Owners were entitled to take the route around Cape Horn.** The judge ruled that the route was a usual and reasonable route for the purpose of identifying the contractual route and did not amount to a deviation. He added that owners may choose to take a longer route than the most direct route, but in order to comply with contractual obligations, it must be both usual and reasonable bearing in mind the interests of all involved. Both commercial considerations and care of the cargo may be relevant. However, owners are not required to undertake a refined analysis of the climactic conditions likely to be experienced on route.
2. **Owners had failed to properly and carefully ventilate the cargo in accordance with a sound system.** The judge found that this failure was a breach of owners' duty to care for the cargo and the breach resulted in cargo damage and delays at the discharge port. However, he ruled that there would have inevitably been a crust of damaged cargo and awarded nominal damages to owners for the demurrage attributable to removing this surface crust.
3. **Owners had failed to properly disinfect the topsides of the cargo holds which was the likely cause of the insect infestations discovered at Durban.** It was found that owners were in breach of Article III Rule 2 of the Hague Visby Rules, which were incorporated in the charterparty.

Read the full article at <https://bit.ly/2u4Necx>



CODECASA LAUNCHES 70M SUPERYACHT CONCEPT CODECASA JET 2020

When imaginative virtuosity combines with old age traditions and knowledge, a unique work of genius is created, the Codecasa Jet 2020. The concept is an invention blending inspirations from aviation architectures, and the luxuries of a superyacht.

The 70-metre (230-foot) Codecasa Jet 2020 superyacht is the latest innovation by Codecasa. The new project is the

brainchild of Fulvio Codecasa's insight and hand, featuring a solid and rounded shape resembling the bow of a Cargo ship to give access to the mooring area. The central body mimics a fuselage, but with a remarkably sized sundeck which extends to the aft section of the superyacht. This provides a wonderful place to relax, boasting a recessed swimming pool of six metres by two metres with large sunbathing mattresses and a covered gymnasium.

The building of Codecasa Jet 2020 is to commence during the first half of 2020. She will be kitted out with the newest technical equipment available to market, such as radar antennas to be installed inside carbon fibre does, in the classic style of the AWACS aeroplanes.

OIL COMPANIES ASKED TO EXPLAIN HOW THEIR NEW SUPER POLLUTANT SHIPPING FUELS HAVE COME TO MARKET

Responding to the discovery that some of the new blended low sulphur shipping fuels developed and marketed by oil companies to comply with IMO 2020 air pollution standards will actually lead to a surge in the emissions of a super pollutant known as Black Carbon, the Clean Arctic Alliance is calling for the International Maritime Organization (IMO) to support an immediate switch to distillate fuels for ships in the Arctic and develop a global rule prohibiting fuels with high Black Carbon emissions.

"If immediate action isn't taken by the International Maritime Organization, the shipping industry's use of very low sulphur fuel oil – introduced to comply with the 2020 sulphur cap – will lead to a massive increase in Black Carbon emissions, and this will both accelerate the melting of Arctic sea ice and have a major impact on Earth's climate," said Dr Sian Prior, Lead Advisor to the Clean Arctic Alliance, a coalition of non-governmental organisations working for a ban on heavy fuel oil for Arctic shipping.

Very low sulphur fuel oils have been introduced in response to the 2020 sulphur cap, the IMO's regulation that enforces a global fuel sulphur limit for shipping at 0.50% from 1 January 2020, in order to protect human health and the environment. A paper submitted by Germany and Finland to the IMO's PPR7 meeting in February found that these new blends contain high levels of aromatic compounds which, when combusted, lead to an increase in emissions of Black Carbon when compared with heavier fuels and distillate fuels. Black carbon is a short-lived climate forcer, second only to CO₂ in terms of international shipping's contribution to global climate. Black Carbon represents 7% to 21% of shipping's overall GHG equivalent impact on the climate.

"There are serious questions to be answered about how these blended super pollutant fuels ever came to market. It beggars belief that amidst a global climate crisis, the marine fuel industry could develop these very low sulphur fuel oils without knowing their effect on Black Carbon emissions and the climate, particularly in the Arctic – especially as the IMO has spent almost a decade considering how to reduce Black Carbon emissions from shipping," said John Maggs, Senior Policy Advisor at Seas at Risk.

The Clean Arctic Alliance has written a letter containing the following questions to representatives of the marine fuel industry who prepared the definitive guidance on the supply and use of 0.5% sulphur marine fuel only months ago, to ask:

1. Were you aware that these new low sulphur heavy fuel blends had higher aromatic content?
2. Were you aware of the link between higher aromatic content in fuels and higher Black Carbon emissions?
3. If the answer to the above questions is "yes", then why did you not immediately seek to halt the production of these fuels and alert the IMO?

Watch this space as further developments inevitably unfold as the debate rages.

MEN JAILED FOR SMUGGLING £60M OF COCAINE INTO THE UK ABOARD YACHT

Two men have been sentenced to a combined 33 years in jail after they were caught smuggling £60 million of cocaine into the UK aboard a yacht.

Gary Swift, 53, and Scott Kilgour, 41, were stopped off the Welsh coast and were found with 751 blocks of high-purity cocaine. The pair were arrested on board. The two men had attempted to import the drugs from Suriname, South America, into the UK on board their sailing yacht SY Atravido.



When arrested, Swift said to the officers, "I just want to say that I am guilty. I have got something substantial on the boat and they will find it." He later admitted, "I'm the bad one here," and requested that the custody officers passed a message onto the MCA, informing them of how many packages were on board the yacht. Kilgour had bought the vessel in December 2018 from a seller in Mallorca, Spain for €50,000.

LARGEST VESSEL EVER BUILT BY ROYAL HUISMAN EMERGES FROM THE YARD

The colossal 81-metre (266-foot) schooner is truly a breath-taking achievement and the biggest superyacht to come from the Royal Huisman yard in Vollenhove. SEA EAGLE II is the yard's largest ever yacht to be made, a grand creation by Dykstra Nava Architects and designer Mark Whitely.

The SEA EAGLE II will be the world's largest aluminium sailing yacht with an imposing overall length and sturdy plumb bow, making her not only powerful but also renowned across the world. She is set to be delivered to her owner early this year, and is on schedule for her carbon composite Rondal Panamax rig to be installed upon launch at Royal Huisman Amsterdam to ready her for sea trials and on-board crew training.

In total, 21 yachts were either new constructions or refit projects for Royal Huisman and Husfit in 2019, and the team is now more flexible capacity wise than ever before, working in close collaboration with selected and highly qualified co-makers for specific projects in Vollenhove, Amsterdam and flexible locations. These partnering companies work closely together with Royal Huisman's in-house team.





CANAL & RIVER TRUST INCREASES ANNUAL BOAT LICENCE FEE BY 2.5% WITH WIDEBEAMS SET TO PAY MORE

The annual increase in boat licence fees for 2020 has been set by the Canal & River Trust at 2.5 percent, but other changes implemented at the same time will include the first stage of a phased introduction of higher charges for wider craft.

The increase, based on a standard inflation index, will see the cost of an annual canals and rivers licence for a typical 'go anywhere' 57ft narrowboat rise on 1 April 2020 from £985.79 to £1,010.43. But at the same time, the first of a series of extra increases for widebeam craft (announced following the 2017 licensing review) means owners of craft more than 2.16m (7ft 1in) wide face an additional increase of 5%, bringing the price for a 57ft widebeam up to £1,060.96.

A further increase in 2021 will raise the widebeam surcharge to 10%, and for vessels over 3.24m (10ft 7¾in) wide it will be followed by two further increases, creating a 20% price differential from 2023 onwards. The prices are eligible for a prompt payment discount, currently set at 5%. This is to be halved to 2.5%, but at the same time a new discount of 2.5% for online or direct debit payment will be introduced, so for many boaters the increase will make no overall difference.

WINNERS OF THE 2020 MOTORBOAT AWARDS ANNOUNCED

The winners of Motor Boat and Yachting 2020 Motor Boat Awards were announced at boot Düsseldorf in January 2020. With 11 categories, and plenty of nominations for each, the judges' winners were announced at a sparkling dinner.

The winners are:

Sportsboats and RIBs

The Brig Eagle 8 shows how RIBs "have been transformed from tough workhorses to desirable and very practical leisure boats".

Superboats

The Fairline F//Line 33 is "even more thrilling to drive than the bare statistics had promised".

Sportscruiser up to 40ft

The Galeon 335 HTS is "peppered with practical touches like an abundance of deck storage and an engine room with excellent access for daily checks".

Sportscruiser over 40ft

The Palm Beach GT50 has "impeccable natural balance, impressive speed and fuel economy and a ride quality that is nothing short of sublime".

Wheelhouse & Cockpit Cruisers

The Jeanneau Merry Fisher 895 Marlin is "safe and predictable with a decent turn of pace from twin outboards".



Adventure yachts

The Dale 40's "resilience and robustness when faced with huge swells and snarling chop was nothing short of miraculous".

Flybridges up to 60ft Winner

Ferretti 450's "quality, attention to detail and fit are worthy of a model twice the size".

Flybridges over 60ft

Sunseeker 76 Yacht's "foredeck appears to have been plucked from a 100-footer".

Custom Yachts

Bluegame BGX70 has a "design so radical it alters the fabric of what we believe is achievable".

Customer Service Award

Bates Wharf Marine Sales makes "everyone feel welcome whatever their budget or level of experience".

REPORT bites

Klaus Lysdal commenting on misdeclared cargo, said, "Some of the carriers' initial steps to impose fines may help. But if this persists, it could result in mandatory manual inspections or similar moves to protect against these types of issues. But something has to happen as we cannot keep having fires happening onboard vessels."

"Up to two thirds of recreational boating fatalities could have been prevented if lifejackets had been worn. Boaties should always follow the boating safety code - wear life jackets, carry at least two waterproof ways of calling for help, check the marine weather, avoid alcohol, and be a responsible skipper."
Baz Kirk, Maritime NZ

INTERCARGO is celebrating its 40th anniversary in 2020.

Korean shipping company Hyundai Merchant Marine (HMM) is set to join the elite club of megaship owners. HMM is scheduled to start taking delivery of its twelve 24,000 TEU boxship newbuilds, the largest containerships in the world, in April.

At the height of the recent bushfires, Svitzer Australia provided three vessels to assist in ongoing efforts to evacuate residents in Eden, New South Wales. The company said that the tugs Wistari, Cooma and the pilot boat Mersey had all been operating in support of evacuation efforts.

The world's largest shipping association BIMCO has announced it has appointed David Loosley as its new Secretary-General & CEO with effect from June 2020.

Torqeedo and ZF have announced that the two companies will integrate ZF's steerable saildrives into Torqeedo's Deep Blue system.

A giant LNG bunker vessel, which will be operated by French energy giant Total and owned by Japanese shipping company Mitsui O.S.K. Lines (MOL), has completed sea trials in China. The 18,600 cbm newbuilding is described as the world's largest vessel of this type.

Safety Briefings

CONTAINER SHIP WASHINGTON LOSS OF 137 CONTAINERS: MAIB INVESTIGATION REPORT PUBLISHED

At 0127 on 20 January 2018, the UK flagged container ship CMA CGM G. Washington unexpectedly rolled 20° to starboard, paused for several seconds then rolled 20° to port. The ship was experiencing heavy seas in the North Pacific Ocean while on passage from Xiamen, China to Los Angeles, USA. As the sun rose later that morning, it was discovered that container bays 18, 54 and 58 had collapsed; 137 containers were lost overboard and a further 85 were damaged.

The MAIB investigation concluded that the collapse of all three bays probably occurred during the 20° rolls. The amplitude of the rolls exceeded the container ship's estimated roll limits and was almost certainly the consequence of parametric rolling, which had been recorded by the ship's motion monitoring decision support tool. The risk of parametric rolling was not identified by the master or his bridge team because they were unaware of the full capabilities of the decision support tool, and therefore were unaware of its predictions.

The investigation identified several factors that would have adversely affected the safety of the container stows on deck. These included: reduced structural strength of non-standard 53ft containers, inaccurate container weight declarations, mis-stowed containers and loose lashings.

The report concluded that:

- Bay 54 collapsed because the acceleration forces generated during the large rolls exceeded the structural strength of the non-standard 53ft containers stowed in the bay.
- Bay 58 collapsed because some of its containers were struck by the 53ft containers as they toppled overboard.
- Bay 18 collapsed as a result of a combination of factors and was probably initiated by the structural failure of one or more containers.

Recommendations have been made to:

- CMA ships, to ensure that, where container terminals routinely weigh containers prior to loading, the cargo plan is updated to reflect these weights.
- The Maritime and Coastguard Agency, to promote UK container owners' involvement in Bureau Internationale des Containers databases.
- Bureau Veritas, to amend its rules to require the approved lashing software installed on the onboard loading and lashing computer to calculate and display maximum roll and pitch angles associated with ship loading condition and intended passage; and, review its rules and approval procedure to ensure Container Safety Certification data is accurately reflected within the container ship's loading and lashing computer, whatever the type of container, compliant with ISO standard or not.

Read the report in full at <https://bit.ly/2GwnpVq>



OFFICIAL REPORT IDENTIFIES COCONUT CHARCOAL AS LIKELY CAUSE OF THE FIRE ON THE YANTIAN EXPRESS

The Federal Bureau of Maritime Casualty Investigation (BSU) has published its investigation report about the causes of the fire in the area of the deck cargo on board the container ship Yantian Express, identifying coconut charcoal as the likely cause of the fire.

It was during the early morning hours of 3 January 2019 that fire broke out in the deck cargo in the area of cargo hold 2 on board the German flagged container ship Yantian Express. The ship was in the North Atlantic, due to reach Halifax, Canada the following day.

Despite the action taken by Smit Nicobar, the fire spread further into the deck area of cargo hold 1. Due to the overall deteriorating situation the Yantian Express's crew left the ship and transferred to a tug.

On 7 January 2019, the Maersk Mobiliser reached the scene and took over the firefighting operations. Given that the extent onboard the burning ship seemed safer than on 9 January 2019, five crewmembers returned to the vessel voluntarily.

On 25 January 2019, the shipping company declared the general average in connection with the fire on board the vessel. The Federal Bureau of Maritime Casualty Investigation started its investigation on board after the ship had arrived.

On 30 January 2019, tug and tow reached the anchorage of the port of refuge in Freeport, Bahamas. Several days later, the ship was allowed to sail into the port. On 19 February 2019, the unloading the containers in the area of cargo holds 1 and 2 started.

The BSU stresses that one of the containers was laden with coconut charcoal, which had been erroneously declared as coconut pellets.

Read the full 73 page pdf report: <https://bit.ly/2T8GzXy>



MARITIME NZ ISSUES A SAFETY UPDATE ON THE RISKS OF FIXED GAS FIRE EXTINGUISHING SYSTEMS ON VESSELS

Maritime NZ has produced a safety update to advise of the potential problems and risks that can occur from fixed gas fire extinguishing systems on vessels, focusing on CO₂ systems. A fixed gas fire-extinguishing system is a gaseous substance (often CO₂) in a cylinder separate from, but connected to, a protected space and is used to fight a fire. Commonly fixed systems are installed for engine rooms and pump rooms. After air vents are closed and the area sealed, the gas is released in bulk quantity to flood the protected space and smother the fire.

There are many challenges occurring from these fire extinguishing systems, one of which is when the air is not tight. The system will be ineffective if the protected space is not fully closed down.

Another safety risk is the unknown structural design issues that could arise, meaning any changes to the vessel, such as new wiring, pipes and cabinets, which may impact the effectiveness of fire suppression by inadvertently creating new air pathways.



Concluding, people can be severely threatened from high concentrations of CO₂, keeping in mind that accidental release of CO₂ may lead to death, as it happened back in May 2019, when a carbon dioxide leak that occurred on a cargo ship at the Longyan port in Weihai, China, resulting to 10 people losing their lives and 19 injured.

So, to prevent any of the dangers and concerns expressed above, Maritime NZ presents actions to be taken to ensure safety.

Read the Maritime NZ safety briefing in full at <https://bit.ly/318n819>

REPORT bites

AMSA reports that the master of a ship has been convicted after failing to report without delay a main engine breakdown off Queensland, Australia that affected the safety, operation and seaworthiness of his ship.

Commenting six months after the launch of the world's largest electric ferry, Halfdan Abrahamsen, told the BBC, "Ferry shipping in general is very dirty business. Ships usually use marine diesel or heavy fuel oil, but the only oil onboard Ellen is for the gearbox and in the kitchen for making French fries."

Shanghai has maintained its position as the busiest container port in the world after handling approximately 43.3 million TEU in 2019. The figures were attributed to Shanghai Mayor Ying Yong and his government work report. "Shanghai will serve as a crucial port for international container transportation in the Asia Pacific region," Ying was quoted as saying.

At least \$1 trillion of investment in new fuel technology is needed to enable the shipping industry to meet U.N. targets for cuts in carbon emissions by 2050, a study published recently showed.

Cryostar and KC LNG have been awarded a contract to build an LNG ship bunkering and fuelling facility at the Port of Antwerp. They are set to commission the LNG facility in the first quarter of 2020.

According to the Shiptech 2020 report, over \$1bn was invested in technology companies working in the maritime sector in 2019.

Member authorities of the Tokyo and the Paris Memoranda of Understanding on Port State Control are again signalling that they will take a firm line in enforcing the IMO 2020 fuel sulfur limits. "Emphasis is therefore placed on the requirements entering into force on 1 March 1 2020 prohibiting the carriage of non-compliant fuel, for use on ships not equipped with EGCSs," said a recent release.

Safety Briefings

SUGAR BEET PULP PRONE TO IGNITION WHEN MOISTURED AND HEAPED REVEALS INVESTIGATION REPORT

The Federal Bureau of Maritime Casualty issued an investigation report on vessel "Ventura", to look for the causes that resulted to the vessel's cargo tanks and cargo being burnt down, highlighting that sugar beet pulp is prone to ignition when moistured and heaped.

The vessel was transmitting about 4,811 mt of sugar beet pulp with no added molasses. The vessel sailed by the Kiel lighthouse at 11.00, and at 12.00 smoke was noted onboard the vessel and triggering the fire alarm. Following, the regional vessel traffic service was immediately informed, which then assigned the vessel to an emergency mooring off Vossbrook on the Kiel Firth.

The vessel sailed rapidly to Kiel Ostuferhafen port at 21.00, where it partly unloaded the cargo onto the pier using the port's dredger and extinguished there by the Kiel Fire Service.

BSU concluded that:

It is not possible to clearly determine the cause of the fire. However, there is a reason to believe that the cargo's maximum moisture content was partially exceeded due to the effect of rain when sugar beet pulp was loaded from the open troughs.

Safety recommendations:

The federal bureau of marine casualty investigation recommends that:

- The owner of the vessel should advise the masters and chief officers of the importance to comply with the regulations according to the IMSBC Code.
- The owner should advise the ship's command to the effect that if solid bulk cargo is loaded from open thoughts or the like, which are not protected ashore from any type of precipitation, new samples must be taken in respect of the moisture content and that parts of the cargo must be excluded from loading if required limit values are not met.
- The owner should consult its ship's command that the niches in which cargo hold lights are located should be sealed when loading solid bulk cargo, so that it can not pass through their protective grating and come into direct contact with the lights.

COMBUSTIBLE FURNISHINGS CONTRIBUTED TO EXTENT OF FIRE ON GRAND SUN SAYS ACCIDENT BRIEF

The National Transportation Safety Board (NTSB) has released a Marine Accident Brief about the fire on the offshore supply vessel Grand Sun, noting that substantial use of combustible wood paneling and drapery contributed to the extent of the fire.

The NTSB determined that the probable cause of the fire was the overheating of electrical wiring associated with a chest freezer or the receptacle powering it, which was located in an accommodation space. The crew were alerted to an unusual smell on board but it took several searches to discover that a pile of four foam work vests were on fire. The work vests were stored on the chest freezer located on the starboard side forward, in the upper passenger compartment, behind the door leading to the wheelhouse.

>>

Contributing to the extent of the fire damage was the substantial use of combustible wood paneling and drapery throughout the accommodation spaces. This allowed the fire to rapidly expand, consuming the superstructure and the accommodation spaces below the main deck.

The fire damage caused the vessel to lose electrical power and then the fire pumps supplying the water hoses shortly after the crew began fighting the fire. The crew attempted to reach the fire extinguishers, but they were inaccessible due to the intense heat. Since there were no other accessible fire pumps aboard, the crew was unable to effectively fight the fire and was forced to retreat to the stern of the vessel.

NEW JOINT INDUSTRY REPORT GIVES RECOMMENDATIONS FOR ENHANCED BATTERY SAFETY ON VESSELS

In collaboration with the Norwegian, Danish and US maritime authorities, battery manufacturers, system integrators, suppliers of fire extinguishing systems, shipyards and shipowners, DNV GL has released a new report on battery safety in ships. The report assesses explosion and fire risks in maritime battery installations and the effectiveness of fire extinguishing systems in the event of a battery fire.

"Batteries onboard ships are both environmentally friendly and cost-effective solutions that we wish to see more of in the future. This project has been important in learning the risks of these systems and using the new insight to improve safety requirements," says Lars Alvstad, Acting Director of the Norwegian Maritime Authority.

A battery fire can produce very hot fires, as well as the risk of explosion due to gases produced by the battery. DNV GL's new report presents the results of research on what happens during a fire in a battery compartment, the release of gases, and the usefulness of various extinguishing systems in combatting the fire and preventing explosions. One of the most important findings concerns ventilation systems, which are critical to avoiding an accumulation of explosive gas. The report concludes that ventilation alone will not adequately mitigate gas accumulation if a significant portion of the battery system ignites.

"In addition to fire suppression and ventilation, the battery design must have preventative safety barriers so that the fire and gas emissions are limited to as small a part of the battery system as possible," says Henrik Helgesen, Project Manager for the research project and Senior Consultant at DNV GL.

Read the report in full at <https://bit.ly/2Rwto2R>

MOB RECOVERY EQUIPMENT AND DRILLS INSPECTIONS TO BE WITNESSED BY MCA SURVEYORS FOLLOWING MAIB REPORT

The UK Marine Accident Investigation Branch (MAIB) has published its report on the investigation into an accident where a tug's chief engineer lost his life boarding his vessel. The MCA has instructed its surveyors to witness inspections of MOB recovery equipment and drills following the MAIB report.

The tug was carrying out typical shiphandling and standby duties at a UK oilterminal, on this occasion involving changing its standby berth due to inclement weather. While sailing, the tug's chief engineer went ashore to release the mooring lines but fell through the gap between the fender and the oil stage while attempting to re-board. He was wearing a full set of PPE including helmet, safety boots, hi-vis jacket and auto-inflating lifejacket with a PLB and crotch strap fastened. His lifejacket inflated automatically, and his crewmates quickly recovered him alongside the tug, they were unable to lift him from the water however as he became incapacitated in the cold water and lost consciousness.

He was recovered by a local rescue boat and despite its crew's efforts applying CPR and being transferred to hospital the chief engineer suffered cold water shock followed by cardiac arrest from which he did not recover.

MAIB examined in detail the difficulties recovering persons from the water including use of rescue slings and davits, also Jason's Cradles which the tug in question was equipped with. It is worth noting that despite the tug having a crew of four (including the chief engineer) they faced enormous challenges in attempting to recover him.

Following the accident the MCA has issued instructions to its surveyors to ensure inspections of MOB recovery equipment and drills are witnessed at biennial inspections.

REPORT bites

Cryostar and KC LNG have been awarded a contract to build an LNG ship bunkering and fuelling facility at the Port of Antwerp. They are set to commission the LNG facility in the first quarter of 2020.

In a recent visit, the former UK Maritime Minister, Nusrat Ghani, hailed the Port of Blyth as one of the leading lights in the British maritime industry's push for a greener, cleaner future. She said, "The Port of Blyth is not only one of our key ports as a global trading nation, but also a fantastic example of the thriving offshore wind sector that is boosting renewable energy across the UK."

There is soon to be a change in French laws affecting where yachts over 24 metres will be able to anchor. This is in order to protect endangered marine species, especially the Posidonia. As of 3rd June, regulations will ensure that wildlife must not be damaged due to boating activities.

ICS has released new Guidelines for Shipowners to Avoid Age Discrimination On Board Ships. "Age discrimination is a form of unfair treatment and the age gap between employees in the workplace can now be as much as 50 years," says Natalie Shaw, Director of Employment Affairs at ICS. "We are seeing a changing global workforce that is continuing to work longer, yet there are still many stereotypes associated with age that can play out on board ship."

Research in the UK reveals many don't know to dial 999 for coastal emergencies. Last year, countless lives were saved because someone knew to call 999 in an emergency at the coast and ask for the Coastguard. But shockingly, research carried out by the MCA shows in some parts of the UK more than half still don't know who to call.

A Spanish banker has been sentenced to 18 months in jail and fined €51.7 million (approx. £44m) for attempting to smuggle a famous Picasso painting out of the country aboard a sailing yacht.

Safety Briefings

USCG WARNS OF POTENTIAL CRUSHING HAZARD UNDERNEATH RETRACTABLE PILOTHOUSES

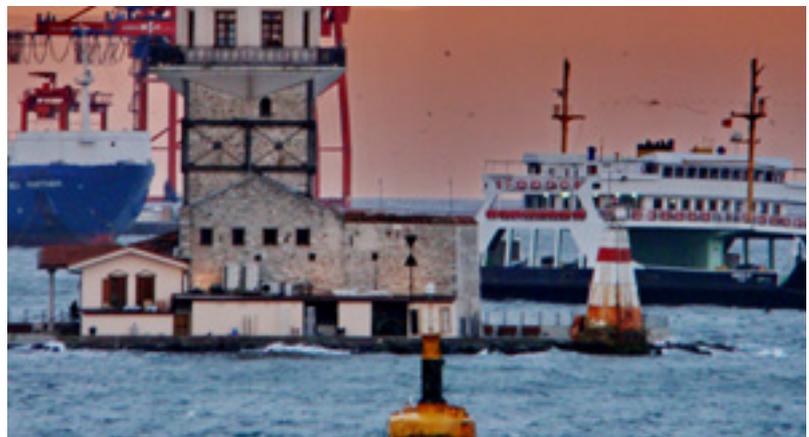
The U.S. Coast Guard has issued an alert to towboat operators about safety hazards associated with retractable pilothouses. These specialized hydraulic systems are sometimes used on towing vessels designed for low air draft restrictions.

Retractable pilothouses give towboat operators on waterways with fixed bridges the ability to lower the house and pass underneath, then raise the house to get a clearer view over their barge tows. While useful, when a pilothouse is being lowered, it presents a crushing hazard to personnel below. Some retractable pilothouses may also be operated in an "emergency mode" that increases the rate of descent and provides less time for workers to recognize the situation and get clear of the danger zone.

At present, there is no explicit requirement for the hydraulics systems operating these retractable pilothouses to be fitted with fail-safe features. Absent a fail-safe device, the failure of the hydraulic cylinder or other system component may not provide enough time for a crew member to recognize the hazard, exit the danger zone and avoid a catastrophe. Some retractable pilothouses may also lack any alarms that would warn of emergency mode operation, increasing the risk to personnel.

The Coast Guard strongly recommends that towing vessel operators who use retractable pilothouse towboats should take the following safety measures:

- Ensure pilothouses are installed with mechanisms capable of returning the pilothouse to a fail-safe locked condition in case of a failure or malfunction;
- Ensure the pilothouses are equipped to sound an audible and visual alarm during all modes of pilothouse hydraulic movement;
- Instruct operators to confirm personnel are clear of the danger zone before moving the pilothouse;
- Instruct all personnel to never position themselves under the retractable pilothouse, even temporarily;
- Clearly mark and place physical barriers around the perimeter of the pilothouse danger zone and discourage unauthorized personnel movement under the pilothouse;
- Incorporate the potential dangers, audible and visual alarms, and safety considerations about pilothouse hydraulics into the SMS; and
- Ensure new crew members receive proper safety training and that all personnel receive annual refresher training.





WORLD BORA COLLISION WITH THE RABA: DMAIB RELEASES ACCIDENT REPORT

On February 19, 2019, the Cypriot-flagged cargo ship RABA, sailing from Copenhagen to Szczecin, collided with the Danish-flagged 'World Bora', which was sailing towards the Viking wind farm in the Exclusive Economic Zone.

The master of RABA was responsible for observing the traffic onboard the vessel and did not identify any ships as a risk of collision. On the starboard side, the other vessel World Bora was seen crossing RABA's course but wasn't considered as a danger that could cause a collision. Thus, the master didn't pay closer attention. However, during his watch, he got preoccupied with other duties and lost track of time, resulting in him not following up with the crossing vessel he previously saw.

In the meantime, although the AB was conducting lookout duties, he didn't inform the master of the close quarter situation until a few minutes before the collision. It is likely that the AB did not realise the risk of collision, because he was not trained in detecting the risk of collision by means of visual bearing alone the report highlights.

The report presents the factors that are most likely to have caused the collision between the two vessels. The underlying reason why the master forgot to follow up on the traffic was his preoccupation with the activities he was engaged in while keeping navigational watch. These activities were related to his function as watchkeeping officer and master of the ship.

DMAIB comments that, based on other investigations, watchkeeping is intertwined with other tasks than navigating the ship and keeping lookout. Even though these work practises are common and normally not an issue, they became critical when the watchkeeping officers on RABA and World Bora were simultaneously in their activities when the ships were on a collision course.

Read the report in full at <https://bit.ly/2SeF6yv>

SEED CAKE GUIDELINES PUBLISHED FOR SAFE CARRIAGE IN CONTAINERS

CINS, together with the International Group of P&I Clubs, has published guidelines for the carriage of seed cake (s.c.) in containers. The practices set out in this document are intended to improve knowledge and the safety during the carriage of such cargo and to ensure that it is properly declared, packaged and carried.

In these Guidelines, seed cake includes any type of pulp, meals, cake, pellets, expellers or other cargo where oil has been removed from oil-bearing seeds, cereals or commodities with similar properties.

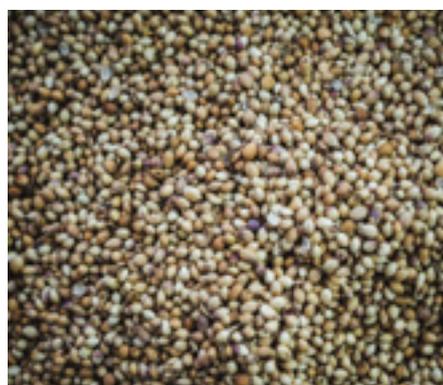
Trade names under which Seed Cake may be presented for shipment include, but are not limited to, those listed below:

- | | | |
|------------------------|---------------------------|------------------------|
| Animal feed; | Copra extraction pellets; | Groundnut meals; |
| Palm kernel expellers; | Peanut (oil) cake; | Peanut meal; |
| Seed meal, oily; | Soya bean meal; | Sunflower (seed) meal. |

The presence of oil and moisture in these cargoes can cause self-heating. Microbiological self-heating, driven by the inherent moisture content, can increase the temperature of the cargo to a point where oxidation of the residual oil occurs. This oil oxidation can cause further self-heating occurring.

While all self-heating is usually initially slow, oxidative self-heating can be much faster than microbiological heating and may raise the temperature high enough for the cargo to ignite spontaneously. As a result, the higher the moisture and oil content the higher the risk of self-heating and spontaneous ignition.

Download the pdf guidelines at <https://bit.ly/2O8fsdj>



REPORT bites

A total of 82 incidents of piracy and armed robbery against ships in Asia were reported to ReCAAP Information Sharing Centre from January to December 2019. This represents an increase of 8% (6 incidents) in the total number of incidents and an increase of 15% (9 incidents) in actual incidents, compared to 2018.

During a recent survey of the deep seafloor off Big Sur, MBARI researchers discovered thousands of mysterious holes or pits in the seafloor. Scientists and resource managers now want to understand how these pits formed because this area is the site of a proposed wind-energy farm.

German shipyard Abeking & Rasmussen has launched its 68-metre (223-foot) superyacht Soaring, after she left the shed earlier in the week. She will now be prepared for sea trials, ahead of April when she is due to be delivered.

Delivering testimony to the US House of Representatives Committee on Transportation and Infrastructure, Peter Bryn, ABB Technical Solutions Manager said, "ABB encourages the Subcommittee to set an ambitious, long-term national plan to achieve zero emissions for all vessels under its operation, as well as support the growth of the sustainable maritime industry."

A plan is being formulated to preserve one of the world's most historic and well-known vessels. The superliner Queen Mary has been permanently moored in Long Beach since its removal from transatlantic service in 1967. A 2015 survey revealed the liner has been in an escalating state of disrepair.

Ilya Espino de Marotta took office as Deputy Administrator of the Panama Canal in January, becoming the first woman to ever hold this position.

Boskalis has completed the acquisition of marine survey company Horizon, acquiring the remaining 37.5% in the Group that it did not already own.

From their base deep within a former World War II U-boat pen, Norwegian company, OceanTech, is developing a set of robot tools that cling to offshore structures in order to effect inspection, maintenance and repair.

Safety Briefings

CARGO LASHINGS INSUFFICIENT SAYS MAIB REPORT ON EUROPEAN CAUSEWAY INCIDENT

At 0633 on Tuesday 18 December 2018, the roll-on/roll-off (ro-ro) passenger ferry European Causeway rolled heavily in very rough seas and very high winds during its voyage from Larne, Northern Ireland to Cairnryan, Scotland. Insufficient cargo lashings have been found to be a key factor in the incident.

The violent motion caused several freight vehicles to shift and nine to topple over. This resulted in damage to 22 vehicles, some damaged severely. At least six freight vehicle drivers had remained in their cabs on the vehicle decks during the crossing and four were found in cabs of vehicles that had toppled over. One driver was trapped and had to be freed by the emergency services when the ship arrived in Cairnryan.

The MAIB investigation found that:

- The route being followed had not been adjusted sufficiently to mitigate the effects of the sea conditions and reduce the likelihood of severe rolling.
- The cargo lashings applied were insufficient for the forecasted weather conditions.
- The ship's approved cargo securing manual provided limited guidance to ship's staff
- Drivers remaining in their vehicles during the ferry's passage, in contravention of international regulations and company policy, was not uncommon and is an industry-wide issue.

Conclusions

- The accident occurred because European Causeway rolled heavily in rough seas and its cargo had not been adequately secured.
- The weather conditions had been forecast and the accident would almost certainly have been avoided had European Causeway's sailing been delayed until 0900 when the wind speed, as forecasted, dropped significantly.
- The night master's decision to sail in heavy weather was influenced by the decision of European Highlander's more experienced master.
- The passage plan was not altered to minimize the potential effects of the prevailing and forecast weather conditions and the night master's intent was not clearly communicated to the OOW. Either action could have avoided heavy rolling.
- The freight vehicles were not lashed in accordance with the guidance provided in the MCA's Code of Practice – 'Roll-on/Roll-off Ships – Stowage and Securing of Vehicles'.
- The ship's approved CSM and the company SMS did not provide sufficient guidance to staff about stowage techniques or the number and disposition of lashings to be applied for adverse weather conditions, and relied upon the master's experience and discretion.
- The passengers who remained in their vehicles during the passage endangered themselves and compromised the safety of other passengers and crew. This problem is not unique to P&O Ferries Ltd and requires industry-wide collaboration to eliminate it.

Read the report at <https://bit.ly/2GuxB0D>



AARON & MELISSA II: CLOGGED BILGE SYSTEM AND POOR WEATHER LED TO SINKING

The National Transportation Safety Board (NTSB) has released a Marine Accident Brief about flooding and sinking of the fishing vessel Aaron & Melissa II approximately 70 miles southeast of Portland, Maine.

The Aaron & Melissa II sank about 0800 local time on November 14, 2018. All four crewmembers abandoned ship and entered an inflatable liferaft when attempts to dewater the vessel proved unsuccessful; they were later rescued by a U.S. Coast Guard helicopter.

The NTSB determined that the probable cause of the flooding and sinking was the captain's decision not to return directly to port with forecasted gale-force conditions, combined with the clogged bilge system, which prevented the crew from dewatering the flooded lazarette.

Abandoning Ship

With the vessel listing to starboard and no ability to dewater the flooded lazarette, fish hold and lobster tanks, the three crewmembers donned their survival suits and went to the port bow where they awaited the order to abandon ship.

After determining the vessel could not be saved, the captain joined the crew on the bow. The engineer then inflated the liferaft. All four crewmembers jumped into the water and boarded the raft, abandoning the vessel just as it began to sink beneath the waves, stern first. The liferaft painter became entangled on the sinking vessel's mast. Fearing they would be trapped inside the raft and pulled down with the vessel, the crew left the raft and entered the sea.

Read the full report at <https://bit.ly/2GCX2x4>

HSE TO CARRY OUT WELDING INSPECTIONS

HSE IS reminding employers that they must protect their workers' health by controlling the risks from welding fumes.

The Health and Safety Executive's (HSE) current programme of inspections will review health and safety standards across the country and businesses are encouraged to visit HSE's revised guidance to remind themselves of the changes to control expectations.

To protect your workers' health, you must ensure you have adequate controls in place to avoid or reduce exposure to welding fumes. Employers should be using local exhaust ventilation where effective and provide suitable respiratory protective equipment where necessary to protect workers in the metal fabrication industry from inhaling fumes.



The inspections follow a safety alert that was issued in February, 2019 after new evidence showed exposure to mild steel welding fume can cause cancer and HSE updated guidance to reflect that.

Scientific evidence from the International Agency for Research on Cancer shows that exposure to mild steel welding fume can cause lung cancer and possibly kidney cancer in humans.

John Rowe, Head of Manufacturing at HSE said: *"Employers and workers should know the risk, plan their work and use the right controls when welding activity is carried out. If they are not HSE will use enforcement to bring about improvements. It is our mission that all workers are protected and are not made ill or killed by their work. Everyone should be able to leave work and go home healthy and safe."*

RECENT NEW IIMS MEMBERS

Full members

Howard Roberts	<i>MIIMS</i>	UK
Jamil Vanterpool	<i>MIIMS</i>	BVI
Jason Lee	<i>MIIMS</i>	South Korea
Rajendran Sellamuthu	<i>MIIMS</i>	India
Daniel Dore	<i>MIIMS</i>	Nigeria
Tony Dale	<i>MIIMS (Upgrade)</i>	UK

Associate members

Fahad Ansari	<i>AssocIIMS</i>	UAE
Tufan Tunali	<i>AssocIIMS</i>	Turkey
Taj Mohamad Hussain	<i>AssocIIMS</i>	India
Harold Gordon	<i>AssocIIMS (Upgrade)</i>	Canada

Corporate Supporting members

Norman Stewart & Co PVT Ltd	<i>CorpSuppIIMS</i>	India
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Affiliate members

Mike Harris	<i>AffIIIMS</i>	UK
Vincent Cook	<i>AffIIIMS</i>	UK
Jonathan Spiller	<i>AffIIIMS</i>	UK

Graduate members

Murray Kirzinger	<i>GradIIMS</i>	Canada
Francis Kelly	<i>GradIIMS</i>	Ireland
Juncie Macawili	<i>GradIIMS</i>	Italy

IIMS congratulates those students who have completed their studies:

IIMS Professional Qualification in Commercial Ship Marine Surveying - Juncie Macawili

IIMS Professional Qualification in Yacht and Small Craft Marine Surveying - Murray Kirzinger and Francis Kelly

NEW MEMBER BENEFIT

SYVR matchmaking platform and the International Institute of Marine Surveying announce joint initiative

After many months of discussion, SYVR, the first open worldwide matchmaking platform between clients and marine surveyors and the International Institute of Marine Surveying (IIMS), the leading global professional body for marine surveyors, have announced a joint working initiative.

The two organisations in parallel have been pushing technological boundaries for the marine surveying industry over the past two years. Both organisations are driven by the desire to increase marine surveying standards and to ensure that only those surveyors who have appropriate skills are engaged by clients to carry out surveys, meaning transparency for all. The smart SYVR App, launched in 2018, uses algorithms to assess a surveyor's experience and specialism, then matches them to the client's requirements when a request for survey is made. Over the same period IIMS has launched three Apps, including the Marine Surveyor Search App.

How SYVR automated application works:

- The marine surveyor creates an account at no cost and submits their CV with their areas of specialism via the online portal
- A basic company registration/CVR/name and compliance check is performed
- The CV, education and professional experience are broken down
- SYVR AI automatically calculates the marine surveyor's seniority and experience from level 1-5

Originally launched with the commercial ship surveying sector firmly in mind, as part of this joint initiative, IIMS has scoped out key small craft specialisms which have been added to the SYVR platform and algorithm. IIMS will promote and recommend the SYVR platform to its members with the aim of further populating the platform. Additionally, those who decide to join the programme will be recognised with the IIMS logo on their listing to show they are a member of one of marine surveying's most prestigious membership organisations. SYVR launched its first version in June 2018 and handled its first online instruction the month after.

Henrik Uth, SYVR Managing Director said, "By entering into this joint initiative, SYVR is confident it can increase its reach and penetration in the marine surveying sector. Our technology and matching process is working effectively. This initiative will allow us to take things to the next stage."

IIMS Chief Executive Officer, Mike Schwarz, commented, "IIMS is delighted to be working with SYVR. As I have got to know Henrik in the past 18 months, it is clear that we share a common goal to drive up standards across the marine surveying sector. The coming together of two likeminded organisations that share a common goal is exciting, beneficial to both, to instructing clients and marine surveyors."



MISREPRESENTATION BY AN AMSA ACCREDITED MARINE SURVEYOR

It has recently been brought to the attention of IIMS by the Australian Maritime Safety Authority (AMSA) that an AMSA Accredited Marine Surveyor may have made representation to the operator of foreign vessels to assist in preparing vessels for port State control (PSC) inspection.

While this representation was made to the operator of a foreign vessel, it is possible that such representations could also be directed to the operators of Regulated Australian Vessels (RAVs) to assist them with preparing for a flag State control (FSC) inspection.



Australian Government
Australian Maritime Safety Authority

It is important to note that AMSA only accredits marine surveyors to carry out surveys of Australian Domestic Commercial Vessels (DCVs) under the National Law.

While AMSA accepts that some Accredited Marine Surveyors may have the appropriate training, qualifications and experience to assist the operator of a vessel with preparing for a PSC or FSC inspection, it would be misleading for that surveyor to make representations that they are accredited by AMSA to do so. Similarly, it would be misleading for such a surveyor to allow a vessel operator to assume that the surveyor's AMSA accreditation was with respect to the survey or inspection of RAVs or foreign vessels.

AMSA plans to inform all AMSA Accredited Marine Surveyors of the inappropriateness of this type of misleading practice, and of the fact that future instances of this type of behaviour will be referred to the Australian Competition and Consumer Commission (ACCC) for investigation.

IIMS is pleased to endorse AMSA's message and it acts as a timely reminder to be aware of the various codes of conducts and ethics by which marine surveyors are bound by.

ENHANCEMENT TO THE IIMS WEBSITE SURVEYOR SEARCH

The way a member's listing appears on the IIMS website has changed and looks rather different too. Working in conjunction with our partners at eDot Solutions, it is slicker, cleaner and easier for the user to navigate around and has a friendlier search. There are some comprehensive help screens to guide users through the process too - see <https://bit.ly/36ZwNfO>.

Those who find a listing of interest can now email the surveyor directly (as before) or click a button to reveal their telephone number. A number of filter options have been added, so the user may drill down easily to find the surveyor by location or by specialism. It is important, therefore, that you check your listing (if appropriate) for its accuracy as the Institute cannot guarantee everything has been transferred successfully. If something is incorrect, please email: membership@iims.org.uk.

The new IIMS membership database now powers both the Marine Surveyor Search App (available for iOS and Android appliances) and the web-based version that site users will see. Effectively we have backed the App search technology into the website.

The site user does not need to be registered or to have downloaded the App to find and contact a surveyor. However, registration will be encouraged and brings with it other functionality. The map search is dynamic. Additionally, a member may now show the nearest port (and other ports), harbours or marinas where he/she is happy to work from. This is a new feature and one we cannot second guess. So, if for example you are a small craft surveyor and want to list several local marinas that you operate in, you can do so, but you will need to tell us - or follow the instructions in the next paragraph.

There is second part to this initiative which is linked and IIMS will be writing to members by email soon with full details. With immediate effect a member surveyor will be able to use their regular login details to manage aspects of their website listing. That means once you have checked your listing and found that you have developed a new specialism missing from your listing, you can request it. However, you will need to provide suitable evidence of your skill to satisfy the Professional Assessment Committee before it is granted. More details coming soon.



YOUR INSTITUTE IS NOW PART OF THE PAPERLESS SOCIETY!

Finally, IIMS can announce it has gone paperless. The creation of the ICD (IIMS Central Database) using the Zoho Creator platform has taken a couple of years to develop, test and implement. But the results are pleasing and significant to see.

Our accounting function went paperless a while back with the introduction of Xero a couple of years ago. The Education department and Professional Qualifications followed next. The Certifying Authority MCA coding was more complex; and finally, the entire membership is stored and managed online using the ICD.



As the team has got to grips with the changes, it has meant learning a series of new skills, but we've done it!

IF GDPR AFFECTS YOU, HOW WELL DO YOU COMPLY WITH DATA PROTECTION LAW?

Recently a small craft surveyor wrote to IIMS advising he had received an official looking letter from ICO (Information Commissioner's Office). Thinking it might be a scam to extort money, he referred back to the Institute. The letter is indeed official, requesting a response and payment within 28 day. There is a requirement by law if you hold third party client or customer data electronically to register with ICO and pay a small annual fee to show compliance with the regulations. Failure to do so can lead to a fine of up to £4,000. And if you do not need to pay, you are required to file a nil return to inform ICO you are exempt.

Here is an extract from the letter (with certain parts redacted).

"I'm writing from the Information Commissioner's Office (ICO), the UK's data protection regulator. Our records show that you are not registered with us. Registering as a fee payer shows your customers that you take your data protection obligations seriously and [YOUR BUSINESS] will be listed alongside the other companies in the manufacturing industry who pay their fee.

The Data Protection (Charges and Information) Regulations 2018 require every business that processes personal information to pay a data protection fee to the ICO, unless they're exempt. If you need to pay and don't - you could be fined up to £4,000.



If you hold customers' names, addresses or phone numbers on computer, you're processing personal information and may need to pay.

Most companies need to pay £40 or £60 a year. There aren't many situations where you'd be exempt from paying a fee. If our online fee checker says you don't need to pay, please let us know by filling in the short form at ico.org.uk/no-fee, and we'll update our records.

There's no need to call us as well as completing the form, but we do have a helpline number in case you need it: **0303 123 1113**."

The General Data Protection Regulations formally came into force in May 2018. It is a complex piece of regulation to understand. More information on whether you are liable to pay or not as a sole trader or small business can be found at <https://ico.org.uk/for-organisations/data-protection-fee/self-assessment/> - do the self assessment check.

If you receive such a letter from ICO you are urged not to ignore it!

NOBLE MARINE INSURANCE 'NEXT GEN' WEB SITE SURVEYOR DATABASE TO BE POWERED BY IIMS

Noble Marine is a privately owned, independent, busy insurance broker specialising in marine insurance, based in Newark UK. Originally formed in 1989 to concentrate solely on the needs of private marine customers, the business has established a reputation for high quality products and service. Throughout their history they have been enthusiastic supporters of competitive sailing and Noble Marine is the preferred insurance provider for many class associations, boat and yacht manufacturers.

The Noble Marine web site is busy, boasting high google rankings and being well found in organic and paid web searches by those looking for boat and yacht insurance. The web site currently presents a rather out of date, old fashioned looking, searchable database of marine surveyors.



Noble Marine is in the process of developing a new web site presence, soon to be launched. Consequently, IIMS has entered into an exclusive agreement to supply a list of current IIMS yacht and small craft members in the UK and Europe to Noble Marine on a quarterly basis, all of whom will feature on their new web platform once launched. So, if you are a practising member operating in those parameters, expect to find yourself listed there soon.



WHAT PRICE EXPERT WITNESS WORK?

Recently an expert witness in a field unrelated to marine surveying fell foul of the court, but what happened to him should serve as a warning to anyone providing expert witness of the potential pitfalls. In his case, it cost him the not insignificant sum of £89k to cover the costs wasted as a result of his input.

The recent article, published in The Law Society Gazette stated: "Sitting at Manchester County Court, Her Honour Judge Claire Evans took the unusual step of punishing consultant spinal surgeon Firas Jamil after hearing he was 'not generally competent as an expert' and not fit to be giving evidence.

The defendant in Thimmaya v Lancashire NHS Foundation Trust sought the wasted costs order after Jamil was 'wholly unable' to articulate the test applied in determining breach of duty in a clinical negligence case. In the end, the consultant stated he did not know the test had to be applied, and the claimant had no choice but to discontinue her claim.

The judge added: 'Whilst it would not be right to use him as an example to send a message to experts, it is right that experts should all understand the importance of their duties to the court and the potential consequences if they fail in them.

Evans noted there are 'plenty of not very good experts around' and cases where an expert gives an opinion where they lack relevant experience, but not all these experts should find themselves liable to pay wasted costs."

IIMS urges its members to think carefully before agreeing to undertake expert witness duties.



IIMS CANADA BRANCH VANCOUVER CONFERENCE 6-7 MARCH 2020

Day 1 Friday 6th March

- 0800 Opening and welcome presentation by Mike Schwarz leading into a 30 minute review of IIMS, the member benefits and current HQ initiatives
- 0830 Standards and the Marine Surveying Practitioner Scheme by Mike Schwarz
- 0915 Multiple Echo Thickness Measurements and GRP Inspections by Jon Sharland (live by video link)
- 1015 Design and Construction of a Quadruple Screw Shallow Draft Truckable River Tug by Jonathan Naude, Capilano Maritime Design Naval Architects
- 1130 InspectX, Survey Report Writing Software by Craig Norton
- 1300 Protecting Boats with the Latest Technology by Sean Battistoni, Barnacle Monitoring systems
- 1430 Errors & Omissions Insurance for Surveyors and Limiting your Liability by John King, Senior Vice President Commercial Risk Solutions, Aon Reed Stenhouse Inc.
- 1530 Common Marine Electrical Deficiencies to Look For in Small Craft by Jeff Cote, Systems Design Engineer, Pacific Yacht Systems

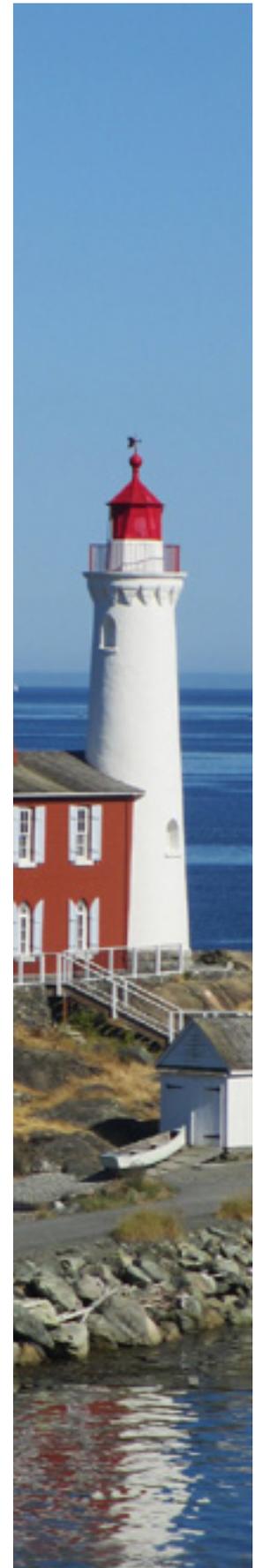
Day 2 Saturday 7th March

- 0800 Opening remarks by Ed O'Connor, IIMS Canada Branch Regional Director
- 0815 Atmospheric Hazards and Protecting the Marine Surveyor by Capt John M. Malool
- 1000 Introduction to IMO and Port State Control by Said Nassif, Canadian International Bureau of Shipping Ltd
- 1100 ISO and Cybersecurity by Dennis Cunanan, CISM, C|CISO President/Owner at Corporate Prime Solutions Inc.
- 1230 Lithium battery technology by Jerry Makarawicz and Huxley Witts, Britmar Power.
- 1415 Environmental compliance monitoring and surveys by Oscar Hopps, Dive Operations Manager Enviro-Tech Diving Inc.
- 1515 Non technical tips and advice for writing an effective report by Mike Schwarz
- 1600 Closing speech and remarks by Ed O Connor.

IIMS, SAMS, NAMS and other industry professionals are welcome to participate. CPD points are awarded to all IIMS members who attend – non IIMS members please check with your organisation's policy for CE's or CPD's.

The cost for attendance on BOTH days is CA\$240 and includes lunch plus the cocktail party and dinner. Given how tight we are to the event itself now, why not consider joining as an online only delegate for CA\$200 for BOTH days.

To reserve your place please go to <https://bit.ly/2SxINAC>.



REPORT ON THE IIMS BALTIMORE 2020 CONFERENCE

Held in late January in Baltimore, the Maritime Institute (MITAGS) once again played host to IIMS for its annual conference visit to the US. The conference has grown in popularity and this one, the first marine surveying conference of the new decade, was the largest so far attracting forty plus delegates, most of whom joined in a real time capacity.



James Renn FIIMS had arranged a first class line up of speakers who presented on a wide range of topics, much appreciated by those who participated. Videos of much of the two days' content can be found on the IIMS YouTube channel and is freely available.

Having welcomed delegates, James handed over to Mike Schwarz, IIMC CEO, who gave an overview of the main activities of the Institute. He gave way to Van Macomb, who delivered a succinct presentation on surface

coatings for non-skid surfaces. James came back to the podium to continue the theme as he talked about measuring slip resistance in non-skid surfaces.



Following a break, George Hunter from Coltraco joined the meeting and gave his presentation live from London. In it he introduced the latest developments in ultrasound measurements of storage tanks, fire suppression equipment and the like. Next up, Capt Todd Taylor talked about the not insignificant challenges of carrying out surveys for donation and charitable purposes.



First to speak after lunch was Michael Pinto, something of an expert in the area of mold (US spelling of mould). He delivered a compelling presentation and left those present in no doubt that mold in the

marine environment poses a health threat. IIMS has invited Michael to write a more detailed article on this topic, which will appear in the March Report Magazine.



New technology was an ever-present theme during the Conference, none more so than the presentation and live demonstration by Bartosz Dagnowski, the man who invented and patented laser cleaning. Those who witnessed the live demonstration were astonished at the ease which items could be easily laser cleaned. This technology could have many practical uses in the marine sector.



Capt Bill Ackley brought the first day to a close when he reminded everyone of the danger they face each and every day in the course of



their work. Bill spoke about the practices and regulations for safety in the workplace.

Day two dawned on an upbeat note. Mike Schwarz gave a short presentation on the progress towards the launch of the Marine Surveying Practitioner accreditation scheme. Dennis David followed him to the stand and picked up the mold topic from the previous day when he spoke about the tools available to detect mold, both visible and invisible.

Capt Bill Weyant and Bob Kissinger tackled the thorny subject of ethical standards for surveyors. In a double handed presentation, which include a bit of role play, they presented ten scenarios in a 'good cop bad cop' style. It served as a reminder to all present to take their ethical responsibilities seriously.



Following a break, the audience were treated to a video of Ian Nicolson, filmed in Scotland in 2019, talking about his experiences as a surveyor over the past 75 years. Following on came James

Sweeney, who kept the theme of environmental health issues in the spotlight. His topic was an overview of bio security and infection control. He finished his slot with a live demo to demonstration the power of using filters to protect the environment.



Former US Coastguard, George Zeitler, shared his extensive knowledge on the subject of environmental surveys, running delegates through some of the MARPOL regulations relevant in this area.



After a wonderful visit to the ship simulator on campus, one of the finest of its kind in the world, Todd Lochner opened the final afternoon session. A forthright Attorney, specialising in maritime law, Todd expressed some strong and valuable opinions. The aim of his talk was to remind surveyors of who they (and their reports) are responsible to. Conference was brought to a close by the enigmatic Capt Lloyd Griffin. The title of his presentation was, "What we see and cannot believe – you just can't make this up. In a fast-flowing presentation, Lloyd presented a number of photos showing non-compliance and explained the consequences of them, many of which were potentially lethal and likely to lead to injury. A compelling presentation, it acted as a reminder to all surveyors to be vigilant and to report accurately and factually.



James Renn said, "I am grateful to those who spoke and who were prepared to share their knowledge with us all for the greater good. That so many of you have travelled so far to be a part of the IIMS Baltimore Conference is truly heart-warming and I thank you all."

Mike Schwarz commented, "It is always a pleasure to be present to support James in Baltimore. This was an exceptional Conference, well-staged and showcasing some great speakers and superb content."

Review of the decade: 2010-2019

Events that shaped IIMS, the ship and boating world in the 2010s

As we welcomed in 2020 - a new decade – just a couple of months ago with renewed hope and optimism for the marine world and surveying profession in particular, The Report Magazine takes a whistle stop tour back into the 2010s. We review some of the things that shaped not only our profession and institute, but also the shipping and boating world using the Report Magazine’s archives as the initial resource.

The year 2010

At the start of 2010, IIMS published a Strategic Plan for the five years up to 2015. Many of the objectives have been met with the addition of new membership benefits, more education, training, conferences and enhanced international recognition.

That year, the Deepwater Horizon accident was as brutal as they come. In April 2010, while drilling at

the Macondo Prospect, a blowout caused an explosion on the rig that killed 11 crewmen and ignited a fireball visible from 40 miles (64 km) away. The fire was inextinguishable and after two days the Horizon sank, leaving the well gushing at the seabed and causing the largest oil spill to ever occur in US waters.

In May 2010, the late Tony McGrail FIIMS penned an article for the Report Magazine about the varying standards of report writing amongst yacht and small craft surveyors. He questioned the overall quality, referring to some he had seen as ‘downright incompetent’. Ten years on the quality of report writing

continues to vary and remains a deep source of concern for the industry and something IIMS continues to grapple with and train surveyors on.

Peter Morgan took up the post of IIMS President in 2010, succeeding Capt Allen Brink.

The IIMS India Branch was formed in 2010 during a two-day conference that took place at The Ramada Hotel, Powl, Mumbai.

In association with STET, IIMS arranged a successful and well attended conference held in Singapore.



The year 2011

Fast forward one year to 2011 which saw the opening of the IIMS Australia Branch headed up by Adam Brancher (Chairman) and Capt Peter Lambert (Regional Director). Sadly, the branch was not set to see the decade out.

The first major ferry disaster of the decade occurred on 10th September 2011 when MV Spice Islander I, a passenger ferry carrying over 2,000 passengers, sank off the coast of Zanzibar. The ferry was travelling between Unguja and Pemba when it capsized. Early estimates put the death toll at around 200, but a report published by the Tanzanian government in January 2012 claimed that over 1,500 people had perished.

On 13th January 2012, Costa Concordia struck a rock in the Tyrrhenian Sea just off the eastern shore of Isola del Giglio. This tore open a 50 metre gash on the port side of her hull, which soon flooded parts of the engine room, cutting power from the engines and ship services. With water flooding in and the ship listing, she drifted back towards the island and grounded near shore, then rolled onto her starboard side. The evacuation took over six hours and of the 3,229 passengers and 1,023 crew known to have been aboard, 32 died - an accident that should never have occurred. Nick Sloane HonFIIMS led the group that was instrumental in righting and salvaging the vessel, a precision assignment that took months of planning and work to complete successfully.

Capt Satish Anand took up the Institute's Presidency in 2012 and hosted a successful event in December that year in Chennai titled 'Professionalism, Training and Education'.



The year 2012



The year 2013

The Report Magazine published an article in May 2013 by William Kremer who posed the question "How much bigger can container ships get?" He wrote the article as the Triple E Class vessels, capable of carrying 18,000 TEU, came on-stream. Seven years later we know the answer - much bigger!

Two of the industry's heavyweights became one with the formation of the DNV GL Group, which became operational on 12th September 2013 after the merger of DNV and GL.

Late in 2013, the IIMS UAE Branch ran an eventful conference at Dubai Marine, Beach Resort & Spa entitled 'Marine, Offshore Insurance and Claims'.

Early 2013 saw IIMS working with Wood Group Integrity Management (as it was then) to launch a new standard for those involved in inspecting subsea thermal insulation systems called the International Registered Marine Insulation Inspector scheme. Peter Morgan led the early development of the programme and despite the oil and gas downturn in the mid-2010s (which saw the scheme hibernate) it is making a welcome return now in the 2020s.

The December 2013 Report Magazine carried two fascinating articles. Capt Andy Cross, (Past IIMS President), had completed 10,000 miles at the time of publication aboard Invest Africa as part of the Clipper Round the World Race series. As he said, "Only another 30,000 miles to go - not bad for an old fart like me at 66." That same issue carried a report written by Capt Peter Lambert and Milind Tambe following the Institute's ground-breaking visit to the shipbreaking yards of Alang in India.



The year 2014

Mike Schwarz joined IIMS in January 2014 as Chief Executive Officer replacing John Lawrence, who retired.

On the morning of 16th April, the Sewol ferry sank off Jindo, South Korea with 476 people on board, including 325 high school students on a field trip. The disaster killed more than 300 people. In November 2014, the captain was sentenced to 36 years in prison for abandoning the sinking ship with passengers trapped inside. The owner of the company operating the ferry was found dead in a field shortly after the disaster.

The Cheeki Rafiki was a tragic accident that took place in May 2014. She left Antigua on 4th May with a crew of four men on board.

The voyage was expected to take about 30 days. During the voyage, the skipper exchanged emails with the director of Stormforce over satellite phone, especially about route suggestions and weather reports. Initially, there was not much wind, but it was constantly increasing and on 16th May, the wind blew with Force 7 and a considerable sea had built up. The skipper reported to shore that the ship was taking on significant amounts of water for no apparent reason. A later phone call was incomprehensible. A search-and-rescue operation was started. RCC Boston, responsible for the area in question, sent out a HC-130 Long Range Surveillance Aircraft. They were looking for a disabled yacht and persons in the water, since two PLB devices had sent emergency signals. The aircraft crew identified only debris at the expected position and tragically the bodies were never recovered.

French based, Capt Bertrand Apperry, became the thirteenth IIMS President in June 2014.

The UK formally adopted MLC 2006 on 7th August 2014.

In 2014, the International Maritime Organization adopted the historic International Code for Ships Operating in Polar Waters, or Polar Code for short, establishing for the first time a mandatory set of rules covering “the full range of design, construction, equipment, operational, training, search and rescue, and environmental protection measures” specific to ships operating in harsh Arctic and Antarctic waters.

The Institute’s wholly owned subsidiary, the Marine Surveying Academy (MSA), was born in 2014 with the goal of becoming the third-party training arm of the business. As well as the IRMII standard, MSA launched the Registered Marine Coatings Inspectors qualification for those involved in inspecting superyacht coating systems and piloted the first course in September 2014. Over 100 have qualified since and the scheme has made a real difference in this niche industry sector.

Late that year, Adam Brancher spoke exclusively to The Report Magazine with an overview of the soon to be launched AMSA Domestic Commercial Accreditation scheme.



The year 2015

In the spring of 2015, IIMS and MSA announced they had won a contract to deliver an accreditation scheme for IMCA in the offshore inspection sector. The eCMID Accredited Vessel Inspector scheme was conceived. The scheme, now successful, boasts around 500 accredited inspectors, all of whom have had to meet the strict assessment criteria. This initiative has gone a long way to cleaning up the once unregulated offshore inspection sector and continues to flourish.

London Shipping Week opened its doors for the first time in September 2015 and proved to be an instant hit.

In the summer of 2015, IIMS announced the publication of its first four handy guides. The ‘What a marine surveyor needs to know’ series has grown and there are now twenty-one guides in the collection covering everything from report writing to surveying sails.

The Marine Insurance Act was a clear and well written Act back in 1906 and many felt the need for change was unnecessary. However, the Insurance Act came into force on the 12th August 2015.

El Faro departed Jacksonville, Florida on 29th September when Tropical Storm Joaquin was several hundred miles to the east. Two days later, after Joaquin had become a Category 3 hurricane and the vessel likely encountered swells of 20 to 40 feet as it sailed near the storm’s eye. The ship had taken on water and was listing 15 degrees. The last report from the captain, however, indicated that the crew had contained the flooding. But on 2nd October the ship was declared missing, thus resulting in one of the worst shipping tragedies in US history.

IIMS UAE Branch presented their biennial conference in Dubai entitled ‘Marine Loss Prevention & Warranty’. Following the parting of the ways with awarding body edexcel, IIMS decided to launch its own Professional Qualification in Yacht & Small Craft Surveying and Commercial Ship Surveying. The education programme continues to attract around 100 new students each year and is highly regarded for its form and content.



IIMS reached the grand old age of twenty-five and prepared to celebrate its silver jubilee in June that year with a Gala Dinner, Conference and Awards Ceremony in London. Guest of Honour, Maritime & Coastguard Agency CEO at that time, Sir Alan Massey, presented a host of Awards for Excellence to deserving IIMS members. Capt William MacDonald, the founding father of the Institute,

had been tracked down and was the special guest at the Gala dinner when he was recognized with an award and invited to cut the celebratory cake! The Conference in the Old Library at Lloyd's was well attended. Adam Brancher took up the post of President.

IIMS Canada Branch was born in 2016 following the merging of the Association of Marine Surveyors British Columbia into the Institute.

On 31st May, the IIMS Nigeria Branch was official inaugurated.

The Panama Canal expansion project, also known as the Third Set of Locks Project, doubled the capacity of the Panama Canal by adding a new lane of traffic allowing for a larger number of ships, and increasing the width and depth of the lanes and locks allowing larger ships to pass. The expanded canal began commercial operation on 26th June 2016.

The Report Magazine June 2016 featured an article by Gary Vasconcellos, a member based in

Vanuatu, following the destructive Cyclone Pam which wreaked havoc in the area. His photographs of small boats and yachts in ruins were mesmerizing and a powerful reminder of the dangers the weather can pose to those at sea as well as on land. Also, in that issue, Rolls Royce wrote about their vision for autonomous shipping controlled from a land-based command centre.

New enclosed space mandatory regulations came into force during 2016, but given the number who continue to die in such spaces, one must question how successful they have been. Such incidents, many of them avoidable, remain a stain on the industry.

An article in the September Report Magazine by Susan Stockwell highlighted the dangers of carbon monoxide afloat, or the silent killer as it is known, which has claimed many lives in recent years. Marine surveyors are reminded to remain vigilant.

IIMS India Branch ran its biennial conference in Mumbai drawing an audience of 100. The event was entitled 'Marine Surveying Preparing for 2030'.



The IMO's Polar Code came into effect.

January 2017 saw the launch of the first IIMS App, developed by eDOT solutions in Goa, India. The Continuing Professional Development App is a simple way for members to keep their CPD activities and points in order. The App is routinely used by many members.

After many years as IIMS Membership Administrator, Jan Cox stepped down and headed into retirement.

That year's London Conference was memorable for the dinner, which took place deep beneath the streets of central London at the Cabinet War Rooms.

The September edition of the Report Magazine published a detailed, special feature on the wind and renewable energy sector, starting to burgeon in the UK at that time. As well as assessing the opportunities for surveyors, the article highlighted a range of opinions about the growth of crew transfer vessels and their inspection/survey regime.

The IIMS Professional Qualifications education programme was recognized by the International Maritime Club and awarded a Golden Shield Excellence Award at a ceremony held at the Old Library at Lloyd's of London.

IIMS experimented successfully delivering online training to surveyors across the world using the Zoom platform. This style of training and online seminar is commonplace within the Institute now.



The year 2018

IMO spoke exclusively to The Report Magazine in March 2018 as it celebrated its seventieth birthday. That same issue saw the publication of a feature entitled 'What's a yacht and small craft marine surveyor worth?' In it, Mike Schwarz urged surveyors to understand their worth as a professional and to charge accordingly.

The IIMS Inland Waterways Working Group was formed with the aim of meeting twice each year in the UK.

The IMO Sulphur Cap debate started to rage and gain momentum as the industry shuddered under the expected changing responsibilities. Regular articles on the topic appeared.

Capt Zarir Irani takes up the role of IIMS President succeeding Adam Brancher.

The first 24-hour, online marathon Marine Surveying International Fest was conceived and delivered to surveyors around the world.



The year 2019

The start of the year ushered in the new Red Ensign Group Yacht Code.

Sadly, early 2019 also brought a succession of high-profile disasters at sea causing 'hardened' shipping journalists and experts to ask what on earth had gone wrong. The MSC Zoe incident, the Yantian Express Fire, the catastrophic transfer of cargo between Candy and Maestro in the Black Sea resulting in a devastating fire and many fatalities are just a few examples.

Hugo du Plessis HonMIIMS, who authored one of the first books on fibreglass boat construction in the 1960's, passed away. His book, *Fibreglass Boats*, is still in print and available to purchase even to this day and is still regarded as a fine piece of work.

Capt John Noble stood down after many years as a management board member and *Chairman of Administration*.

March saw the Institute launch the innovative *Marine Surveyor Search App*, which is starting to gain real traction in the sector.

The *Marine Surveyor Trailblazer Apprenticeship scheme*, which IIMS played a leading role in shaping and developing, received approval and UK government funding.

IIMS began its quest to purchase the freehold of Murrills House from its landlord as the Institute's permanent home. The June Report Magazine featured a series of articles about the extraordinary history of this 500-year-old, former manor and farmhouse.

The UAE Branch celebrated its tenth anniversary since formation at a lavish 6th biennial conference in November aboard the famous QEII ship in Dubai.

The United Kingdom has become one of the best locations for wind power in the world and is considered to be the best in Europe. In 2016, wind power first surpassed coal in UK electricity generation. Wind power contributed 18% of UK electricity generation in 2018 and in the first quarter that year surpassed nuclear power generation for the first time. Wind power delivers a growing percentage of the electricity of the United Kingdom

and by the end of December 2019, it consisted of 10,267 wind turbines with a total installed capacity of over 22 gigawatts - 13,532 megawatts of onshore capacity and 8,483 megawatts of offshore capacity.

And just before confining the 2010s to memory for good, away from the surveying and shipping world, this lot was still unheard of - Apple iPad tablets; Uber taxis; Snapchat; Facetime; The Selfie Stick; Amazon Alexa; Fitbits; 4G data networks; YouTube Blogger; Restaurant deliveries and Driverless cars. And neither did these job titles exist - Cryptocurrency Manager, Internet Influencer, Data Scientist, Drone Pilot and Podcast Producer!

Well looking back what a decade it was. So much change and innovation yet overshadowed by some of the worst tragedies at sea imaginable. Never forget those who sacrificed their lives at sea in the 2010s in pursuit of their livelihood or for pleasure. How will things look one wonders when we cast our eyes back in ten years' time to review the 'roaring twenties'?

Article writer: Mike Schwarz





Behind the scenes of the

Patriona MacDonald
FOUNDATION



and its founder, Capt. William MacDonald

If the name Capt. William MacDonald sounds familiar, it should do, for he was one of those with the vision and tenacity to get IIMS started nearly thirty years ago. Capt. Bill, to those who know him, was the first President of the International Institute of Marine Surveying (1991-1993). He was one of the visionaries and founding fathers of the Institute who fought hard to get the organisation off the ground, despite fierce opposition from some quarters.

Back in 2016, the Report Magazine tracked down Capt. Bill when the Institute celebrated its Silver Jubilee. When asked about his motivation to set up an organisation for marine surveyors then, he said, "At that time back in 1991 it was not at all uncommon to find oneself working alongside Marine Surveyors who were totally unqualified and inexperienced. Their only motivation was to accept employment on a part time, ad hoc basis, simply to supplement their incomes provided by their day jobs, such as taxi drivers, restaurant staff and other professions completely unrelated to the marine world."





their lives with any hope of a decent quality of life.

The Nuns were doing their utmost to keep up with this sad situation, all be it they were struggling. The founder of this charity, Capt. Bill MacDonald, came across the orphanage with a colleague whilst visiting the area, and much to his upset saw the distress and hardship the Nuns were facing. On that day Capt. Bill made a commitment to set up a foundation in the name of his late mother Catriona Macdonald and to support the Nuns in improving the children's quality of life.

With the support from friends, business colleagues and lots of dedicated help over the past few years the situation today has changed dramatically, and the orphanage is a much-loved home and school. It now has a fully functioning water irrigation system, a working farm to encourage the healthy promotion of sustenance

and healthy living - (Capt. Bill calls it his little South American Croft) - fully equipped classrooms with access to learning materials, including a library and computer area vital to the importance of giving the children an opportunity for a better future in developing their learning skills.

The education side of the orphanage has superseded all expectations and now provides additional day care programme for local families, which aids parents who are able to work with a lifeline to provide for their families.

2019 saw the development of a much-needed sports area which allows the children to have physical education as part of their daily lives (especially the football training sessions) in a safe, happy environment.

For more details see: www.catrionamacdonaldfoundation.com

He added, "We observed that these men would frequently simply leave their leave full time occupation, rush to the vessel, fill in pre-prepared questionnaires and take a few photographs."

Time has moved on and the Report Magazine once again caught up with Capt. Bill to learn more about his personal and very direct involvement in the Catriona MacDonald Foundation in South America.

The words have been provided by Elaine Moore who picks up the story. Eight years ago, amongst the beautiful South American Rainforest, five Catholic Nuns worked tirelessly around the clock to provide a safe place for approximately one hundred homeless, abandoned children.

Orphaned children in Latin America is an ever-growing tragedy and these children face extreme poverty, violence and abuse. In an area often associated with the highest crime and malnutrition rates in the world, none of the children in the orphanage started



INNOVATION

Boyan Slat is one to watch in the 2020s

This industry needs more young entrants with an entrepreneurial streak such as Boyan Slat's. It is for his vision and entrepreneurial spirit that IIMS has marked Boyan Slat out as one to watch in the 2020s.

Boyan Slat, CEO of The Ocean Cleanup, the Dutch non-profit organization developing advanced technologies to rid the world's oceans of plastic, late last year unveiled his invention to prevent the unrelenting flow of plastic pollution into the world's oceans. The Interceptor™, under development by Boyan Slat's The Ocean Cleanup since 2015, complements the organization's founding mission by attacking the flow of plastic garbage at its source, the world's vast network of rivers.

"To truly rid the oceans of plastic, we need to both clean up the legacy and close the tap, preventing more plastic from reaching the oceans in the first place. Combining our ocean cleanup technology with the

Interceptor™, the solutions now exist to address both sides of the equation," said Boyan Slat.

The Interceptor™ is the first scalable solution to intercept river plastic pollution and can be deployed around the world. It is capable of extracting 50,000 kg of trash per day – even reaching 100,000 kg per day under optimized conditions.

Four Interceptors™ have been built to-date; two systems are already operational in Jakarta (Indonesia) and Klang (Malaysia). A third system is in Vietnam to be installed in Can Tho in the Mekong Delta (Vietnam), while the fourth is destined to be deployed in Santo Domingo (Dominican Republic). In addition to these locations, Thailand has signed up

to deploy an Interceptor™ near Bangkok, and further agreements are nearing completion including one in LA County (USA), kick-starting the scale-up.

A scalable and affordable solution to address a global problem

As part of The Ocean Cleanup's research to map the problem, it was established that 1,000 of the world's 100,000 rivers (1%) are responsible for roughly 80 percent of the garbage entering the oceans – yes Pareto's 80/20 principle is alive and thriving still, although even more extreme in this example! The product of their global scientific measurement and modeling efforts has been visualized in an interactive map that is accessible here.



The Ocean Cleanup Interceptor™ is environmentally friendly and 100 percent solar-powered, with onboard lithium-ion batteries that enable it to operate day and night without any noise or exhaust fumes. The system is anchored to the riverbed to utilize the natural flow of the river to catch the plastic and is designed for 24/7 autonomous operation, removing the need for dangerous manual work. Its floating barrier that is used to direct the garbage into the system only spans part of the river; it will not interfere with other vessels and does not harm the safety, nor impede the movement of wildlife – critical requirements when operating in major rivers. An internet-connected onboard computer monitors the system's performance, energy usage, and component health.

The Ocean Cleanup publicly presented these plans and unveiled the Interceptor™ 004 at a live-streamed event in the Port of Rotterdam. At the start of October, The Ocean Cleanup announced it was successfully capturing and collecting plastic in the Great Pacific Garbage Patch with its System 001/B, a cleanup system that is currently undergoing continued performance testing at sea.

About Boyan Slat

In 2011, at age 16, Slat came across more plastic than fish while diving in Greece. He decided to devote a high school project for deeper investigation into ocean plastic pollution and why it was considered impossible to clean up. He later came up with the idea to build a passive system, using the circulating ocean currents to his advantage, which he presented at a TEDx talk in Delft in 2012.

In 2013, Slat founded the non-profit entity The Ocean Cleanup, of which he is now the CEO. The group's mission is to develop advanced technologies to rid the world's oceans of plastic. It raised US\$2.2 million through a crowd funding campaign with the help of 38,000 donors from 160 countries. In June 2014, the Ocean Cleanup published a 528-page feasibility study about the project's potential. Oceanographers Kim Martini and Miriam Goldstein declared the concept infeasible in a technical critique of the feasibility study on the Deep Sea News website, which was cited by other publications. The Guardian

reported that as of March 2016, the Ocean Cleanup was continuing to test and refine the concept. The first and second missions both discovered failures with the system, but a third mission in 2019 showed that it can collect plastic.

In November 2014, Boyan Slat was awarded the Champions of the Earth award of the United Nations Environment Programme. HM King Harald of Norway awarded Slat the Young Entrepreneur Award in 2015. Forbes included Boyan Slat in their 2016 "30 under 30" list. In 2016, he was selected as a Thiel Fellow, the program started in 2011 by venture capitalist and PayPal co-founder Peter Thiel. It gives \$100,000 to entrepreneurs 22 years old and younger who have left or postponed college to work on their start-up. In February 2017, Reader's Digest appointed Slat European of the Year, and the Dutch magazine Elsevier awarded him Nederlander van het Jaar 2017 (Dutchman of the Year 2017). In 2018, Slat was awarded the Leonardo da Vinci International Art Award and Euronews award "European Entrepreneur of the Year".

Changes to SOLAS and MARPOL shipping and maritime regulations from January 2020

The new and far reaching IMO Sulphur Cap regulations have captured media attention in recent months for obvious reasons, but as well as this significant change, January 2020 beckoned in with it a raft of new regulations and amendments too – in total more than 30. Additionally, other new regulations are set to come into force later in the year too. But for now, here is a round-up of what you need to know about the new regulations and amendments that became effective from 1 January 2020.

SOLAS amendments

• Protection against noise (Amendments to SOLAS II-1/3-12)

Because of a discrepancy in the application of the Code on Noise Levels on-board ships there has been an amendment through a minor modification, in paragraph 2.1 of Chapter II-1/ Regulation 3-12. According to MSC.409(97), the existing paragraph 2.1 is amended to read as follows:

“1 contracted for construction before 1 July 2014 and the keels of which are laid or which are at a similar stage of construction on or after 1 January 2009; or”

• Damage control drills for passenger ships (Amendments to SOLAS II-1/19, III/30 and III/37)

Amendments to SOLAS chapter II-1 regulation 19 and chapter III regulations 30 and 37 to mandate damage control drills were adopted. The requirements are operational in nature with drills required at regular intervals for all passenger ships. According to MSC.421(98), the drills will have to involve crew members who have damage control responsibilities. Additionally, drills will have to be recorded and should cover different damage scenarios.

• Fire integrity of windows on passenger ships (Amendments to SOLAS regulation II-2/20)

According to MSC.421(98), Amendments to SOLAS regulation II-2/20 were drafted to clarify the requirements in chapter II-2 for the fire integrity of windows on passenger ships carrying not more than 36 passengers and special purpose ships with more than 60 (but no more than 240) persons on board. The amendments explicitly require that for ships carrying

not more than 36 passengers, windows facing survival craft and escape slides, embarkation areas and windows situated below such areas shall have a fire integrity at least equal to “A-0” class.

• Fire protection of domestic boilers (Amendments to SOLAS Chapter II-2/10.5)

The text of regulation II-2/10.5.1.2.2 has been amended. Prior to the amendment domestic boilers of less than 175kW were not required to carry an approved 135l foam-type fire extinguisher. The 135l foam extinguishers are now not required for boilers that are protected by a fixed local water-based firefighting system. According to MSC.409(97), in paragraph 5.1.2.2, the last sentence is replaced with the following:

“In the case of domestic boilers of less than 175 kW, or boilers protected by fixed water-based local application fire-extinguishing systems as required by paragraph 5.6, an approved foam-type extinguisher of at least 135 l capacity is not required.”

• Evacuation analysis is now mandatory (Amendments to SOLAS II-2/13)

Existing paragraph II-2/13.7.4 is deleted. New paragraphs II-2/13.2.7.1 and II-2/13.2.7.2 have been introduced which require escape routes to be evaluated to demonstrate that the ship can be evacuated in the required time. According to MSC.404(96), the evacuation simulation will be used to identify and eliminate congestion which may develop during abandonment and demonstrate that escape arrangements are sufficiently flexible to provide for the possibility that certain routes/areas may not be available as a result of a casualty.

- **Helicopter facility foam firefighting appliances (Amendments to SOLAS Regulation II-2/18 and the FSS Code Chapter 17)**

MSC.404(96) states that amendments to SOLAS II-2/18 have a new paragraph 2.3 to require a foam application system that complies with the new chapter 17 of the FSS Code. The new Chapter 17 of the FSS Code details the specifications for foam firefighting appliances for the protection of helidecks and helicopter landing areas as required by chapter II-2 of SOLAS. As per MSC.403(96), for helicopter landing areas, at least two portable foam applicators or two hose reel foam stations shall be provided, each capable of discharging a minimum foam solution discharge rate.

- **Fire safety requirements for cargo spaces containing vehicles with fuel in their tanks for their own propulsion (Amendments to SOLAS II-2/20)**

Cargo spaces on all ships used for the transport of motor vehicles

- (a) with fuel in their tanks for their own propulsion, that are loaded/unloaded into cargo spaces which do not meet the requirements of SOLAS II-2/20, "Protection of vehicle, special category and ro-ro spaces"; and
- (b) that do not use their own propulsion within the cargo space

are not required to comply with SOLAS II-2/20 provided the vehicles are carried in compliance with the appropriate requirements of regulation 19 and the IMDG Code, as defined in SOLAS VII/1.1, in accordance with MSC.421(98).

- **Requirements for lifeboats and rescue boats, launching appliances and release gear (Amendments to SOLAS Regulations III/3 and III/20)**

The SOLAS amendments and associated MSC Resolution (MSC.402(96)) include explicit mandatory text clarifying the requirements for the qualification, authorization and certification of service suppliers, procedures for maintenance and testing, and what should be carried out at each stage of testing (weekly, monthly, annually, and 5-yearly).

- **Mobile Satellite Service (Amendments to Chapter IV)**

Various regulations of Chapter IV and the Record of Equipment model form were amended to remove references to "Inmarsat" and replaced

with references to 'a recognized mobile satellite service'. MSC.436(99) clarifies that as a recognized mobile satellite service is defined any service which operates through a satellite system and is recognized by the Organization, for use in the global maritime distress and safety system (GMDSS)

- **Harmonization of survey periods of cargo ships not subject to the ESP Code (SOLAS XI-1/2)**

New regulation of SOLAS Chapter XI-1 has revised the SOLAS Safety Construction Renewal Survey window for cargo ships which are not subject to the Enhanced Survey Program Code, so as to be harmonized with the Renewal Survey window under the ESP Code. MSC.409(97) states "For cargo ships not subject to enhanced surveys under regulation XI-1/2, notwithstanding any other provisions, the intermediate and renewal surveys included in regulation I/10 may be carried out and completed over the corresponding periods as specified in the 2011 ESP Code, as may be amended, and the guidelines developed by the Organization, as appropriate"

- **Damage Stability Explanatory Notes (SOLAS II-1)**

Explanatory notes correspond to the extensive revisions of SOLAS chapter II-1, adopted by resolution MSC.421(98).

Amendments and revisions of codes

- **FSS Code, Chapter 8 – Automatic Sprinkler, Fire Detection and Fire Alarm Systems**

MSC.1/Circ.1516 includes a new provision for water quality testing for automatic sprinkler systems and new flow charts for the testing and replacement of sprinkler heads and water mist nozzles. The related amendment to Chapter 8 of the FSS Code adds a new requirement for special attention to be paid to the specification of water quality provided by the system manufacturer, to prevent internal corrosion and clogging of sprinklers.

- **IGC Code – Applicable fire integrity of wheelhouse windows**

The IGC code has been revised to align with the requirements given in the SOLAS regulation II-2/4.5.2.3. The amendments remove the requirement for A-0 fire-rated wheelhouse windows. MSC.411(97) states: "3.2.5 Windows and sidescuttles facing the cargo





area and on the sides of the superstructures and deckhouses within the limits specified in 3.2.4, except wheelhouse windows, shall be constructed to “A-60” class. Sidescuttles in the shell below the uppermost continuous deck and in the first tier of the superstructure or deckhouse shall be of fixed (non-opening) type.”

- **IGF Code – Regulations for fire protection**

The amendments remove the requirement for A-0 fire-rated wheelhouse windows, as per MSC.422(98).

- **LSA Code – Amendments on winches and winch brakes**

Corrections to the provisions relating to winch and winch brake test loads as prescribed in the LSA Code. MSC.425(98), clarifying that “Structural members and all blocks, falls, padeyes, links, fastenings and all other fittings used in connection with launching equipment shall be designed with a factor of safety on the basis of the maximum working load assigned and the ultimate strengths of the materials used for construction. A minimum factor of safety of 4.5 shall be applied to all structural members including winch structural components and a minimum factor of safety of 6 shall be applied to falls, suspension chains, links and blocks”

- **2008 Intact Stability (IS) Code – anchor handling, towing or lifting operations**

The Introduction and Part A of the 2008 IS Code have been amended to include fresh definitions and clarification about the new criteria. The criteria now requires an assessment of the ship’s intact stability when undertaking anchor handling, towing or lifting duties. The new criteria in Part B also require an assessment of the ship’s intact stability when undertaking towing and lifting operations.

Additional constructional matters are included in the amendments to part B of the 2008 IS Code covering the provision of a loading instrument, access to the machinery space, location of freeing ports, winch systems and on deck markings.

The footnote to title of chapter 2, General Criteria, of Part A of IS Code is deleted, to remove any misunderstanding that the referenced regulations of Part B become mandatory via a footnote.

- **1994 and 2000 HSC Codes**

New text has been added to chapter 8 – Life Saving Appliances and Arrangements. High-speed craft of less than 30m (2000 HSC Code) and 20m (1994 HSC Code) in length may be exempted from carrying a rescue boat, provided that the requirements in the sub-paragraphs of 8.10.1.6 are fulfilled, and

provided a person can be rescued from the water in a horizontal or near-horizontal body position (MSC.1/Circ.1185/Rev.1).

- **2009 MODU Code – Installations in hazardous areas, Fire Safety, LSA and Operational procedures**

Chapters 1, 6, 8, 9, 10, 13 and 14 of the 2009 MODU Code have been amended. As per MSC.435(98), revisions to the text include defining the ‘H’ class fire protection standard, changes to the required drills, provision of a dedicated rescue boat and allowing multiple fixed monitors to be used as an alternative to the drill floor fixed pressure water-spraying system.

- **IGC Code – Stability PC**

An approved stability instrument capable of verifying compliance with the applicable intact and damage stability requirements is to be fitted on board. The approval generally applies to the software using MSC.1/Circ.1229, but it may include hardware. This resolution revises the model form of the Certificate of Fitness for Carriage of Liquefied Gases in Bulk to reflect confirmation of this instrument or an accepted alternative during surveys.

- **BCH & IBC Code – Stability PC**

An approved stability instrument capable of verifying compliance with the applicable intact and damage stability requirements is to be fitted onboard. The approval generally applies to the software using MSC.1/Circ.1229, but it may include hardware. This resolution revises the model form of the Certificate of Fitness for Carriage of Dangerous Chemicals in Bulk to reflect confirmation of this instrument or an accepted alternative during surveys.

- **FTP Code Revision – Fire protection provisions**

The Code for Application of Fire Test Procedures, 2010, was revised by resolution MSC.437(99) to be consistent with SOLAS Chapter II which applies the same fire protection provisions for exposed floor coverings on passenger ships carrying not more than 36 passengers with those carrying more than 36 passengers.

- **FSS Code Chapter 13 – Arrangement of Means of Escape**

A revision has been made to 2.1.2.2.2 distribution of persons, case 2 for passenger ship evacuation analysis, for the purpose of clarifying the distribution of crew in public places. In particular, MSC.410(97) mentions that “Passengers in public spaces occupied to 3/4 of maximum capacity, 1/3 of the crew distributed in public spaces; service spaces occupied by 1/3 of the crew; and crew accommodation occupied by 1/3 of the crew”

- **International Maritime Dangerous Goods Code – Amendment 39-18**

The IMDG Code amends the following classification categories:

Class 1: Explosives – hazard divisions for packages containing pyrotechnic substances are revised.

Class 3: Flammable liquids – the marking, labelling and testing of packages containing viscous liquids are revised.

Class 4: Flammable solids – revision of the classification of self-reactive substances.

Class 5: Oxidizing substances and organic peroxides – packing instructions and methods are revised. Class 8: Corrosive substances – a completely new Chapter 2.8 is adopted.

Class 9: Miscellaneous dangerous substances and articles, and environmentally hazardous substances – the marking and packaging of lithium batteries are consolidated.

MSC.1/Circ.1588 recommends voluntary application of the amendments as of January 1, 2019.

- **BCH Code – Model Form of Certificate of Fitness**

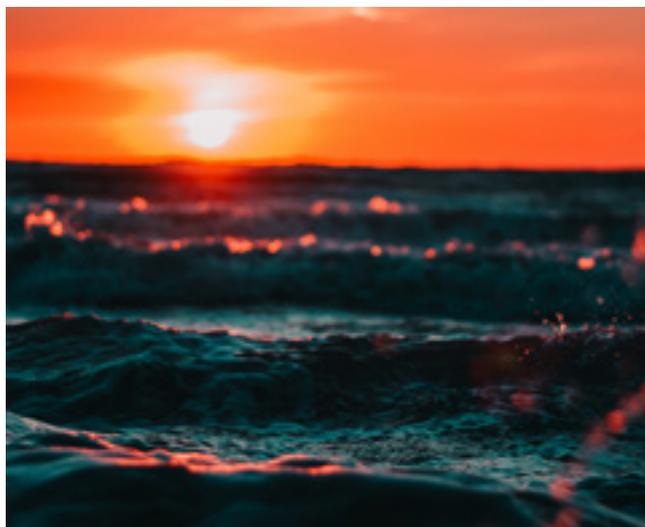
Revised text has been added to the model form to correlate with recent amendments to paragraph 2.2.6 of the Code, which requires provision of an approved stability instrument on board, or other approved methods for ensuring safe loading of cargoes.

- **IBC Code – Model Form of Certificate of Fitness**

Revised text has been added to the model form to correlate with recent amendments to paragraph 2.2.6 of the Code, which requires provision of an approved stability instrument onboard, or other approved methods for ensuring safe loading of cargoes.

- **SPS Code Revisions**

The form of the Record of Equipment for Compliance with the SPS Code (Form SPS) has been revised in the 'Radio Facilities' section to refer to the use of a "Recognized mobile satellite service ship earth station", rather than referring to a "Inmarsat ship earth station".



MARPOL Amendments

- **Sulphur Content in Fuel Oil (MARPOL VI Regulation 14)**

Sulphur content of any fuel oil used on board ships outside of Sox Emission Control Areas (Global Cap) shall not exceed 0.5% m/m on or after 1 January 2020.

- **Ozone-depleting substances, Hydrochlorofluorocarbon (HCFC) Refrigerants (MARPOL Annex VI)**

According to MEPC.176(58), regulation 12 of MARPOL Annex VI states that installations which contain hydrochlorofluorocarbons shall be prohibited:

- On ships constructed on or after 1st January 2020 or
- In the case of ships constructed before 1st January 2020 which have a contractual date of the equipment to the ship on or after 1st January 2020, or in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 1st January 2020. However, this does not apply to permanently sealed equipment where there are no refrigerant charging connections or potentially removable components containing ozone depleting substances.

- **Energy Efficiency Design Index (EEDI) (New Chapter 4 of MARPOL Annex VI)**

The CO2 reduction level includes three phases; Phase 2 starts on 01/01/2020.

The new chapter 4 Regulations on energy efficiency for ships to MARPOL Annex VI, makes mandatory the Energy Efficiency Design Index (EEDI), for new ships, and the Ship Energy Efficiency Management Plan (SEEMP) for all ships. Other amendments to Annex VI add new definitions and the requirements for survey and certification, including the format for the International Energy Efficiency Certificate.

EEDI reflects the amount of CO2 generated per tonne-mile (cargo carrying capacity). It constitutes a uniform approach to calculating a ship's energy efficiency during design and building of new ships and will be used to control CO2 levels emitted for future ships by encouraging improvements in ship design.

- **Ship Fuel Oil Consumption Database Guidelines (MARPOL VI)**

These 2017 Guidelines provide guidance to assist:

- Administrations in developing their program to verify ship's fuel oil consumption data;
- The IMO Secretariat on the development and management of the IMO Ship Fuel Oil Consumption Database, and describe methods that will be used to anonymize ship data to ensure the completeness of the database.

With thanks to Safety4Sea for their hard work to gather details about the new regulations and amendments

MARITIME TRAINING 2020 AND BEYOND



The maritime world continues its evolutionary change but are the skills of the seafarer keeping up with the technology as the role of the ship driver becomes ever more complex? We have to ask whether the training model used is fit for purpose, and if not, how it needs to change.

This article will, it is hoped, pose a number of questions that need to be answered in respect of moving forward to achieve the goal of providing an educational framework that encompasses the best in basic seacraft skills, with the technological, management and teamwork elements that now make up a good ship's officer which will shape the industry over the coming years.

An opinion article
authored by CAPTAIN PETER
MACARTHUR, CAPTAIN LES HESKETH
and CAPTAIN ROBERT BOOTH

The present

Training of ships' officers is carried out under the model ratified by the IMO (International Maritime Organization) in 1978. It took ten years to get the agreement of its country members for ratification and acceptance, so that by the time it came into being it was in effect out of date.

Certainly by 1978 the new technology which the 1939 - 1945 conflict had spawned was moving on a pace, yet little of it was incorporated into the training model other than Radar plotting.

Not only that, but many of the nations aligned to the IMO were beginning to realize that sea trade

could provide their population with work, but they may not be able to cope educationally with the examinations necessary to get the required maritime certificates.

This has led over the years to a number of protocols, drawn up at various venues, that have allowed the introduction of multi choice question written examinations and fixed question oral examinations - all accepted willingly by an industry that has taken up more and more technology in the belief that it will be better than well trained competent officers.

Yet we see that accident numbers have increased, crew contentment levels have deteriorated dramatically and the anticipated profits from increased technology and reduced manpower costs have

not materialised. The reality is one causal factor follows on from the previous, but they are all related. The industry response has been to stick with the plan and push even further along the path of the flawed STCW model - implementing ever decreasing educational, technical and human skill-competency standards all of which cost less. Therefore, surely, the profits must increase? Not so!

Fundamentally, the STCW model was and is critically flawed. From the outset it was historically based without any thought to the technological changes already taking place and from the outset failed to provide the up to date training necessary for a career in what has always been and continues to be a highly technical and demanding environment.



What is the problem with STCW Maritime Certification?

The definition of "seamanship" is a good starting point when considering the problems with STCW.

SEAMANSHIP: Skill in Navigating and Operating a Ship in ALL circumstances.

As an industry, we recognise (or should do) that instead of one "skill", the qualities for operating a vessel successfully requires many skills, areas of knowledge and behaviours. It cannot simply be defined as the manual skill of physically sailing or navigating a ship.

When a newly qualified OOW is appointed to take charge of a navigational watch, we generally assume that they have professional 'skills' adequate to

the task in hand. The industry's underlying premise is that they would not be there otherwise.

The STCW certificate of competency is acquired on the basis that the individual has been tested and found fit and sufficiently knowledgeable (competent) to operate ship-wide controls and manage its systems. That said, a newly qualified OOW does not always have a high level of "seamanship", previously

referred to. Any mariner will agree that "seamanship" is something that improves with experience as the skills and knowledge involved take time to develop and, as was the case in the past, are passed on to those coming through the training regime.

Taking the definition one step further. Seamanship involves self-discipline and the carefully judged application of acquired competency skills, behavioural

traits and theoretical knowledge. Correct and safe use of all these are, historically speaking, thought of as good “seamanship”.

The word “seamanship” is often used as a throw away comment to cover many situations. But experience, all too often, shows us that the foregoing underlying assumptions are far from the truth.

Good seamanship is something that separates the superior mariner from the average. It is not a measure of skill or technique, nor is it just common sense (our normal understanding and judgement). Instead, and historically, it is a measure of a mariner’s accumulated learning, their knowledge and awareness of the industry, transferable training on a multitude of different vessel types and an intimate knowledge, even relationship, with the maritime operating environment. Moreover, a good seaman will have a realistic understanding of his own capabilities and behavioural characteristics. This, when combined with good judgement, good decision making, attention to detail and self-discipline, begins to give us a reasonable understanding of the technical, professional competence and personal attributes that, more holistically and correctly, define the term ‘seamanship’.

Self-discipline and the exercise of good judgement are vitally important to the practice of good seamanship. Both require well developed character traits and a personal confidence borne out of practical experience that is tempered with wide ranging theoretical knowledge.

Good seamanship comes at a cost, a cost that the industry and its masters have not been willing to pay. How often have we heard this mantra down the years?

The issue of safety, competency and profit derives from a complex

set of questions with an equally complex set of responses. The cause is fundamentally systemic - with degrading crew competence, driven by falling skill levels and deteriorating situational awareness, declining safety standards have, inevitably, resulted in higher accident levels that have a commensurately greater cost to the industry as a whole. Profits must suffer. It is a natural consequence of weak regulation, poor training and declining seamanship levels.

A comparison between the maritime and aviation industries is often drawn, but commentators habitually fail to grasp that differing attitudes towards human-player and related safety-culture consistently impacts a single (accident) determining factor situational awareness!

It is interesting to note that both industries claim to use the same risk avoidance model James Reasons (2000) multi-layered ‘Swiss Cheese’ - accident prevention concept, whereby errors are captured, or mitigated for, at an early stage.

Unfortunately, as we shall see, claiming to apply the same model is where the similarity between the two industries ends.

The maritime and aviation industries have very different attitudes regarding how the Swiss Cheese model works in practice. The differences manifest very differently in training and professional value culture outcomes for the two industries which, in reality, are almost diametrically opposite - despite claims to the contrary. Consequently, it should come as no surprise that the accident safety record outcomes are very different.

It is one thing to make such a statement, it is another to demonstrate the output realities of the different cultures, and that is what this article sets out to show.

What do we mean by Situational Awareness?

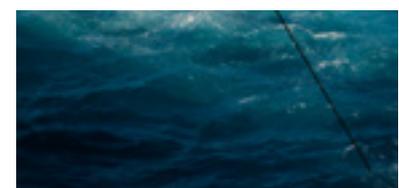
Within the maritime sphere, situational awareness is attributed to the ‘man on the bridge’ and can generally be defined as:

an appreciation of the vessel and how it is interacting with the environment it is operating in.

Those with a high level of situational awareness are deemed to be knowledgeable in relation to the mechanical status of the ship, geographical position, vessel course/speed and manoeuvring systems, cargo care, the proximity of other vessels and the potential hazards that they represent.

By this definition, “situational awareness” is attributable to the man on the bridge alone. Thus, someone with low situational awareness would, potentially, be in danger of running aground, damaging the cargo or colliding with other vessels that approach them unnoticed.

So far, so good! The industry’s answer to solving low situational awareness is increasingly found in the drive towards automation. The argument is simple - take the human element (the inherent weakness) out of the system and automate as many systems as possible, then the deteriorating industry safety record should resolve itself.



The STCW regulatory, training-safety model, has a natural cause and effect output, namely;

- **More technology**
... which requires
- **Fewer crew**
... who receive
- **Poorly regulated training**
(That is wide open to loose interpretation by different States)
... and who are, therefore
- **Cheaper and Less professional**
... arguable resulting in
- **Less Accidents?**
(because the machines do the thinking)
... offering
- **Greater profits?**

Consistently shown to be Incorrect at every level - therefore false economy



The simple reality is this model has consistently been proven not to work. Yet, within the maritime industry, where STCW was adopted around 1978, it has been supported by a regulatory framework which has driven training and competency standards towards the lowest common denominator using the arbitrary (and clearly unsupported) arguments that *all maritime training is equal* and *all seafarers are trained to the same standard* - (which they are not).

Anyone who has undertaken BRM training will (or should) have realised from the cultural research models developed by **Geert Hofstede** (1984) that not all nationalities will respond to training, assume responsibility or take to command authority in the same way.



So how do we see the future?

Seafaring is and always has been a vocation, but it eventually evolved into a profession. Inshore, coastal, and river transport took men and women into a natural world of adventure where the wide expanses of water were looked at as somewhere to be explored. No mountains or visible terrain just vast expanses of nothing - what was over the horizon?

So, the human interface has always been at the forefront of maritime, the link between the sailor, the ship and the forces of nature.

Knowledge of the ship and its interaction with the forces of nature was a fundamental aspect of shipping until the advent of the powered vessel. Steam power gave the ship and its crew some control over the forces of nature, they were not ruled by them. That ability has developed exponentially, especially over the last 30 years or so. The coming of the computer and its ability to control many of the navigational and engineering functions, was seen by the ship owners and managers as mana from heaven. Fill the ship with gadgetry

and there will be no need for crew!

Things have not actually worked out that way; aids to navigation such as ECDIS which should have prevented collisions and groundings have not. They still occur, so we must question why? Is it because the technology itself is at fault, is there an over reliance on such technology, or is it that the personnel using it are inexperienced or not trained correctly in its operation?

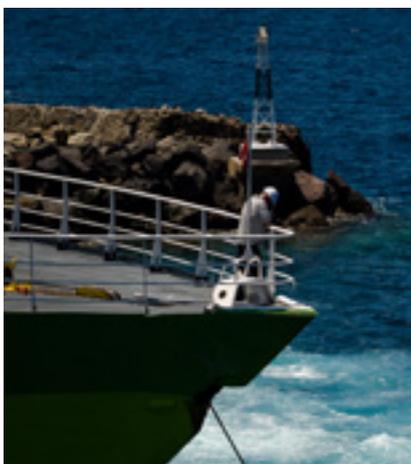
There most probably are elements

of both in the argument, technology that is not built to a standard which allows for easy human interface and the training and competency standards of those using it. An over reliance on technology by inexperienced poorly trained officers, who, when faced with confusing or conflicting information do not have the ability to respond and question what they are faced with, or have the ability to use the basic seafaring skills of practical seamanship, simply looking out the bridge window to have the special awareness necessary to safely navigate the ship without causing harm to themselves, others, or the environment.

Each new situation or task onboard ship needs to be assessed individually and resolved by the application of a sophisticated set of well-developed knowledge, skills and accepted practices by a professional mariner.

Professionalism has been defined as: *a self-disciplined group of individuals, who hold themselves out to the public, as possessing a special skill derived from training or education, and who are prepared to exercise that skill primarily in the interest of others.*

Professionalism is a requirement for resolving the complex and unpredictable problems faced by seafarers onboard ship. There is no single recipe for getting a ship, her cargo and crew from A to B. These skills need to be developed through appropriate education and guidance from experienced practitioners



So, where do we go from here?

There are three possible scenarios:

- Keep STCW review and modify.
- Scrap it, keep the model and rewrite in more modern terms incorporating new technology and training methods.
- Scrap it altogether and look at a completely new model of training, one that incorporates all the basic seamanship elements necessary and includes regular high-level training for assessment and evaluation in a real time simulated environment. (like aircraft simulators) and increase the use of Virtual Reality in maritime education training and operations.

But and it is a big BUT, are we too late? Have the movements to automate shipping overtaken us to the extent that we are fighting a losing battle? There is a body of opinion that tells us technology has already surpassed what we believed would be the future and for many it is here now.

Maybe now is the time, and, given the speed of development over the last few years - possibly our last chance to start discussing the moral, ethical and legal framework required to steer the evolution of digital life and to bridge the gap between what technology can do and what it might do - if we let it.

If we, as an industry, wish to retain mastery of the seas and create a place where our skills, knowledge and livelihoods mean something, then we need to be mindful of what is going on in the exponentially developing world of automation and human augmentation. We must begin preparing for, and accept the burden of, a new kind of maritime stewardship and exercise more prescient foresights. The

onus is upon us to become active in creating and implementing the ground rules for what goes on out of sight of land - in the watery wilderness that is the domain of we mariners and our forebears. We need to be decisive yet remain open-minded and flexible enough not to inhibit real progress.

- Daunting? Yes!
- Impossible? No!
- Alternatives? Regrettably none.

Whilst the scenario may sound dramatic and somewhat far-fetched, it is, in fact, barely a few years away and it is rapidly coming upon us. The technologies described, or alluded to, already exist. They are real and they are already being exploited – this is simply a statement of fact.

On current trend, if we do nothing to regulate or retain at least some legislative and human control of our industry and working environment, the seas risk becoming the domain of manipulated beings that service an autonomous shipping industry that could, in the space of barely a generation, be lost to most of humankind.

Our starting point must be to recognise what is going on and speak out. We have a moral, ethical and human obligation to make others aware of the risks that developing, then implementing, these unregulated technologies poses to our industry in the first place, then to other industries and, eventually, to all of mankind.

If what is here alluded to becomes the eventual outcome from this rapidly increasing technological drive, history may judge that our generation and those that we are currently training, were guilty of the greatest ever crime against humanity.

To do nothing, is to become redundant!

HELL ON WATER:

Container fires on ships are becoming increasingly common and dangerous

BY CHARLIE BARTLETT

In the early hours of the morning on May 24, an explosion was heard and a fire identified on the South Korean-flagged, 1,585-TEU KMTC Hong Kong as she sat quayside in Laem Chabang, Thailand. The fire spread throughout containers understood to be carrying noxious substances.

From across the river, a video was recorded and uploaded to YouTube showing a thick column of smoke becoming a sequence of plumes as devastating explosions occurred – apparently the result of tank containers carrying paraffin. Soon locals were reporting a burning sensation on their skin and breathing difficulties. A few hours later, 37 had been admitted to the hospital, poisoned or with fire or chemical burns. Some 143 were affected by chemicals in the smoke.

At the last update, the fire and explosions had encompassed

35 boxes, and 200 people were receiving medical treatment. Local news reports noted, as if in explanation, that the vessel had more than ten containers on board loaded with calcium hypochlorite.

Fires on container ships and the deaths associated with them are – as with various catastrophes in our modern age – threatening to become so frequent as to appear mundane. Not all of them, thankfully, have resulted in loss of life, but many have.

Perhaps they are inevitable. Vessels are getting larger. It might be thought that there's bound to be a container – one in thousands – the contents of which are dangerous but may have been misdeclared or not declared at all.

But with seafarer lives on the line and the sustainability of the maritime industry in general at stake, decisive action is required.

The Culprit

The culprit is hazardous cargoes, and by this what is almost always meant is one in particular: calcium hypochlorite or, to the rest of us, bleach. When loading these boxes, shipping lines place them on the outermost corners of the stack, ensuring that any blaze will be vented into the open air and, in theory, dispersed much more easily. It doesn't always work. It's never a surprise when those containers adjacent to a blazing box catch fire too.

But to place one at the top corner of the stack is to effectively halve the chances of this happening. However, thanks to their limited availability, these spaces carry a premium. Many shippers are unwilling to shoulder the extra cost and so, rather than declaring their cargo carries a shipment of calcium hypochlorite, they will lie, sending their boxes to the bottom or middle of the stack.

If a container catches fire here, it has the highest possible chance of starting a massive blaze. Fire needs fuel, and container lines have perfected the art of squeezing as much of it as possible into one place. The fire spreads to the neighbouring containers, and temperatures in the stack rise to hellish levels and spread outwards.

Such blazes often go undetected in their early stages. But once started, they can resist the efforts of firefighters for days, write off entire ships and, most grievously by far, claim the lives of entire crews.

In late June, a high-powered meeting will be held between representatives of hull underwriters, P&I clubs and container lines, discussing what can be done about what is rapidly becoming an epidemic. For them, it's make-or-break. "Representatives from more than 80 percent of world container capacity will be there," said a source at one of the major P&I clubs. "That meeting will address how the rules on dangerous goods will apply on container ships."

"Everybody is very animated on this topic," the source added, "and it's not just the claims committees within the P&I clubs - it goes right up to the top, to the International Group of P&I Clubs. If it's just a small claim the P&I clubs can pay it themselves. But if it's a massive claim, such as a major pollution claim, then they club together, and it's the International Group's reinsurance that pays out."

Indeed, the bill for the Maersk Honam fire in March, which killed five crewmen, is believed to have exceeded \$100 million already, putting it at the international level, in a case that will take years to solve.

"We're only talking a few hundred dollars per box, but non-declaration puts the whole ship at risk," the P&I source continued. "There's a huge incentive to get to grips with this. At the moment the pressure is on carriers to exercise better due diligence with regard to the contents of containers. However, the world's logistics chain is now so efficient that checking boxes in any number is not physically possible without causing huge disruption."

A Costly Con: Non-Declaration and Misdeclaration

Some shipping lines have responded with an ultimatum: They will simply refuse to carry calcium hypochlorite. But one need only glance at the history of Prohibition to see how that will turn out. It will do nothing to discourage those already lying about the contents of their boxes from continuing to do so, argued Standard P&I Club's Loss Prevention Director, Yves Vandeborn, at a recent conference.

"We see a lot of the major container lines simply refusing to carry it - that doesn't help," he said. "Industries need calcium hypochlorite, so by banning it more shippers will simply mis-declare it and try and get it on board anyway. In fact, if you do declare calcium hypochlorite it is a perfectly safe cargo to carry. The problem comes when you don't know you are carrying it."

Another complicating factor is alliances and consortiums. If a shipowner has refused to carry hazardous cargo but his consortium partner hasn't, he might well end up carrying that cargo anyway. The industry has also seen situations where consortium members have suffered because their partners are less diligent about verifying container contents.

It should be noted that there is much more than enough pressure on ship crews already without also requiring them to be firefighters. Yet if a fire is detected, that is precisely what they must become.

The terrifying proposition to combat a box fire low down in the container stack involves wading through smoke - which, as seen in the KMTC Hong Kong case, could very likely be toxic - to approach a container that, depending on its contents, might explode at any moment. Then the crew must drill, tap or otherwise puncture a hole in its white-hot surface in order to ram a water-mist nozzle into it.

On land, as horrifying as the incident at Laem Chabang was, there is at least somewhere for crew members and others to escape to and almost always a possibility of medical treatment. But at sea the situation is more dire by far. There will be little prospect of help if a vessel is in a remote location. Firefighting vessels are small and generally limited to coastal waters. The only options are to fight the blaze raging across the ship or abandon it.





Early Detection

A fire being detected in its early stages is relatively rare. However, a Norwegian company called ScanReach might offer a solution. Its new technology, called In:Sense, features a radio signal that can travel through steel with unique efficacy. A low-cost, temperature-sensor array throughout the vessel's cargo area, requiring no cabling – an arrangement unique to ScanReach – would give an up-to-the-minute readout of hold temperatures, ensuring that any fire could at least be identified and attacked in its nascent phase.

ScanReach's Chief Business Development Officer, Jacob Grieg Eide, notes that, thanks to the high cost of cabling, an equivalent network would hitherto have been prohibitively expensive and simply wouldn't be considered. It would most likely be severed in a fire anyway.

"Expensive and complicated cable systems are now obsolete," he says. "Our onboard wireless meshed network enables secure connectivity throughout the steel structure of ships and offshore units, and our system has already been successfully tried and tested through our cooperation with North Sea Shipping. Last April we installed a system with a meshed network

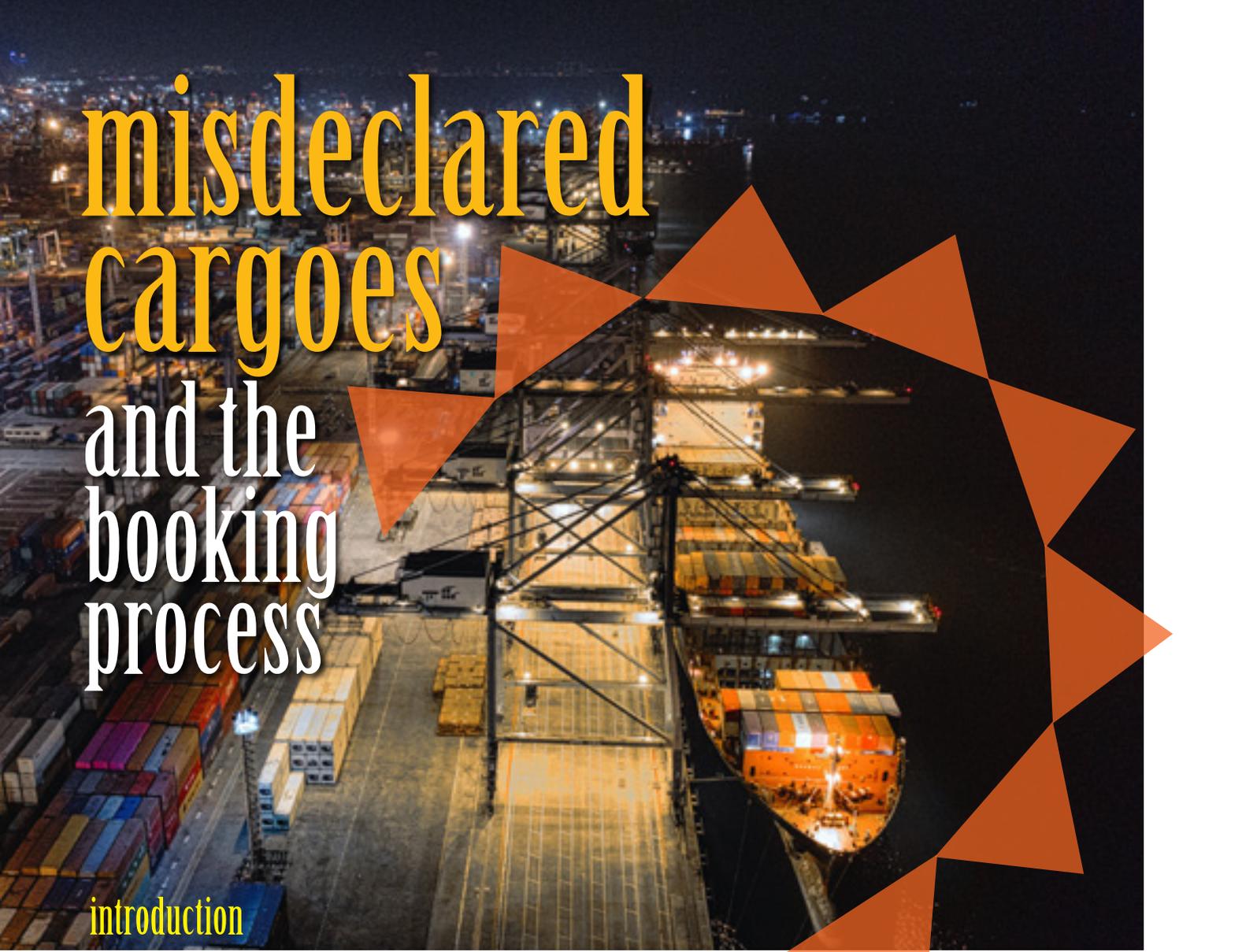
of more than 100 microsensors and 120 personnel tags throughout the North Sea Giant, one of the world's most complex subsea construction vessels. The results have been great."

ScanReach's system has various applications and was originally conceived to keep track of crew and passengers in the event of an evacuation. "The reaction of marine insurance experts to this technology has been overwhelming," he says. "Once DNV GL has signed off on the technology in its generic form, we will proceed with marketing In:Sense without delay. It is relatively cheap and takes just hours to install. This could be carried out during a port call as a ship lay alongside."



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misdeclared cargoes and the booking process

introduction

'Trust is the foundation of trade' stated Pearce L.J. in 1957 in the famous legal case *Brown Jenkinson v. Percy Dalton*. Today, we see this basic principle of shipping frequently ignored as unscrupulous shippers attempt to move their dangerous cargoes to markets cheaply by misdeclaring the nature of their goods. This is outright fraud and an unlawful act which endangers ships, their crews, cargoes and the environment. This act is also a major concern to marine insurers who are frequently left with the expensive consequences when incidences do occur. At Standard Club, we are well-aware of this bad practice and work hard with our members and the marine industry

to raise awareness of this issue and the grave dangers that it presents.

The world today Misdeclared cargoes – background – economies of scale

Each year between 2 - 6.6 million containers, packed with dangerous goods, are wrongly declared as non-dangerous and are loaded onto ships. The huge range is commensurate to the challenge of trying to combat misdeclared cargoes. Misdeclared cargo in these containers can become vulnerable and ignite, explode or leak at any time, therefore it is no surprise that there has been an increase in the numbers of cargo fires across the industry in recent years, causing great damage to the ships, those onboard, and their operators' reputations. It seems that ship operators are not taking sufficient

special precautions when it comes to preventing carrying misdeclared cargoes. And so, the problem persists. While the exact percentage of containers that are misdeclared is subject to considerable debate, many experts maintain that about one-third of all containers are wrongly declared. That is clearly a major concern, but the reality may be even worse. The TT Club, another specialist marine insurer, has published their research in which they state that about 10% of the containers in a typical voyage will hold hazardous or dangerous materials. If accurate, one of these modern giants [of 18,000 TEU] could be carrying around 600 containers filled with hazardous or dangerous materials, and their certificates are wrong or incomplete.

Ship operators therefore need to do everything in their power to avoid loading containers carrying dangerous cargoes – whether it may be intentionally and fraudulently misdeclared or due to a mistake.

How we got here – casualties

A cursory search on the internet for casualties arising from fires on board container ships will reveal lengthy accident reports and related news on the subject. On March 21, 2006 – M/V Hyundai Fortune suffered a major explosion about 43 miles off the coast of Yemen in the Gulf of Aden. An estimated 60 – 90 containers were blown overboard.

In July 1999, the CMA Djakarta was off the coast of Cyprus when there was an explosion on deck followed by a fire. Despite significant efforts, the crew could not control the fire and further explosions occurred. The vessel was abandoned and subsequently grounded off the Egyptian coast where salvors took over.

Hapag Lloyd's ship 'Yantian Express' with its major fire, the 'MSC Flaminia' explosion in July 2012, and the ongoing investigation of the 'Maersk Honam' fire remain fresh in maritime memory. A team of German accident investigators examining the circumstances

of the fire on board the Yantian Express advised recently that they suspect a container was filled with coconut charcoal when it was supposed to be carrying coconut pellets. Coconut charcoal is also known as pyrochar, a dangerous substance often used in barbeques, is susceptible to self-combustion. This may yet be another case of cargo misdeclaration.

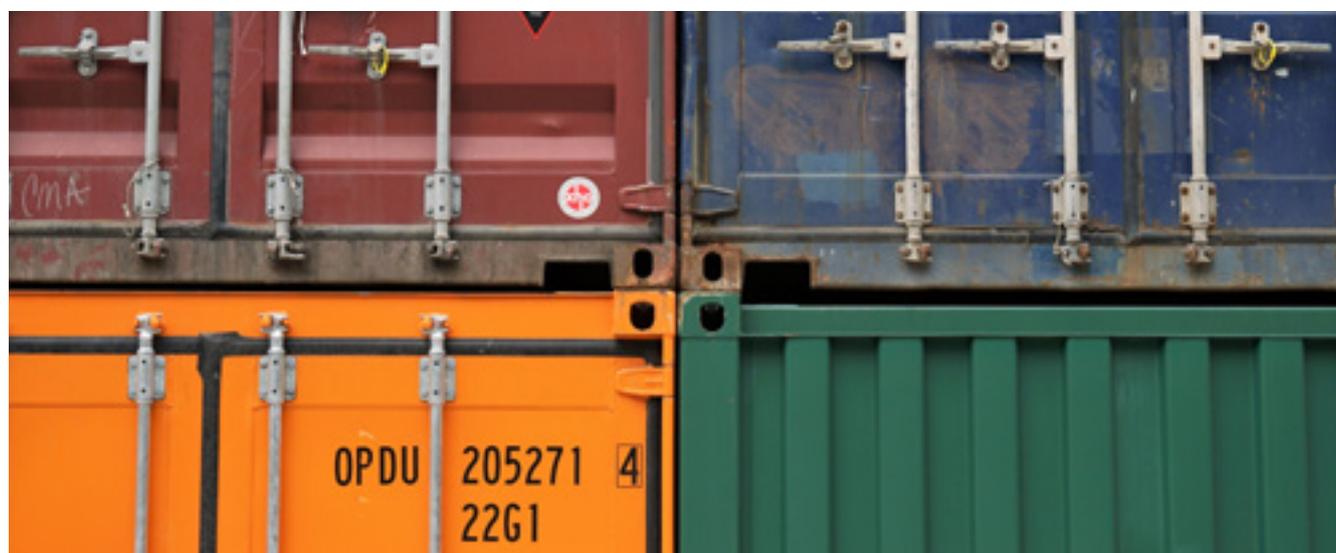
Why do these casualties occur? Many arise from the deliberate misdeclaration of cargoes as shippers strive to avoid the additional freight cost and/or the effort required to pack, label, store and handle the dangerous goods in the containers. This fraudulent and criminally dangerous behaviour frequently costs lives, millions of dollars in cargo losses and ship damage. It also causes significant delays in cargo supply chains amounting to major disruption across numerous industries in these 'just-in-time' days.

Unfortunately, it does not stop there. On 12 August 2015, a series of explosions killed 173 people and injured hundreds of others at a container storage station at the Port of Tianjin. An overheated container of dry nitrocellulose, a dangerous product that is flammable and explosive when dry, was the likely cause of the initial explosion.

Misdeclared cargo – how is it misdeclared?

Consider the case of calcium hypochlorite which is a product used for sanitising public swimming pools, disinfecting drinking water and can be used as a bleaching agent. Global production for both domestic and export markets is estimated at about 400,000 tonnes a year and it is normally shipped in granular or tablet form. The product is generally designated as an IMDG class 5.1 oxidising agent due to its high oxygen content. At normal temperatures, it slowly decomposes to release heat, oxygen and chlorine gas. At higher temperatures the rate of decomposition increases and, if the heat is not able to escape, a chain reaction can result in a fire and/or explosion. The quality of the product also determines the rate of decomposition.

Dangerous goods require special packaging and stuffing, with limits on package size and quantity per container. This explains the principal reasons for shippers' fraudulent misdeclaration of dangerous cargoes. It saves them time and money – and because there is a good chance of getting away with it. Therefore, some shippers try to move calcium hypochlorite by describing it as, for example, calcium chloride, whitening powder, water treatment compound, bleaching powder, disinfectant, chloride of lime or chlorinated lime.





Detecting this misdeclaration requires skill, knowledge and training in the shipowner's / carriers' booking offices. Increasingly, specialist software is used to assist the discovery of these shipments. Commencing in 2011, Hapag Lloyd developed their own in-house product called Cargo Patrol which has assisted in the detection of thousands of instances of incorrectly declared dangerous goods

Not every carrier shipowner or carrier is as diligent. For example, carriers' booking offices usually produce a draft bill of lading after shipping instructions have been received, using the information provided at the time of booking. The final bill of lading is then prepared by the documentation department usually at the last moment before loading the container on board, which can be quite a bit later than when the shipping instructions were first received. It is at this point that a fraudulent shipper can request changes, such as switching the description from an accepted non-dangerous cargo to a dangerous one or adding the correct cargo description in the 'marks and numbers' box of the bill of lading. The mismatch can also be for declared dangerous cargoes, with a more dangerous or additional one appearing on the final bill of lading. Documentation department staff usually do not have the same level of training as the booking department staff do, facilitating the oversight of these last-minute changes.

Misdeclared Cargoes – tightening the booking process!

Ultimately, the critical issue is for shipowners and carriers to know their customers better. Who is the real shipper? We are aware of the dangers of brass plate companies which are established to disguise the identity of the true shippers. These companies can still be identified but this discovery process requires diligence, research, and above all, time - a rare commodity in the container trade. An enhanced new customer vetting process needs to be in place, and it should apply to all shippers and freight forwarders. All booking office staff and agents need to know and trust their customers. This means doing due-diligence checks on new customers and their supply chains or, in the case of slot charterers and freight forwarders, confirming what checks they use on their own customers. It is vital that the manufacturer of the goods – if not the customer – is identified and verified, and that the testing laboratory being used is both reputable and independent of the customer or manufacturer.

We recommend that the following key points are part of the booking process:

- Use of synonym list through due diligence software to detect suspicious shipments
- Clearly defined and enforced booking deadlines for both DG and non-DG cargoes as well as for existing and new customers

- All documents submitted at booking stage are thoroughly examined
- Background checks on all manufacturers to ensure that they actually produce the declared cargo. If that is not possible, due consideration should be given to physically inspecting the goods in the container during the stuffing.
- Dangerous goods training must be provided to all booking office staff, including the dangerous goods desk, the non-dangerous goods desk, the documentation control department, head office and all regional and port offices. It should include full-time, part-time and temporary staff of all levels of seniority.
- Implement deadlines for DG cargoes to ensure that there is sufficient time for due diligence checks on the proposed shipments
- The Harmonized System (HS) is the international standard to describe cargoes for customs purposes. Booking office staff and agents should insist on the use of the correct six-digit HS codes for all bookings, both dangerous and non-dangerous cargoes before considering accepting them for shipment
- Computerised booking systems must also be robust, reliable and secure, with procedures in place for regular software updates and continuous data back-up. The system must be accessible by all booking office staff so that all documentation and communications relating to the booking can be viewed at any time.



Misdeclared Cargoes - Economies of scale – consortium / slot charterer biz

Special mention should be made about slot charterers which refers to the sharing of spare capacity on container ships to maximise the cargo loaded on each voyage. There are sound economic reasons for this practice, but the commercially sensitive and confidential nature of these shipments means the carrier operator is usually provided little information other than the container number, weight, destination port and carriage requirements of non-dangerous goods containers. The shared information does not usually include what the containers actually contain. As such, the carrier relies totally on the due diligence checks of the slot charterer.

There have been cases where a carrier bans the carriage of, for

example, calcium hypochlorite but the slot charterer does not. This results in a carrier transporting a container that is otherwise banned on the vessel.

summary

In summary, a single incorrectly declared container is enough to trigger a catastrophe. We know that a large number of containers are misdeclared daily. The serious dangers and risks associated with this practice are not acceptable and cannot be allowed to continue. The container industry needs to work together to tackle this problem and this collaboration is underway. Shipping companies are urged to examine their cargo booking processes carefully and to make improvements, implement better and more efficient controls through, for example, specific DG training for all of the non-DG and DG booking staff or through the

use of specialist computer software that can scan booking applications for suspicious products. Shipping companies are also urged to know their customers as well as possible. This is imperative for effective safety management.

Finally, slot charterer and vessel sharing agreements should be closely examined. Owners should assess the operating standards of their partners to ensure that suspicious cargo bookings are detected prior to the cargo being loaded. We understand that every additional inspection in the supply chain is a potential 'friction' that slows down the transport of the cargo. Only in an ideal / compliant world, can these checks be done away with. Today, these checks are unavoidable in the interests of safety and the protection of the ship and crews. Checks and balances must be in place for trust to be restored in the shipping industry.

References: Standard Club publication "Better box booking". Free to download: <http://standard-club.com/media/2679007/standard-safety-better-box-booking-march-2018.pdf>



The Internal Inspection Revolution



The seaworthiness of a vessel is one of the most important considerations for any maritime operator. Whether you are responsible for a small passenger ship or bulk carrier, compliance laws are getting stricter to ensure that crew members and passengers are kept safe and marine pollution levels are kept to a minimum. Penalties can be serious, but if a ship isn't inspected and maintained, it can also have a serious detrimental effect on a ship's trading ability, meaning additional time waiting for critical repairs either stuck in port or out at sea.

Taking preventative measures is surely better than suffering mechanical failure in the middle of a voyage or fighting a lengthy legal battle, but with the costs associated with regular inspections, many operators still choose to take the risk. Any kind of inspection is notoriously difficult on a ship, and the hazardous nature of the environment, combined with the harsh conditions to which vessels are exposed mean that regular inspections of a ship's structural integrity as well as its tanks and internal infrastructure need to be carried out at least once every 12 months. But surveys take time – hundreds of man hours can be spent inspecting each and every nook and cranny of a ship's internal and external structure – looking for structural deformation, cracks and any signs of wear and tear which may pose a risk to either crew members, passengers or the marine environment. Time is money after all...

Time Saving Technology

One of the greatest benefits of technological advancement is the amount of time it has saved us completing basic or laborious tasks. From maps on smart phones to email – many of us don't know how we survived without digital technology and there are greater innovations being released each day, with automotive vehicles and robotic healthcare systems already being trialled across the world. One technology which is having a massive, disruptive impact in many commercial sectors is the Unmanned Aerial System (UAS). In as short a time as five years, UAS, or drones, have revolutionised

the way we can look at the world and our surroundings. Forget about spying on your neighbours or taking an aerial image of your house – commercial UAS are saving businesses huge amounts of time and money.

The ability to remotely view and capture imagery from the air has meant that UASs are being used to complete commercial and industrial tasks which are notoriously difficult and dangerous for workers. From inspections of tall structures such as powerlines and wind turbines, to assisting with search and rescue missions in an emergency situation such as a fire, drones are making hazardous working conditions a consideration of the past in many industries.

Drones do have their limitations though. Many drones are limited in flight time, payload capacity and also need a clear space in which to fly, making them suitable for outdoor use only. These limitations have meant that a survey of complex structures or confined indoor spaces has until now been undertaken manually.

The most common drones on the market, both in the commercial and hobbyist markets are quadcopters. As the name suggests, quadcopters have four rotors which propel the drone vertically into the air. These exposed rotors mean that the drone relies on clear airspace for both safety and performance, and high winds and heavy particles such as sand and dust can render many models unflyable. The exposed rotors also pose a risk of personal injury as well as damage to the unit should it come into contact with a person or object such as a wall, or tree, again, meaning that a quadcopter cannot be used in close quarters.



Enter the Elios 2 – the World’s First Collision Tolerant UAS



The idea of flying a drone in a confined space would make most drone pilots wince. Add limited visibility into the scenario and the concept is unthinkable. This is the scenario faced by those who carry out ship inspections. Dark and cramped conditions, with limited visibility and manoeuvrability. Climbing inside a pressure vessel, chemical or gas tank is a daunting task for the ship operator, with lighting, safety rigs and access equipment needing to be set up prior to the inspection. For the surveyor, it's worse and the risks are huge. If only there were a way to send in a drone to do the dirty work...

Enter the Elios 2, the world's first collision tolerant drone. The Elios 2 can be operated safely indoors, in complex and confined spaces and in places where they could come in to contact with people. It is the first UAS of its kind to be designed with a frame to protect the rotors, which means that it can bounce off, or roll across obstacles or people without any damage to the unit or person.

The Elios 2 presents a great number of advantages to maritime operators who wish to improve the safety and efficiency of their surveys. One unit can carry out tasks in minutes, as opposed to the hours it would take a human operator. Ready to deploy almost instantly, the Elios 2 also provides the ability to capture data and imagery remotely, which can be accessed immediately, and used in the construction of 3d maps to allow the production of time lined data for comparison in the future. In the event of an incident or potential threat to the ship's integrity, this fast response can be crucial when it comes to limiting damage or downtime.

Traditional tank inspections often require units to be drained, cleaned and ventilated before surveying crews could be permitted access. Often air pollutants also need to be monitored to ensure the safety of those entering the space. Add to this the amount of time taken to erect scaffolding or safe rope

access and you could be talking days before the area is rendered safe enough for work to commence. The Elios 2 can be used to carry out an initial inspection without any of these considerations, allowing an accurate assessment to be made as to the maintenance work required, if any, saving time and money.

Other industries are already making use of the Elios 2's capabilities, most noticeably the UK's water authorities, whose infrastructure inspection team have been using the drone for sewer and asset inspection for the last two years. As well as the appreciable benefits to staff health and safety, two organisations, Thames and Severn Trent Water Authorities, partnered with COPTRZ, the UK's sole Elios 2 distributor, and reported a combined saving in excess of £4 million in their second year of operation, and expect to roll out UAV technology further in 2020. Adoption of the technology within workflows was swift due to the individual training program delivered to operators of the drone upon delivery, and the construction of 3D geotagged maps has created a valuable future resource to monitor surface degradation.

And then there was light...

Laws in most countries prohibit UAS operators from flying too closely to buildings, vehicles and people, due to a perceived lack of control of the unit which could pose a risk to people and infrastructure. Thanks to its protective cage, and the fact that the Elios 2 is used purely for internal inspection, it's use is not limited by international Air Law, and its operation poses no such personal risk. Equipped with an innovative wireless communication system which provides live video feedback, it allows the pilot to fly in places beyond their visual capacity, whilst maintaining navigational

control. This 2.4Ghz communication link offers high-quality data transfer and is easy to use and operate. Imaging feeds are also saved on to an onboard data card to allow for retrospective analysis.

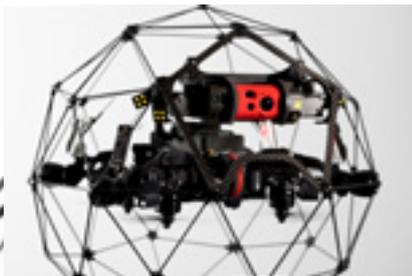
The Elios 2 also features onboard LED lighting which helps the pilot to navigate, as well as improving the quality of the video and images collected, and the standard payloads also include a separate integrated thermal camera which can help further where visibility is limited. Thermal imaging cameras provide a non-intrusive way of identifying temperature differentials which can be present in an impending mechanical failure, and are also great at detecting leaks and cracks in tanks and other structures, and can even detect moisture intrusion which can be difficult with the

naked eye; on a ship, this can be an invaluable early warning sign of a bigger problem.

One of the greatest benefits of UAS systems has been the ability to collect imagery, data and video remotely, removing surveying staff from potentially hazardous situations. The Elios Ground Station enhances its proposition by giving the UAS pilot access to live telemetry data and SD video being captured by the Elios in real-time. The telemetry data interface communicates battery level, signal strength and relative heading and altitude, all important measurements for any drone flight, yet specific to the Ground Station is the ability to monitor light intensity and camera exposure. When carrying out inspections inside a ship, or tank, light will be limited. Being able to monitor conditions and adjust settings to suit can be the difference between a successful survey and a waste of time and money.

Compliance Made Easy

Utilising drone technology can make all the difference when complying with the ISM code and creating a robust and easy to execute Safety Management System. With such a large amount of importance placed on crew and passenger welfare, anything that can help to lessen exposure to hazards has to be explored. Autonomous technologies are set to revolutionise our world and whilst we wait for our driverless cars which will cut road deaths, and robots which will carry out surgical procedures, we can make use of the technology we have now. UASs are proven to increase the safety of workers in numerous situations. The Elios 2 has now shown that this is possible even under the most difficult of circumstances. Ships are dangerous places, with unique characteristics and hazards which require specialist considerations.



For more information on the ELIOS 2 and the benefits it could offer your organisation, contact COPTRZ at info@coptrz.com, or call 00 44 330 111 7177.

ADVANCES IN BATTERY SAFETY & TECHNOLOGY



By **Brent Perry**, CEO, SPBES
with a forward by **Chris Kruger**, CTO, SPBES



by **Chris Kruger**

A Li-ion battery has several potential hazards that must be considered in order to keep people and equipment safe. It is important to consider these hazards for each stage of the battery life, not just the day it is installed. From manufacturing through to delivery, installation, commissioning, maintenance and eventually the recycling of the battery, safety must be first and foremost.

At the core of the system is the lithium-ion cell; a chemical power plant that cannot be simply switched off in order to make it safe. A battery cell is by its nature always live; therefore, it is important to ensure the safety of personnel from this potential hazard. The voltage on a single cell is low and therefore not hazardous, however the potential current is very high since the internal resistance of the cell is low. Shorting the positive and

negative with a metal object will either result in the battery terminals evaporating or the metal object getting very hot.

During manufacturing, special tooling and processes are used to decrease the risk of short circuit of a cell. When the cells are assembled in series to form higher voltages collectively in a module, the voltage becomes more dangerous. Again, special assembly tooling is used to protect personnel against accidental shorting. Once assembled it is important to protect personnel from this voltage during transportation, installation, commissioning and de-commissioning.

For this, SPBES uses a contactor inside the module to isolate the battery voltage from the battery terminals. This contactor can only be closed by the Battery Management System (BMS) during operation, therefore eliminating all voltage related hazards when it is not in use. The total battery voltage once installed is very dangerous considering we commonly install batteries at bus voltages higher than 700VDC and up to 1500VDC. The protection for this is done through proper isolation design, the use of breakers and independent safety circuits like high voltage interlocks, independent breaker trips and ground fault detection.

The system is also designed to reduce the voltage anywhere on the installation to less than 100V when the system is off. This ensures that any unintentional shorts will not result in a dangerously high current and potential damage to the system.

Thermal runaway is a potentially catastrophic hazard that must also be in the front of an engineer's mind when designing a lithium-ion battery. It is rare that thermal runaway occurs, but the impact can be devastating when it does. Our design philosophy is to eliminate the risk completely through our patented cooling system, CellCoolTM.

Rather than trying to manage the potential consequences of a thermal runaway event, SPBES has always focused on removing this hazard completely. Even if the cell heats up, regardless of the reason, SPBES' system can remove the heat quick enough to prevent thermal runaway from occurring. Additionally, SPBES's cooling system protects the cells from external heat sources such as a fire outside the battery.

Our philosophy has always been and always will be to protect the vessel and crew to the best of our ability, incorporating new safety innovations from our R&D team as they become available.



ForSea Aurora travels from Denmark to Sweden using EV battery Propulsion



ADVANCES IN BATTERY SAFETY AND TECHNOLOGY

by Brent Perry

Battery technology has evolved very quickly, but hybrid and electric marine propulsion is still a relatively young industry. As of today, there are still no commercial systems that can claim to have been in operation for 10 years. Despite this, the economic and environmental advantages of battery storage have meant that there are now dozens of ships operating in hybrid and full electric modes. By recent estimates, Energy Storage Systems (ESS) are now being incorporated in roughly 75% of refits and newbuild vessels around the world.

In 2009 I designed my first lithium batteries for marine applications. These were designed to demonstrate the principal that MW scale ESS could work like traditional propulsion while delivering real commercial value; and there were a lot of doubters. Today, we have evolved not only performance, but safety, integration, cost and risk management to much more predictable levels. The data obtained from constant commercial use of the battery system provided invaluable information that allowed us to evolve and continuously improve our systems.

The Classification Societies and Flag Authorities have also constantly pushed for better and better systems. These agencies have been incorporating powerful risk evaluation tools to ensure operator and passenger safety as system capacities got bigger and bigger.

Operational data and experience have led to significant

improvements in battery design resulting in improved safety, system life, risk reduction and overall performance. The improved performance of modern marine batteries has also changed the market. Lower system cost means more and more marine verticals are now finding ROI from energy storage. For example, during the formation of the marine ESS industry, tugboats and ferries represented the best commercial applications for energy storage systems. Today we can add cruise ships, oil and gas, offshore and wind farms vessels to an ever-growing list of commercial vessels that are making an ever-greater use of energy storage.

The key considerations of effective battery design start with two principal issues 1) an ESS must be an improvement to the existing methods of operating ships, and 2) the solution has to deliver financial benefits without external support (government grants or tax credit schemes) in order to permanently earn its place as a part of system design.

These are the key questions that we asked when at the design table for our current systems, understanding that they are the key to success. However, we also knew from years of real-world experience that the following criteria are also critically important to long term commercial success:

Safety: we had to be able to effectively eliminate the possibility of thermal runaway in a battery

system, otherwise we will never see true acceptability in the markets and growth in system size. This challenge was at the top of our minds in every design decision, and we addressed it by creating our patented CellCool™ cooling system that effectively removes the risk of thermal runaway.

The principal is very simple; reduce the temperature of the cells at a faster rate than the cell increases in temperature. No matter how hard you work them, with CellCool™ they will not achieve the temperature required to go into thermal runaway. We worked in cooperation with Classification Societies and Flag Authorities to develop what we all felt were difficult to pass safety tests designed to demonstrate that batteries are inherently safe. We took this to another level and set our own gold standard as safety in the face of spontaneous combustion- the most difficult test that a battery can face.

Even in this very demanding test, we have proven success. Our systems are able to prevent significant damage to the battery (including propagation at the cell level) and ultimately make every system safe to operate. This is done with an inherently simple liquid cooling system. It cannot be achieved with air cooling systems due to the issue of managing transfer of heat with something as energy dense as most lithium chemistries.



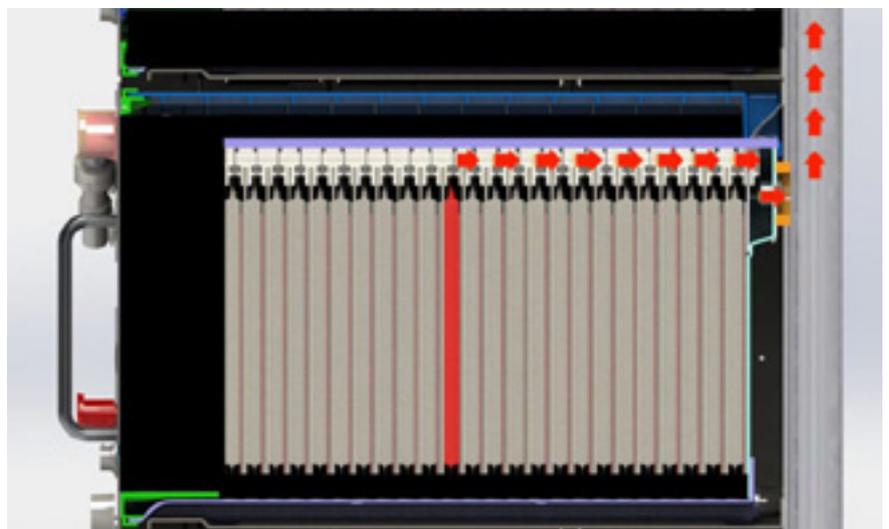
*Waxholmsbolaget Yxlan
Ice-class hybrid passenger ferry provides
year-round travel in the Stockholm Archipelago.*

Safety has other considerations as well; there is disaster safety at the cell level, and then there is safe use of batteries. We designed a BMS that is inherently focussed on protecting the ship, the battery system and the cells. This is done at its core by monitoring the voltage and temperature of every individual cell in the system, and then balancing the performance of the vessel within the safe operating principals of the ship.

There are two different ways to design a BMS; one that is ideal for a fully electric ship and one that suits hybrid applications. While both in principal will give the operators choices in the event of a battery failure, in a fully electric ship, the safe operation of the vessel becomes the guiding principal of the decision making of the BMS and Power Management System (PMS). In a hybrid application, the batteries can become the focus of the performance of the PMS as the vessel has alternative propulsion systems and is not totally reliant on the battery for operation. Once we define the type of application as either hybrid or electric, we can optimize the operational logic of the BMS as it pertains to the PMS/ operator decision making criteria.

Another critical element of safety in design has been the inclusion of contactors in our building block modules. Basically, as we are building DC voltage systems that range from 300-1500VDC, the risk of personal injury in transportation and service are very high. For example, a 1500 VDC arc flash can permanently disable a technician. By adding contactors in the individual battery modules, we eliminate voltage at the terminals until the system is fully engaged and the BMS can approve that all cables are correctly sequenced and protected. There is no voltage or

power on the terminals as long as they are open. We also reduce the risk by isolating the building blocks as single units no matter how large the overall size. The element of crew safety of our technicians and the operators of the vessels cannot be overstated in terms of benefit to our customers. We can now train ships engineers and crew to do maintenance on the batteries, we don't need to bring in specially qualified electricians to do basic maintenance. This design decision was not free, but it is the right way to go to improve overall safety for our customers ships.



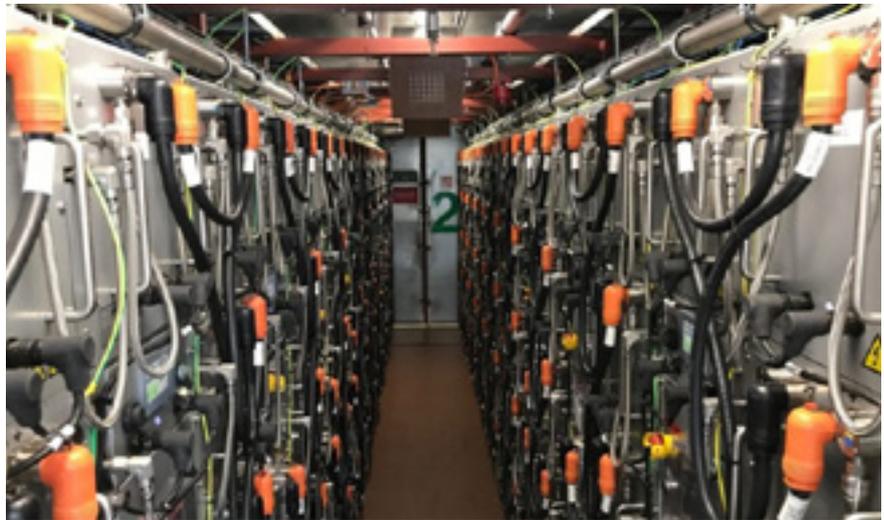
SPBES patented eVent system showing path of gas extraction in a single cell thermal event.

Cost: Another critical part of the design of a battery is not the actual battery itself, but the space the battery operates in. The impact of incremental costs of necessary added systems required for safe operations is significant. In most cases, and in our earlier designs, things like fire safety, fire detection, gas detection, gas extraction, cooling and emergency ventilation were left to other contractors and not included in the cost of the battery system. These so-called add-on systems are actually critical to the performance of a battery and are not optional, but in most cases battery suppliers will leave these added costs to the ships builders.

Our approach became more holistic and covered all parts of the battery system as our design evolved, which means less added cost per kWh and more integrated engineering. Our next evolution in development is to validate the design of our core modules to withstand an A60 battery test. Validation of this test will eliminate the need to build an A60 enclosure for the batteries.

To put this in context, one of our integrator partners determined that the typical added cost of a battery system could be as high as \$275/kWh for a total battery installation, this cost comes on top of the cost of the batteries themselves. It is essential that integrators and end customers always understand the overall system costs to allow decisions to be made on return on investment based on the actual installed system costs not just the battery cost. In fact, SPBES is not completely immune to this cost; our liquid cooling requires chillers sized to meet the power demand of the system and our gas extraction system must be correctly vented, but instead of \$275/kWh, we face a cost typically of \$20/kWh for the added components and to meet all performance requirements.

Another benefit of SPBES CellCool liquid cooling is the ability to actually predict the life of our systems. Air cooled systems are



SPBES 1MWh battery located inside a 20-foot ISO shipping container.

very dependent on the ambient battery room temperature to be able to manage the overall life of a lithium battery, and they are very fickle. Even a small increase in ambient battery room temperature will affect the temperature of the lithium cells and can have a significant reduction in calendar life. In contrast, liquid cooling maintains the temperature of the cells at a fixed range and we can eliminate the impact of ambient temperature on the performance life of the cells.

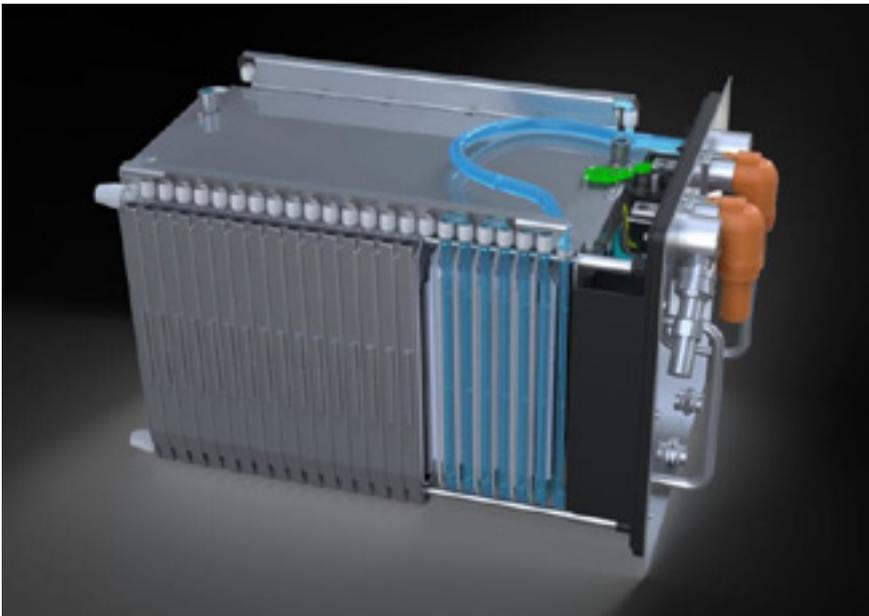
As system life continues to be in the 10-year range and with many operators seeking longer-life solutions, eliminating temperature as a variable goes a long way to meeting lifespan requirements. There are still a large number of factors that will influence battery life, but temperature is by far the most impactful.

System Size: Another area where we have seen a significant evolution both in the use of cells and the design of a battery is size. Cell manufacturers have significantly improved energy density over the last ten years. By increasing the energy density of the lithium-ion cells, a significantly smaller system can be created. For example, a system with 88kWh per module versus a battery that has 65kWh per module has already achieved 35% improvement of weight and space required for an installation.

As long as the cycle life meets the lifetime need, this is a huge improvement. In my experience, increases in energy density tend to a reduced cycle life.

The other significant feature of any system is the percentage of energy available on a continuous basis. On our first-generation air-cooled design, the continuous rating was about 70%. This meant that if we needed 1MW of energy, we needed to have about 1.4MWh of capacity to operate at 1MW load. This meant a larger, heavier system that was also significantly more costly to install and maintain. If we assumed that the battery system cost \$100/kWh, then a 1.4MWh battery would add \$140,000 to the capital cost of the system – and does not even consider the ongoing performance and financial impacts of the increased size, weight and maintenance!

A liquid cooling system allows SPBES to use significantly more of the battery capacity. This really means we can greatly reduce the size and the associated costs of the battery. In our case, the battery can now operate at an average continuous rate (charge and discharge) of 300%. In the example above, a 1MWh system can now be met with a 350kWh battery; much smaller, much lighter, and much less costly to install, with only a \$35,000 budget needed (if the necessary costs were \$100/kWh).



Advanced technology: SPBES' patented CellCool™ liquid cooling system reduces risk and increases lifespan.

While the above model is not always accurate, it is more reflective in what we call power systems. In energy systems where a slower, more steady output of energy is required, size is totally dependent on capacity. Clients and operators will understand the concept that their vessels are operating underpower or energy requirements and where energy is the driver, we have engineered a battery system where we can simply use the same battery with all of the same components, but with cells that have higher energy density- so we can significantly reduce the footprint of the battery system.

Sustainability: A battery that can last for ten years is a pretty amazing thing, but it will never match the lifespan of the vessel itself. This equates to significant costs to replace a battery system every five or ten years on a vessel that will be

in service for up to 50 years. We took this challenge, and in analyzing a system, realized that while all components will require some maintenance, the most significant reason for ESS replacement was the fact the cells will age.

The answer to continuous replacement (and the capital costs associated with it) is a design that allows us to remove and renew the cells regularly, i.e. every 5 to 10 years. If we can keep the bulk of the infrastructure and safety systems in place, then we can reduce the cost of replacing the system to the cost of cell replacement and cell recycling. This radically reduces the total cost of operating an electric or hybrid vessel over its lifetime.

Cell Swap™ has been at the core of our design since 2015, with every module core (regardless of

chemistry of the cells) able to be replaced within 30 minutes. SPBES technicians can perform CellSwap refurbishment while the ship is running or in for maintenance. Cell swap means that the battery system life span is now the same as that of the vessel; it is similar to engine maintenance and rebuilds. With this inclusion, the design of the battery system is now in line with marine market requirements. Recycling will have an increasingly prominent role in decision making over the next generation. This is part of the benefit of a cell swap; we can safely support the recycling of the lithium cells and do this at a very low cost and impact of operational budgets. Part of our contracting now is to include end of life recycling with every system. While often overlooked, it is necessary for any company that uses ESS in commercial operations to include this operational expenditure in their impact analysis of utilizing energy storage systems in day to day application.

Where to next? I think that commercial needs are going to continue to drive improvements. Natural evolution of clean maritime propulsion with products such as fuel cells will significantly improve environmental impact and cost-effective operations. Organizations like the IMO and Class and Flag Authorities will continue to motivate us to move the technology forward in order to meet the needs not only of our industry, but those of society as well. We look forward to the challenges of the future and the next generation of developments to come.

ABOUT SPBES

SPBES designs and manufactures high power lithium-ion energy storage. Comprised of the most experienced team in the sector, SPBES is focused on providing value and safety for industrial, marine and grid energy storage applications. www.SPBES.com

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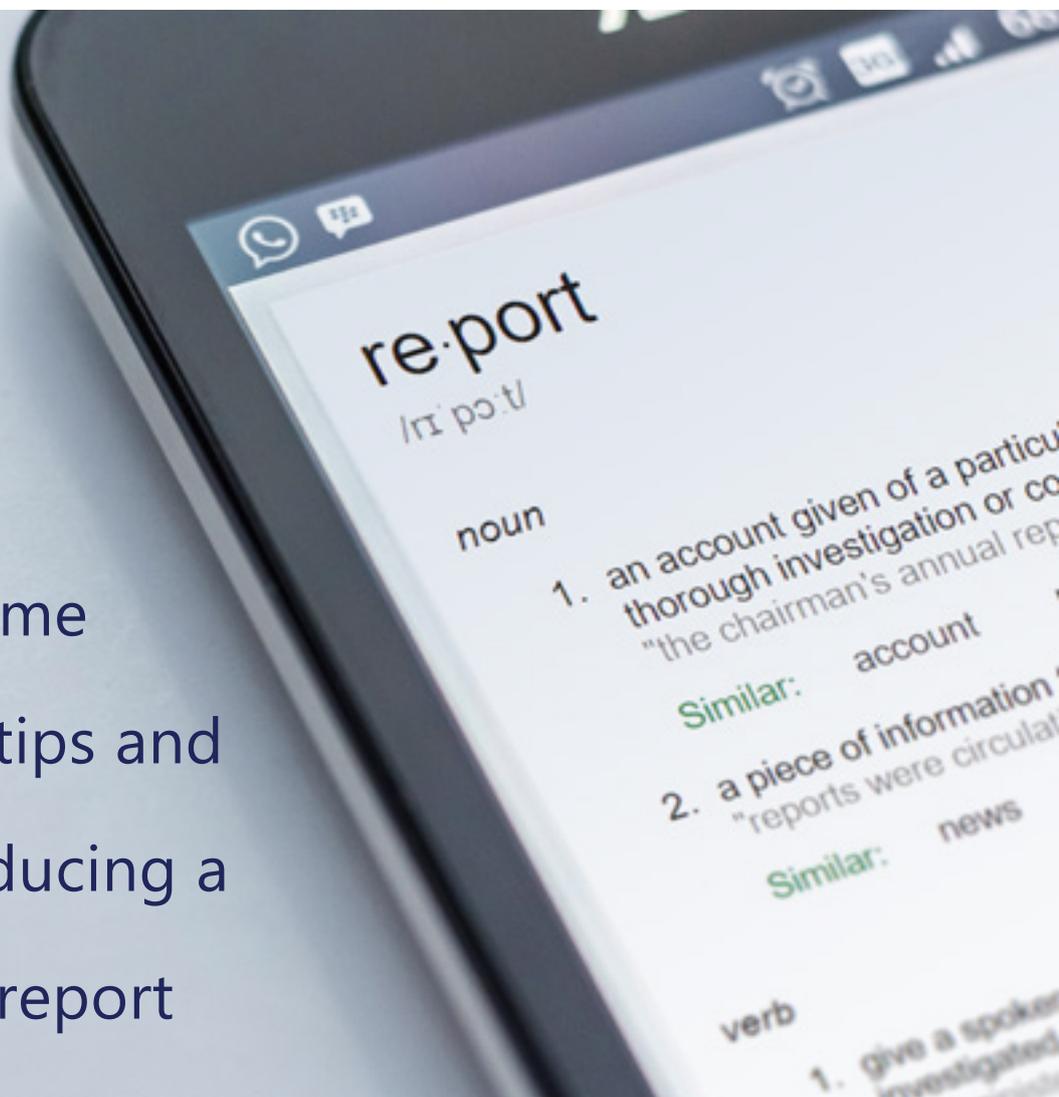
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Effective report writing

Introducing some non-technical tips and advice for producing a quality survey report



The Institute sees many reports, either as part of the application process when submitted by a potential new member or following a complaint that has been made against a yacht and small craft surveyor. In some cases, the report quality leaves a lot to be desired. For some surveyors, the actual composing of the report can be far more

daunting than conducting the survey itself. Quite often it is not the technical content of the report that is lacking which lets the surveyor down. Sometimes it is clear that technical knowledge has been displayed; rather it is his or her inability to write down and sum up the findings in an effective and professional manner that is at issue.

The aim of this article, which is based loosely on the content of the twice annually broadcast IIMS online Report Writing seminar, is to offer some practical hints and tips, including aspects you may have not considered before. And, although aimed at yacht and small craft surveyors primarily, many commercial ship surveyors may also find these 'softer' aspects of report writing worthy of consideration.

When you sit down to write your next, and future reports, always keep at the back of your mind this simple six-point checklist:

1. The report you are about to start is your intellectual property and brand, also your reputation relies on it; so write it at a time of the day when you know you produce your best creative work.
2. Before you submit this report is it the best it can be?
3. Does your report achieve its purpose and meet your client's original instruction?
4. Has it been written free of waffle in the past tense giving only the facts, has it been thoroughly proofread and is it professionally presented?
5. Have you included too many photos?
6. And finally, remember that this report may be the one you later have to defend in a court of law some years ahead. If so, are you able to do that?

Before we get into the report itself, how well do you understand your comfort zone and psychological state, for this will determine if you are in the right place to produce first-class work. For example, you may have travelled back for many hours after a survey; you feel tired and have had a glass of wine. That is almost certainly not the right time to start to write a report!

Ideally you need to be at ease and in control of your environment with low levels of anxiety and stress.

When you are in this zone, a steady level of performance is likely. But remember that familiarity and complacency can be dangerous too and, in this state, you may be prone to making errors, sometimes unwittingly, because you are in your comfort zone.

Stepping out of your comfort zone raises anxiety and generates a stress response. This results in an enhanced level of concentration and focus on what you are about to do. Consequently, your performance can be enhanced by some stress leading to a better report. Some examples of extra stress could be caused by:

- Looming deadlines
- Demanding clients
- Unfamiliar vessel types

SIMPLE DEFINITION OF A REPORT

A report is a written document, (not a photo gallery), produced for a clear purpose and to a particular audience. Specific information and evidence are presented, analysed and applied. The information is presented in a clearly structured format making use of sections and headings so that the information is easy to locate and follow.

When you are asked to write a report, you will have been given an instruction by your client. The instruction should outline the purpose, audience and problem, or issue that your report must address.

EXECUTIVE SUMMARY

Recommended at the start of your report is an executive summary, although some prefer to do this at the end. An executive summary is a short section within a document that summarises the longer report in such a way that readers can quickly become acquainted with the whole report without having to read it all.

It usually contains a brief statement of the content covered in the report, background information, concise analysis and main conclusions. It is intended as an aid to decision-making by busy people who may not read the whole report. Busy hull underwriters, for example, are known to turn straight to the summary page!

The art of precis is a skill that everyone will have been taught at school and has relevance when it comes to writing an executive summary. Your report should be just long enough to meet the client's expectations, but not a word longer than is necessary. Your executive summary is essentially a precis of the entire report. A precis is defined as a summary of something's main points, but with no loss of meaning.

This leads nicely into report lengths. The Institute's recommendation for a normal full condition or pre-purchase survey is it should run to perhaps 20 pages and a basic structural survey might make a dozen pages. If you have written considerably more then you have probably overstated the problems or have waffled or used flabby phrases

– more about them later. Simple short sentences are all you need so they cannot be misconstrued. And remember, your report will be written sometime later after the survey and therefore must always be written in the PAST tense.

As a general guideline, your report should reveal the facts and not give opinions. Understanding the difference between fact and opinion is a skill and opinions can often be wrong.

- A fact is described as the statement that can be verified or proved to be true. Opinion is an expression of judgment or belief about something.
- Fact relies on observation or research while opinion is based on assumption.
- Fact is an objective reality - opinion is a subjective statement.
- Facts can be verified with the help of evidence or statistics. Opinion is not supported by any evidence.
- Facts explain what actually happened unlike an opinion, which represents a perception about something.
- The fact is universal and does not differ from person to person. Every person has a different opinion on a subject and so will vary from one to another.
- Facts are shown with unbiased words; however, opinion is expressed with biased words.
- Facts can change anybody's opinion, but vice versa is not possible.

- Facts are real information that cannot be challenged or debated, but opinions can be debated.

THE NEED FOR CLARITY AND BEING SURE THAT YOUR CLIENT UNDERSTANDS YOUR STATEMENTS

Do not use jargon because your client might have a very limited understanding of vessels and scant technical knowledge. Be careful not to overstate or exaggerate, ensuring you give sufficient details and leave the client to decide their next course of action. Do not get involved in dealings between buyer and seller. That is the broker's job - leave them to it.

Consider this real statement, an example of vagueness that needs some clarity.

"My officials are monitoring this situation very closely, and I can promise we shall take all appropriate measures to ensure that the situation is resolved in a way that is fair to all the parties involved".

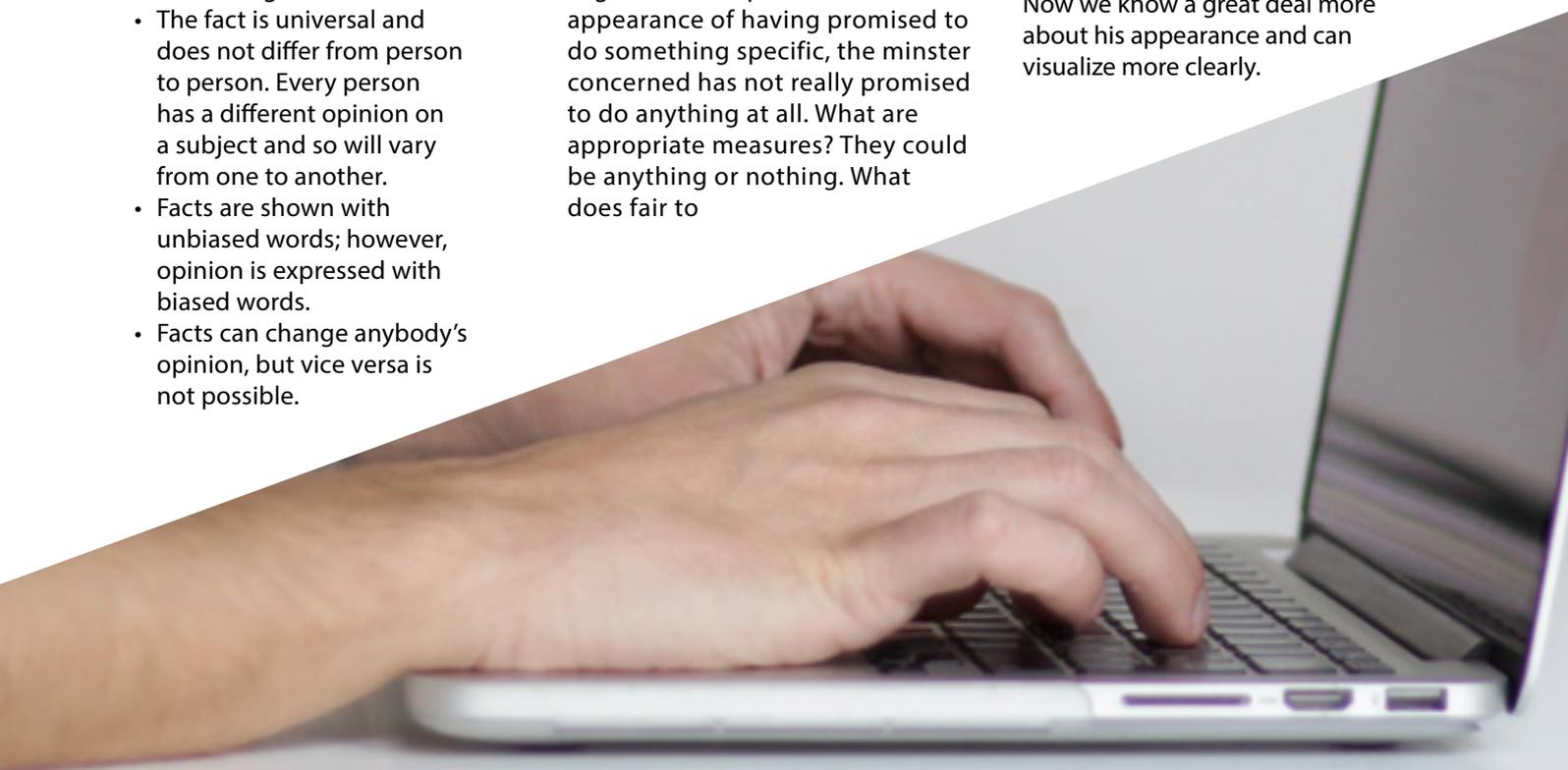
This statement should be challenged on grounds of vagueness. Despite the appearance of having promised to do something specific, the minister concerned has not really promised to do anything at all. What are appropriate measures? They could be anything or nothing. What does fair to

all the parties mean? Such phrases are vague, can be interpreted to mean almost anything and have no place in your report!

Sticking with vagueness, vague words and phrases can create wrong or confusing meanings in your client's mind. They state a general idea, but worryingly leave the precise meaning to your client's interpretation. The following examples show vague words and simple ways to make them specific:

- Very many: 17 or 103 are specific
- Early morning: 5am or 05.00 are clear
- Hot: 97 degrees Fahrenheit is clear
- Most: 89.9% is specific
- Soon: 6pm or 18.00 on Tuesday is certain

The use of descriptive words and phrases in your reports can greatly enhance its value. Study this example: "He was a small man" - only gives you a limited visual impression of the person, but this next phrase reveals much more about him with the use of a few extra descriptive words: "He was a diminutive, tattooed, brown eyed man, stocky in appearance with a rosy complexion." Now we know a great deal more about his appearance and can visualize more clearly.



PROOFREADING IS VITAL BUT IS A SPECIALIST SKILL

The need for proofreading cannot be underestimated. If a report is presented to a client with spelling and punctuation errors the document will be viewed far less favourably. In fact, it might be dismissed instantly out of hand. Accuracy with spelling, grammar and punctuation really matters. Before you click print or send the email with attachment, you must ensure your report has been proofread for errors as well as technical inaccuracies.

If proofreading is not a skill you possess then look for someone in your network who can help or employ a professional proofreader to check it over. You may not spot your own mistakes, but they will. Yes, it costs some money but could

save you a great deal in the long run and your reputation too. There is plenty of online proofreading software and a Google search will reveal what's available.

PRESENT AND SUPPLY YOUR REPORT PROFESSIONALLY

If supplied in hard copy spiral bind your report. Tempting though it may be, do not staple and do use a front and back cover.

Use normal type fonts and not fancy, hard to read ones. Popular serif fonts to be recommended are Times New Roman, Palatino, Georgia, Courier, Bookman and Garamond. There are others. A small font size makes reading hard. A minimum font size of 10 is suggested with a maximum of 12 point (depending on the typeface).

Emailed reports should be in locked pdf format only and not in word format. And if you do it well it will be the best and cheapest form of advertising you do, probably resulting in repeat business.

WHAT IF IT ALL GOES WRONG?

If your client is unhappy with the report - (and they have up to 6 years to bring a claim in the UK) - don't ignore the problem because rarely does it go away. You should plan to resolve the matter quickly before a complaint reaches IIMS, or even worse, the wounded client takes to social media to publicly criticise the surveyor, leaving his or her reputation in tatters. And yes, there is evidence of this happening. It is mandatory to contact your broker and/or insurer immediately to notify them of a potential claim and to seek advice. Talk to the client and consider mediation to come to an amicable conclusion. Remember, good 'customer service' goes a long way at this point. Effective and open communication coupled with politeness and professionalism is key to resolving issues.

Finally, hard though it may be to do, returning your fee is always a better, more palatable and cheaper option than facing lawyers and an angry client in court!

Normal, popular serif type fonts



- The boat was constructed of wood (Times New Roman)
- The boat was constructed of wood (Palatino Linotype)
 - The boat was constructed of wood (Georgia)
- The boat was constructed of wood (Bookman)

Fancy, hard to read type fonts



- *The boat was constructed of wood (Baskadder)*
 - *The boat was constructed of wood (French Script)*
 - *The boat was constructed of wood (Kunstler Script)*
- *The boat was constructed of wood (Rage Italic)*

Article written by Mike Schwarz

The next Report Writing Online Seminar is Thursday, 18/06/2020

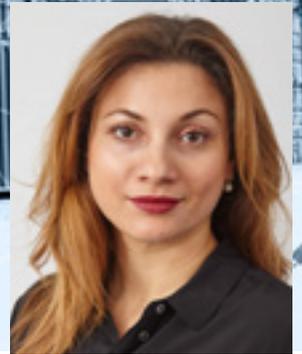
Examples of flabby phrases

It is important to master how to eliminate flabby expressions and phrases in a report, because doing so creates clarity. Flabby expressions are the extra words that prevent the writer's content from being clear and concise. Sometimes it only takes one word. These handful of examples demonstrate the technique.



Flabby phrase	Flabby phrase in context	Better to say...
Absolutely essential.	A new mast is absolutely essential.	Better to say a new mast is essential.
Careful scrutiny.	The lawyer read the document with careful scrutiny.	Better to say the lawyer scrutinized the document.
Completely engulfed.	Flames completely engulfed the house.	Better to say flames engulfed the house.
Depreciate in value.	Assets depreciate in value as each year passes.	Better to say assets depreciate as each year passes.
During the course.	The forecast will change during the course of the day.	Better to say the forecast will change during the day.
Emergency situation.	We have an emergency situation at the yard.	Better to say we have an emergency at the yard.
Filled to capacity.	The water tank was filled to capacity.	Better to say the water tank was filled.
First and foremost.	He remains first and foremost a small craft marine surveyor.	Better to say he remains foremost a small craft marine surveyor.
Foreign imports.	It is thought foreign imports hurt our country's economy.	Better to say it is thought that imports hurt our country's economy.
General public.	The portable toilets are for the general public.	Better to say the portable toilets are for the public.
Hollow tube.	He slid down the hollow tube at the water park.	Better to say he slid down the tube at the water park.
Integrate with each other.	The two systems must integrate with each other.	Better to say the two systems must integrate.
Joint collaboration.	The joint collaboration between governments failed.	Better to say the collaboration between governments failed.
Knowledgeable expert.	She's a knowledgeable expert in her field.	Better to say she's an expert in her field.
Major breakthrough.	The invention was a major breakthrough in nuclear technology.	Better to say the invention was a breakthrough in nuclear technology.
New innovation.	It was a new innovation to social media.	Better to say it was an innovation to social media.
Now pending.	Our request is now pending.	Better to say our request is pending.
Past experience.	My past experiences are what made me who I am today.	Better to say my experiences are what made me who I am today.
Postpone until later.	You should postpone your appointment until later.	Better to say you should postpone your appointment.
Serious danger.	You're in serious danger.	Better to say you're in danger.
Still remains.	Even after all the bombing raids, the building still remains.	Better to say even after all the bombing raids, the building remains.
Surrounded on all sides.	They were surrounded on all sides by enemies.	Better to say they were surrounded by enemies.
Two equal halves.	Cut the fruit in two equal halves.	Better to say cut the fruit in halves.

INNOVATION



By **Dr. HANANE BECHA**,
PhD COMPUTER SCIENCES

The UN/CEFACT Smart Container Project

Dr. Hanane Becha is a key member of TRAXENS, defining the Standards Strategy enabling smart containers. Hanane has received a Ph.D. and an M.Sc. in Computer Science from the University of Ottawa, as well as a B.Sc. from l'Université du Québec en Outaouais. She is currently the project leader of the smart container initiative at the UN/CEFACT under the Transport and Logistics Domain.

Hanane has extensive experience in standards development. She worked for the Nortel Strategic Standards development team between 2006 and 2009, leading the creation of Nortel-wide standards strategy for SOA and Web Services and actively participating in the development of SOA related standards and specifications. She focused on identifying and filling gaps

in standards for using SOA principles in mission critical applications. Hanane led the Object Management Group (OMG) Telecom Special Interest Group initiative. She is the editor of multiple documents at the International Telecommunications Union, Standardization Sector (ITU-T) which deal mainly with "IPTV Services Requirements", "Open Service Environment

capabilities for NGN", and "Ubiquitous Sensors Networks".

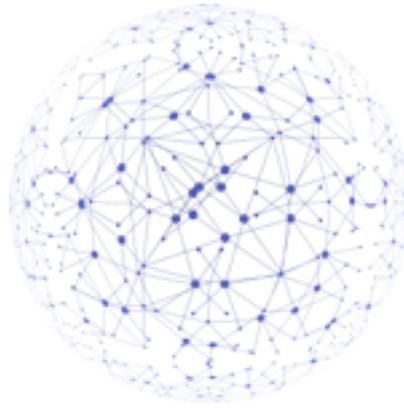
She has published a number of articles related to SOA, QoS, and Distributed Computing. Hanane also taught several courses at the University of Ottawa and Aix Marseille University and has published a number of scientific articles related to SOA, WS, Ontologies and QoS.

The word 'smart' is much used in today's world and sometimes glibly. Let's face it, we have smart watches, smart refrigerators, smart televisions and the obligatory smart phone of course. So why not smart containers? IIMS is always keen to delve into coming technologies and the developments going on behind the scenes to deliver the smart container project are fascinating. So, if you are a self-confessed dinosaur, prepare for a tough read ahead! Dr. Hanane Becha takes up the story.

Complex supply chains inherently involve many different intermediaries as they move goods from point A to point B. Each party's processes have been developed to achieve specific objectives within its role in the intermodal supply chain, creating multiple perspectives and information "silos." As a result, no single party has complete door-to-door visibility of cargo during transport. This fact leaves many opportunities for errors and communication gaps—making it difficult to answer real-time questions and enable fully informed decisions.

The Ideal Real Time Insight Ideally, real-time data can be integrated directly into stakeholders' risk analysis and decision-making processes. This is where the UN/CEFACT Smart Container project adds so much value to the industry. The Smart Container project goal is to define data elements generated from smart containers and to develop a data model that will enable development of Smart Container Application Programming Interfaces (APIs).

A preliminary white paper published in December 2018, provides a detailed look at the benefits of using Smart Containers and potential use cases. Smart Container Business Requirements Specifications (BRS) were released in September 2019, providing an official global standard that includes detailed value propositions for multiple smart container use cases focused on data inputs, outputs, values, and formats.



Data elements have been defined and a Smart Container Standard Data Model is being finalized. The data model defines communication semantics—consistent meanings regardless of context—ensuring all stakeholders interpret data the same way. Syntax rules specify the correct combined sequence of symbols that can be used to form a correctly structured program in a given programming language. Both are essential foundational elements for developing smart container standard APIs. The UN/CEFACT Core Components Library is a huge catalogue of semantic definitions for business data that can be reused across multiple business sectors. The library is extensible and continuously evolves to meet changing needs of buy/ship/pay process stakeholders.

The next step is defining APIs—agreed-upon data flows with syntax and semantics that enable stakeholders to connect and invoke third-party services in their business process workflows. APIs are the glue between different services that enable this integration. With standard APIs available to the industry, stakeholders will benefit from an explosion of new capabilities for connecting and integrating data across the intermodal supply chain ecosystem.

API Development via the Smart Container Project

An API is a source code-based specification that allows different software components—or services—to communicate with each other. APIs can be created in

any chosen syntax. Traditionally, APIs were developed from scratch for specific integrations and languages. Today however, APIs are increasingly used to integrate various turnkey services and data sources for the purpose of enriching or augmenting existing business processes and workflows.

A turnkey service is like a black box. The service contains everything it needs and defines the service inputs, outputs, and required semantics. The service description should communicate what happens when the service is invoked and identify the conditions for using the service. There is no need for the stakeholder to understand or to master the logic behind the service.

With APIs as the "glue" between multiple turnkey services and data sources, adding business process capabilities can become agile, cost-efficient plug-and-play exercises. APIs not only enable powerful new data services and applications; they simplify continuous adaptation to changing business requirements.

In a step-by-step methodology, the Smart Container project is using defined data elements' semantic and syntactic descriptions to develop the functional behaviour of API operations:

Step 1: Identify stakeholders and smart container services that could enhance their business processes. Clear value propositions are described based on Smart Container data scoping different services. The UN/CEFACT white paper promotes smart container adoption by providing use cases for decision makers across the supply chain ecosystem and answering questions like "what is in it for me? Why should I care?" This step is complete.

Step 2: Derive smart container-transmitted data elements based on use cases. Some of these data elements, such as "consignor" and "consignee" are already part of the Core Components Library. Other data elements are new, such as different smart container

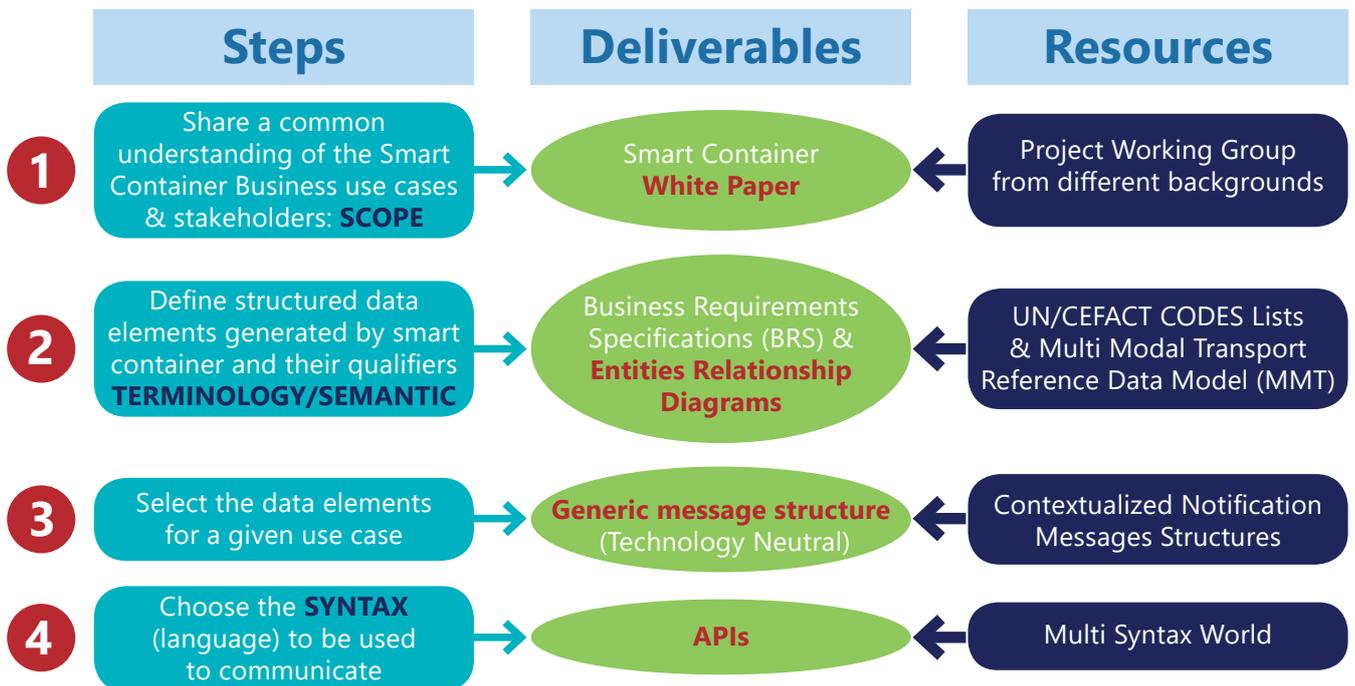
physical measurements and parameters. In addition to the periodic measurements, new data elements also include inputs such as expected physical values or trip plan descriptions that enable the smart container solution provider to generate alerts and predictive values, like Estimated Time of Arrival (ETA). The Library provides clear semantic data exchange standards, so all stakeholders understand the same data element in the same way. The deliverable is the Smart Container Business Requirements Specifications (BRS). This step is complete.

Step 3: Select required data elements from the Library for the smart container project and define semantics for all new generated data elements and their relationships. This includes creating semantics for business definitions and data structures. The deliverable will be a data model and associated schema based on the UN/CEFACT Multi-Modal Transport Reference Data Model, which is a subset of the Core Components Library. This step is in progress.

Step 4: Select a subset of data to define a contextualized message structure to meet the requirements of a given use case. The message structure is technology-agnostic - independent of the technology used to communicate the data. This step is in progress.

Step 5: Define the message from the syntax point of view using a chosen technology, which will result in API definitions based on standardized data elements. This step is planned.

Figure 1: UN/CEFACT Smart Container Methodology. From data elements to APIs definition



The UN/CEFACT Smart Container project is a collaborative initiative comprised of volunteer experts (over 50) from intergovernmental organizations, individual countries' authorities, and the business community. Adoption of UN/CEFACT standards is entirely voluntary.

Envisioning the State of the Art
Today, there is a need for a clear

data exchange standard to enhance the collaboration between multiple stakeholders that are involved in the information linked to a single smart container.

Hence, stakeholders are increasingly reluctant to adopt proprietary standards and risk being locked into one solution provider. Agreed-upon API standards enable stakeholders to

adopt the services of their choice and add or change providers as their business needs require—without the fear of obsolescence, high support costs for legacy technology, or inability to meet customers' needs. Without defined standards, Smart Container solution providers will have to develop their own interfaces to each stakeholder, adding cost and slowing time to market.

The Smart Container project aims to create the state of the art in providing and exposing services that can be orchestrated and enriched to meet business process needs of any intermodal ecosystem stakeholder. The availability and exposition of these services can boost the digital transformation of the transportation and logistics industry, fuelling innovation in applications and services.

For more information, contact Hanane Becha, UN/CEFACT Smart Container Project Lead, at h.becha@traxens.com or visit <https://www.traxens.com>

The Danger of Mold in the Marine Environment



by **Michael A. Pinto,**
CSP, SMS, CMP, CFO, FLS
Wonder Makers
Environmental

Critical Information Surveyors Need to Know

Introduction

Any surveyor who does not know by now needs to understand that evidence is mounting for mold growth in the marine environment and is more than just unsightly or smelly. The scientific and medical evidence is now clear that mold exposure, particularly in confined spaces (such as cabins and below deck areas on ships), poses a health threat to occupants (See figure 1). As such, potential mold contamination should be identified during vessel surveys.

For a marine surveyor to be able to include potential mold contamination as part of their survey, having a solid grasp of some basic information is essential. It starts with the science. Mold is a subset of the fungi kingdom; which also includes yeast, mushrooms, and a number of other plant parasites. What all these organisms have in common with mold is that they produce spores as their reproductive mechanism and do not need light to grow. Since fungal spores, particularly mold, are all around us from their natural growth/dispersion process, all they need to grow in a vessel is a moisture source, some nutrients,

and the right temperature.

Although mold has a bad reputation in regards to contamination inside vessels, it is absolutely critical to the proper functioning of the world, as fungal organisms are the primary decomposers of plant matter. Without mold and other fungal organisms, nutrients would not be returned to the earth to allow continued life. Despite this positive attribute in an outdoor setting, problems arise when mold grows where it is not wanted, such as inside vessels.

There is an incredible diversity in the fungal kingdom with over 30,000 identified species of mold. These range from surface molds (those that extract nutrients from the outer layers of materials) to rot molds (which produce more aggressive enzymes and break down the structural integrity of plant-based materials). While wood, plywood, paper, and fabrics of natural fibers are principal food sources for mold, they also flourish on glues, mastics, and even plastics. Since they do not need light as an energy source for growth, mold often colonizes in dark and damp

spaces (under carpet, behind wallpaper, or drywall), and in difficult to reach spaces such as engine compartments and bilges (See figure 2).

Overview of Potential Health Effects

Of the thousands of recognized mold types, few are considered to be “toxic” (a term that is used much too loosely in many conversations about mold), but all can cause problems depending on conditions. The primary problem is that many of the spores and ancillary components of mold are known *allergens* or *asthmagens*; materials that trigger allergic responses or an asthma attack. Some molds can cause additional health effects because they produce *mycotoxins* (poisonous chemicals). To add to the seriousness, a variety of chemical compounds produced by molds are known carcinogens which are typically found inside vessels.

Under the right conditions (particularly with individuals who have compromised immune systems), some molds can actually grow inside the human body as a fungal infection. Such infections



are some of the most difficult for the medical community to deal with because the range of medicinal options for fungal infections is much more limited than the variety of treatments available for bacterial infections.

Since mold is a naturally occurring organism which has so many different variants, there currently is no recognized Workplace Exposure Limit (WEL). However, this lack of government mandated controls does not mean that marine surveyors can be cavalier about potential exposure to themselves or vessel occupants. What is clear is that breathing in too many spores, on either a short-term or long-term basis, can lead to real problems. Medical studies over the last decade have indicated that individual genetic factors play a large role in an individual's ability to tolerate mold exposure. Therefore, individual susceptibility is considered to be both dose and genetic-related. A worst-case exposure to mold can lead to sensitization and the development of a serious disease known as *Chronic Inflammatory Response Syndrome* (CIRS). Although the medical sciences have come a long way in being able to diagnose and treat mold-related problems, the obvious answer is to avoid exposure so that a health problem does not develop.

Identifying Mold Contamination on Marine Vessels

The key to avoiding mold-related health problems is to have an awareness of the situation and address possible fungal contamination in vessels prior to occupant exposure. This can be challenging, because wherever a water source is available and temperatures are favorable, mold growth is a possibility. This possibility turns into a probability in a number of common situations encountered by marine surveyors. One of the most common scenarios includes the investigation of boats that have been in storage with shrink-wrap protective covers (See

figure 3). During other inspections, specific areas of the vessel are more likely to have areas of fungal contamination and should command special attention from the surveyor. These areas include bilges, the head, HVAC ductwork, closets, areas with fabric-covered contents or wall coverings, and small spaces such as storage cabinets (See figure 4).

Even with an understanding of how mold grows and where it is most commonly found on vessels, it can still be difficult to distinguish mold growth from diesel exhaust residue, grease smears, and general deposition of dust (See figure 5). Although the first step in identifying mold contamination during a marine survey is the visual assessment, documenting the presence of odors is also a key component of any investigation. Despite the myriad types of mold (and hundreds of identified volatile organic compounds that can be produced by growing mold depending on the fungal type and nutrient source), mold odors are unique enough that they are quickly identifiable by most people. Indeed, it is hard to describe mold scents without using the word 'mold' because the smells are so closely associated with damp spaces supporting fungal colonies. Fortunately, mold odors are strong enough that people identify them before the dangerous compounds produced from the mold growth reach levels that are considered dangerous from an occupational standpoint.

Even when the visual and olfactory assessment confirms mold growth or deposition of mold spores on surfaces from active colonies, sampling is still necessary. The individual spores are so small that they cannot be seen without magnification. Because of this, air or surface samples are frequently used to supplement visual inspections for mold. While there is a large variety of equipment and techniques that could be used to assist the marine surveyor, the simplest approach is to use a "bio-

tape" to collect surface samples in suspect areas (See figure 6). Such samples can quickly be taken of suspected visual colonies to confirm actual mold growth or of dust on surfaces in adjacent areas to determine if mold spores have spread beyond the area of immediate growth.

Proper collection of samples must be matched with good documentation and proper analysis. However, the collection, documentation, and analysis are only useful to the client if proper interpretation of the results is offered. Currently, the mold investigation and remediation industry are polarized with people who are irrationally afraid of a single spore (sometimes referred

to as *fungiphobics*) on one side and *mold minimizers* on the other who disregard any contention that mold can be harmful. Obviously, the truth is in the middle of those two extremes. That is why it is important that marine surveyors rely on qualified professionals who know both the marine industry and mold remediation to help them interpret the results*.

Addressing Mold Contamination

Getting your priorities straight is important for any endeavor. Marine surveyors who become knowledgeable about mold on vessels understand that the best approach can be summed up by a simple three-step mantra:



Figure 4



Figure 5

1. Protect the surveyor
2. Protect the vessel occupants
3. Protect the vessel

Any marine surveyor who enters a confined part of a vessel and encounters strong odors that appeared to be mold-related should back out and determine if the area can be ventilated before re-entry. If that is not the case, then prudence demands that the surveyor use appropriate respiratory protection; such as a filtering face piece rated as

N-95 or higher (the author prefers the N-100). Such a precaution may seem extreme to surveyors who have never utilized such precautionary measures in the past. However, it is important to note that single intense exposures to fungal contamination which causes serious health effects are so common that it has its own medical description: organic dust toxic syndrome.

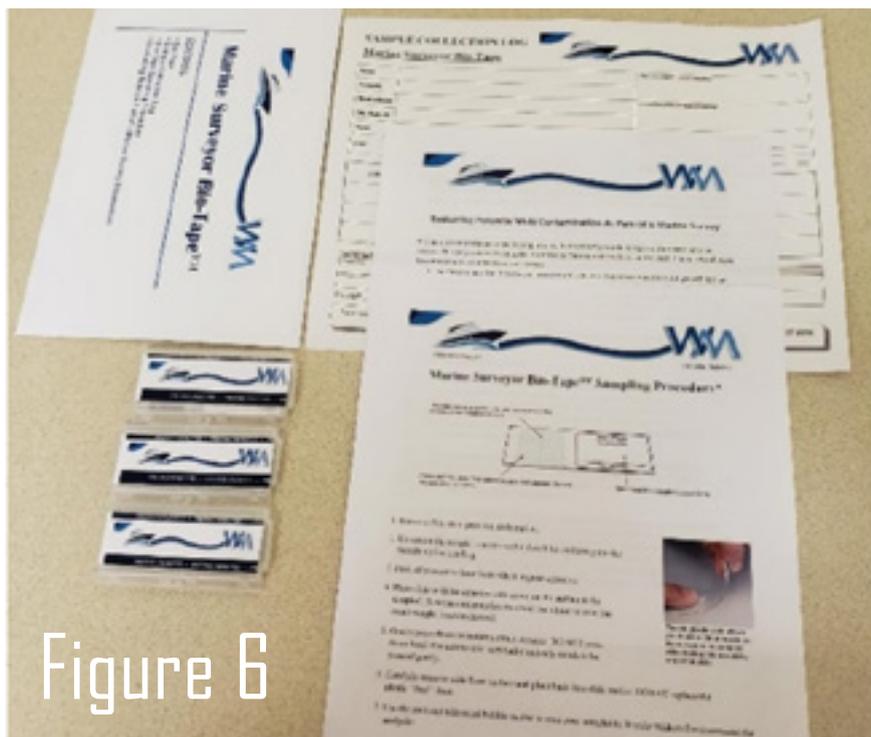
Seeing evidence of mold contamination and not reporting

that finding on the marine survey can leave the occupants at risk. Even if the surveyor was not adversely impacted by the contamination during their time of the vessel in the long-term, low-level exposures can also lead to serious problems. This means that those who later occupy the vessel can develop serious health problems, particularly since the surveyor does not typically know the health status or genetic makeup of future occupants. Regardless of whether a surveyor wants to offer sample collection services related to mold as an optional part of their inspection, documentation of any potential visual or olfactory contamination is crucial in providing a comprehensive investigative service.

Surveyors Do Not Make The News. They Just Report It.

By this point, some marine surveyors may be thinking: "No way. If I tell them that there is possible mold contamination or take samples, I will never get another job again. No one likes it when you bring them problems." In contrast, professional surveyors know that they have an obligation to report their findings accurately and honestly. Even though mold contamination on boats have not been a common topic of discussion, or a detailed investigation was conducted in the past, this does not mean that the surveyor is increasing their liability by becoming knowledgeable of this important subject and sharing that knowledge with their customers.

From a liability standpoint, identifying potential problems and encouraging the customer to engage qualified professionals to address the issue is the best way for the surveyor to protect themselves from post-inspection disputes. With the simple tests that are now available to either support or disprove the initial suspicion of fungal contamination in a boat, adding that service as an option to a standard vessel survey makes business and legal responsibility sense.



Indeed, marine surveyors have a duty to understand the basics about mold. Beyond that, they have an obligation to document its presence if seen. More importantly, the marine surveyor can be a bridge from the customer to professionals qualified to help.

Help For Addressing Mold Contamination on Vessels is Available

In addition to knowing the basics of identifying and documenting mold contamination on boats, the marine surveyor needs enough knowledge of mold remediation basics to be able to make appropriate referrals. Just like marine surveyors have their own technical terms for describing parts of the vessels and observed conditions, so does the mold remediation professionals.

At a minimum, marine surveyors should be aware that mold test results often lead to the classification of the situation into one of three categories. Condition 1 is defined as “normal fungal ecology.” This term is utilized because mold is a naturally occurring organisms that can be found in the air around the world. Indeed, some mold spores and other pieces of the fungal colonies are typically recovered from almost every sample. Since zero mold spores is not a threshold that defines a problem, the term ‘normal fungal ecology’ is utilized to indicate that the type and quantity of spores should not pose any structural or health issues.

Just as Condition 1 indicates that there generally is not a mold-related problem, Condition 3 is the term utilized to designate problem areas. Condition 3 indicates that there is visible mold growth in a particular part of the structure or vessel. Interestingly, the definition of Condition 3 includes mold growth that may be hidden but would be visible if it was accessible. For instance, mold growing between the deck and hull of the boat that cannot be accessed without removing materials or cutting an inspection hole would still fit the definition of Condition

3 (See Figure 7). Many times, such hidden fungal growth is identified by the odors or through the use of inspection cameras or mirrors.

With Condition 1 representing a normal environment and Condition 3 representing identified problems, it is logical that Condition 2 is the term used for secondary contamination. The spores that are dispersed by fungal colonies eventually land somewhere. Generally, more spores settle closer to the source of the contamination than farther away. When a significant quantity of spores is deposited on surfaces from a Condition 3 contamination, it is described as Condition 2 or “settled spores.” This can be the trickiest type of contamination to identify during the survey because a fungal source growing on the coils of the air-conditioning system can push contamination into all of the enclosed areas of the boat. Understanding the importance of identifying Condition 2 areas is why marine surveyors often take surface samples throughout a vessel when contamination is seen or suspected on the HVAC coils, supply vents, or return grills.

Once a problem is identified, it can be quickly categorized with appropriate sampling data. Proper remediation involves the removal of source materials (Condition 3) and appropriate cleaning of all Condition 2 areas. Since the marine environment is conducive to fungal growth, the best remediation services will also offer the option of providing preventative treatments once the fungal growth has been appropriately removed and cleaned. A variety of chemistries and techniques are currently available to efficiently and safely address mold contamination problems.

Marine Surveyors Need to Lead the Way

There is no doubt that the marine environment creates unique challenges to identifying and correcting problems related to mold growth on ships. By their very design, the marine vessels operate

in a wet environment. This means that the moisture to support fungal growth can be just inches away and only separated by plywood and fiberglass. Boats designers have become creative in using every square inch; meaning that there are lots of small spaces which are hard to access. The tremendous variety of materials (both porous and water resistant) used on boats also provides multiple nutrient sources for the development of mold colonies. Finally, the process of storing boats wrapped moisture tight for extended periods of time means that the fungal colonies can proliferate before being discovered.

Despite these challenges, marine surveyors need to be knowledgeable and objective; inspectors who understand the potential problems that mold growth presents on vessels. Sharing this information with the customer in a balanced and informative way separates the professional surveyor from the amateur.

*One organization is currently focused on offering such specialized services to the marine industry. After seeing the need, Wonder Makers partnered with RGS to provide a customized program of mold sample collection, documentation, analysis, and interpretation to meet the needs of the marine surveyors’ industry. More information is available about the services by following the link to: www.marinemold.com.

About The Author

Michael A. Pinto is one of the founders of Wonder Makers Environmental. This US-based firm provides assistance with identifying and resolving problems related to indoor environments. Mr. Pinto holds international credentials as a Certified Safety Professional, Safety Management Specialist, Certified Mold Professional, and Fire Loss Specialist. Michael authored the first comprehensive textbook on mold remediation and has been involved in the development of numerous documents that are part of the standard of care for mold industry. He can be reached at info@wondermakers.com



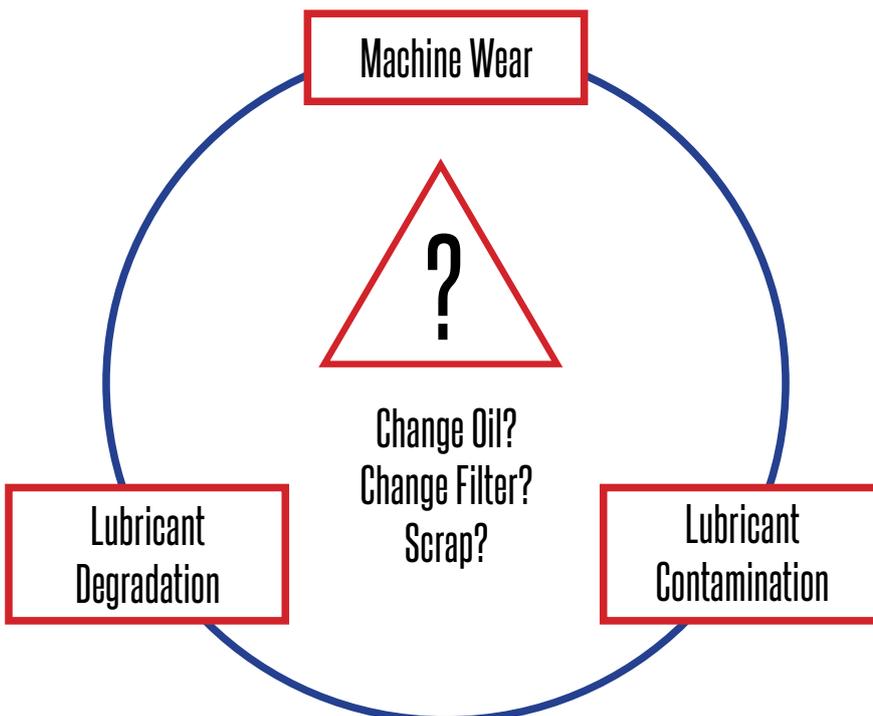
LUBRICANT SAMPLING, ANALYSIS & TEST IN PREDICTIVE MAINTENANCE

Used oil analysis is the bottom line for a successful maintenance strategy. Lubricants are the lifeblood of all machinery and an essential element of predictive maintenance technologies and may be described as a blood test for the machinery. In service oil sampling, analysis and testing can provide, *inter alia*, trace information about machine wear conditions, lubricant

contamination and general condition. See the Figure below. Diagnostic and maintenance engineers, using oil test analysis results, can make important maintenance decisions among which are the immediate benefits of avoiding the mixing of oils, contamination control, condition based maintenance and failure prediction.



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Chairman of the Institution of
Diagnostic Engineers



Lubricating Oil Analysis and Choice Diagram

Machine condition monitoring and/or predictive maintenance is the practice of assessing a machine's condition by periodically gathering data on key machine health indicators to determine when to schedule overhaul and maintenance. One of the keys to keeping machinery operating at optimal performance involves monitoring and analysing lubricant oils for characteristics such as

contamination, chemical content and viscosity. A vast amount of money is spent annually replacing machinery components that have worn out due to the inability of the lubricants to perform their required task. Knowing how to interpret changing lubricant properties is the task of the diagnostic and maintenance engineer and can increase both the working time and the life of often highly critical capital equipment. The existence or amount of debris and particles from wearing parts, corrosion, erosion and contamination, provide clear information about the issues affecting performance and reliability. Lubricant and other key fluid analyses provide critical early warning information indicative of machine failure. Analysing and trending the data means maintenance can be

scheduled before a critical failure occurs. The result of such good practice is higher equipment availability and productivity, lower maintenance costs, lower total cost of ownership, less downtime, optimal equipment performance and a greener operation.

Common In Service Oil Analysis Techniques

The author's experience has been confined to the marine field but this paper, although marine orientated, applies equally well to land-based machinery.

The table below shows typical oil analysis parameters and common analytical techniques to monitor machine wear, contamination and degradation.

It is always good practice to advise relevant personnel to require oil samples to get an idea of the status of wear on machinery. If the person accepts that advice, the diagnostic or maintenance engineer should further advise his client, he has a subject clause his next moves of "subject to a favourable oil analysis". Should he not avail himself of such advice the engineer will have closed off any avenue of legal action against himself.

Any machine is kept running smoothly by the addition to the sump of lubricating oil. This is pumped around inside the engine by means of an oil pump which is usually mechanically driven and inside the sump and the oil passes through a filter, over every bearing and down each cylinder wall. The oil is kept at a reasonable working temperature by-passing through a heat exchanger which is often fitted in tandem with the cylinder jacket water heat exchanger. The actual arrangement varies from engine type to engine type and from manufacturer to manufacturer. By-passing through the engine in this manner the oil takes into a loose solution of tiny particles of wear metal from the bearings and combustion particles from the cylinders. In carrying out a full survey on any machine, the diagnostic engineer should, when he is looking at the engine, check and report on the condition of the lubricating oil. The nature of the contamination or any effects it may have had on the engine cannot be accurately determined by this method but carrying out this test will certainly give the engineer confidence in suggesting that a detailed chemical analysis of the oil be made, and any recommendations of the analysing laboratory be accepted.

There are two main reasons for removing oil from service, and they are respectively:

1. pollution from outside sources, and
2. oxidation causing deterioration of the oil itself.

Key oil analysis parameters and corresponding analytical techniques

CATEGORY	KEY ANALYSIS	ANALYTICAL TECHNIQUES
Machine wear	Fine wear metal elements	Rotating Disc Electrode (RDE) Spectroscopy, Inductive Coupling Plasma (ICP) Spectroscopy
	Large wear metal elements	Rotrode Filtration Spectroscopy (RFS), FPQ, XRF
	Particle count and distribution	Particle count, Laser Net Fines (LNF)
	Wear particle shape analysis	LNF, Ferrography, Wear Debris Analysis (WDA)
Contamination	Sand and Dirt	Particle count, Laser Net Fines (LNF)
	Fuel Dilution	Fuel Sniffer, Gas Chromatography (GC)
	Water/Moisture	Infrared (IR), Karl Fischer Titration (KF)
	Glycol/Coolant	Infrared Spectroscopy
	Soot	Sootmeter, Ir
	Alien Fluid	IR

High water content is possibly an exception. On some plants it would be removed simply by centrifuging the oil, but such a process is not usually available on smaller installations and, if excess water is found, the diagnostic and maintenance engineer should at least suggest that the oil should be changed. For detergent oils, a third reason for changing the oil may be added in *i.e.* a high insolubles content as that causes a depletion of the detergent additive.

Oil samples should be taken and analysed annually and at least three samples should be taken at each investigation; one either side of the filter and a minimum of one from the machine's sump.

Lubricating oil analysis (LOA) is the laboratory analysis of a lubricant's properties, suspended contaminants and wear debris. It is a quick non-destructive method of gauging the health of an engine by taking a close, specialised look at what is in the oil and should be performed as part of a routine preventative maintenance scheme to provide meaningful and accurate information on the lubricant and machine condition. By tracking oil analysis sample results over the life of a particular machine, trends can be established which can help eliminate costly repairs and down time.

The diagnostic or maintenance engineer should be aware, however, that receiving a warning from a single sample is not necessarily indicative of a machine performance issue and he should know that it's extremely important to examine all test results from a given sample in order to be able to decide what is happening. An acid number (AN) test, for example, may give off a warning but, by itself, that does not provide any meaning full insight into how the machine under test may be performing. The engineer needs to consider the relevance of the test when making any maintenance decision and, in relative importance, he should also consider viscosity, oxidation, nitration, the presence of wear metals and the base number (BN) in order to truly understand whether or not the lubricant is performing as well as it should. Reliance on one factor such as the acid number may well lead to erroneous results. It does not mean that the lubricant is underperforming. Consistent monitoring of the complete analysis results trend over time are, therefore, essential and become an effective tool to enable him to understand what is happening inside the machine. As another example, when a series of particular compression ignition engines were tested over a long period, a consistent warning was found on copper wear metal. Investigation showed, however, that a number

of the engines had undergone significant design and component changes. It was agreed, therefore, that the testing programme had to adapt to changes that affected the limits applied in order properly confirm the actual engine condition. That showed that a single copper warning did not necessarily indicate a performance issue and that the trend over time needed to be considered to see if the copper wear figures increased in the studied period.

When the diagnostic or maintenance engineer is analysing the results of a used oil sample, as well as the metallurgy of the machine's components, he should also consider the chemical formulation of the lubricant itself. Occasionally, the lubricant's own components may give warning signs for certain tests. For example, some oils are formulated with zinc based additives which may indicate that metal wear test results including copper tests to seem abnormally high. If such a result appears, then the analyst and engineers should make a more detailed study to see whether the copper is actually entering the lubrication system or whether components in the oil are the direct cause of the warning.

Perhaps the worst major challenge for a number of industrial machines is the presence of water. As a result,





it is usual to look for water with a special test. On site, a simple hot plate or crackle test may be used but in a lab the Karl Fischer test is applied. The crackle test only tells the investigator that water is present but not by how much. The Karl Fischer test gives the investigator the quantity in a given sample and so provides more insight into how badly the lubricant is suffering from too much water. It is good practice to carry out a crackle test on site before taking a sample to the lab for a full, in depth Karl Fischer test.

Lubricating Oil On-site Tests

The diagnostic or maintenance engineer should pull out the dipstick and check that there is sufficient oil in the sump by reading the oil level against the marks thereon. It should be noted that lubricating oil in a compression ignition engine is always black and, in a petrol engine, a dull yellowy-brown colour. He can then make some simple on site

tests to check the quality of the lubricating oil in the sump. There are three of these tests:

- the feel test.
- the drop test.
- the crackle test.

The Feel Test: For this test, he should rub the sample on the end of the dipstick between thumb and forefinger. The oil should feel smooth to the touch. If there is anything wrong with the lubricating oil this will be instantly discovered as it then will feel gritty.

The Drop Test: If he feels this grittiness between his thumb and fore finger, the diagnostic or maintenance engineer should then see if the oil requires further analysis by making a simple drop or dispersions test. The drop test provides quick and accurate visual confirmation that it is time to change a lubricant. Further, if the results of such a test are compared at regular intervals, oil change

cycles can be determined for the particular engine, brand of oil and their use, all of which affect oil degradation. This test is carried out by stretching a filter paper tightly over the top of a convenient tin or other receptacle and held in place by means of an elastic band and then dropping a blob of the oil onto the filter paper and leaving it to spread. Over a short period of time, the oil slowly spreads out over the surface of the paper and drips through leaving any contamination behind as a series of coloured, concentric rings. A fresh sample of oil should be dropped onto the paper at the same time as the sample being tested for comparison purposes. The procedure is simple:

- Withdraw the engine or gearbox dipstick and allow a generous drop to form on the end. Deposit the oil drop on the test sheet by lightly touching the end of the dipstick on the medium.
- Leave the test sheet in a horizontal position for a few minutes and then compare the sample to a sample of clean unused oil similarly treated.
- Backlighting samples enhances the sample results. This is done by simply holding the sheet up to a light or the sky.

The crackle Test: This test has been used as a reliable indicator of emulsified water, a go/no-go test. However, with practice and keen eyes and ears, the procedure can be advanced considerably and made more quantitative. Rather than simply listening for the crackle (which is due to scintillation), by adding visual observation of vapour bubbles, a rough indication of the amount of moisture present can be obtained. The revised method is referred to as the visual crackle. Success in using the procedure depends on practice with varying moisture concentrations in different common fluids. A laboratory syringe and a paint shaker can help create the experimental suspensions. While

the visual crackle does not replace the need for other more precise techniques, it does provide vital information when and where it is needed. Simple, inexpensive on site tests such as this can make a real difference in the effectiveness of oil analysis and contamination control.

The hot plate crackle test is a simple test to identify the presence of free and emulsified water suspended in the oil, provided a few simple rules are followed.

1. Raise the hot plate temperature to 320°F (160°C). Always use the same temperature.
2. Violently agitate the oil sample to achieve an homogenous suspension of water in the oil.
3. Using a clean dropper, place a drop of agitated oil on the hot plate.

The diagnostic or maintenance engineer should look for the following:

1. If no crackling or vapour bubbles are produced after a few seconds, no free or emulsified water is present.
2. If very small bubbles (0.5 mm diameter) are produced but disappear quickly, approximately 0.05 to 0.10 percent water is present.
3. If bubbles of about approximately 2 mm diameter are produced, gather to the centre of the oil spot, enlarge to about 4 mm, then disappear, approximately 0.1 to 0.2 percent water is present.
4. For moisture levels above 0.2 percent, bubbles may start out about 2 to 3 mm then grow to 4 mm with the process repeating once or twice. For even higher moisture levels, violent bubbling and audible crackling may result.

He should be wary of the presence of dissolved gases, fuel, refrigerants and volatile solvents, which can cause false positives.

Although generally applicable, the crackle test does have some limitations.

1. The method is non-quantitative.
2. Hot plate temperatures above 320°F (160°C) induce rapid scintillation that may be undetectable.
3. The method does not measure the presence of chemically dissolved water.

The crackle test can be performed with a minimum of investment using the following equipment: -

1. A hot plate capable of achieving and maintaining 320°F (160°C) surface temperature.
2. A paint shaker (or equivalent) for oil agitation.
3. An oil dropper tube or laboratory syringe.

WARNINGS

The diagnostic or maintenance engineer should know that all oil has to be considered as hazardous and he should avoid oil contact with his skin, eyes and mouth and a sample should never be taken from an engine that is running.

He must exercise extreme caution when performing the crackle test on oils that might contain hazardous gases or low boiling point volatiles which might produce fumes and vapours that present inhalation and/or serious skin or eye injury upon contact. When evaluating these oils, the hot plate should remain under a vent hood that allows the analyst to conduct the test without coming into contact with fumes or vapours.

The analyst must wear protective eye goggles, gloves and a long sleeved overall. The test must be performed in a well ventilated area.

This article first appeared in the *Institution of Diagnostic Engineers* magazine late last year and is published here with their kind permission.



Drone Mountable Ultrasonic Thickness Gauge

Drone Probe Holder



1. Introduction

Checking for corrosion has always been necessary on all metal structures, with the marine industry being no exception. Over the years, various methods have been utilised for this purpose and technology has meant that hand held gauges are now much smaller and lighter than they used to be. Inspection times are becoming shorter because time is money. Another advancement in technology is in the drone industry, which is growing extremely fast with more and more applications being identified whereby drones can save money and operate more safely than traditional techniques. There is also an increasing number of different types of equipment

and sensors that can be mounted onto drones, and some of these can be used in the marine industry. The next logical step is to therefore combine these two technologies to produce a 'flying thickness gauge'.

It is obviously important to prevent corrosion occurring in the first place and therefore essential that good coatings are used. However, the problem then arises when there is a requirement to measure the metal thickness, or to check for corrosion, without disturbing or damaging the protective coatings.

Dorchester based, Tritex NDT are a leading manufacturer of ultrasonic thickness gauges used to measure metal thickness to determine corrosion rates over

time, without removing any coatings as long as they are solidly adhered to the metal. It doesn't matter whether the coating is paint, epoxy or bitumen, it is completely ignored. This has huge advantages over having to remove coatings, both in time and money. Thickness gauges are a useful tool in aiding surveyors to assess the condition of hulls, quickly and efficiently with minimum disruption. The metal thickness can be measured from one side only and corrosion levels checked to build up a good understanding of the overall condition of the boat. Measurements are often taken at a number of points over the hull, at set intervals, but this is dependent on the size and type of boat being surveyed.

2. Principle of Operation

Ultrasonic Thickness Gauges consist of the gauge, probe and connecting cable. The probe houses a piezo electric crystal which vibrates and produces ultrasound when an electronic pulse is applied. This ultrasonic pulse is transmitted into the material being measured and the time is recorded for the ultrasound to travel through the material and return back to the probe. The returned ultrasound is detected by the crystal which sends an electronic signal back to the gauge. The gauge then calculates the metal thickness using this information as well as the pre programmed velocity of sound of the material being measured.

It is therefore important that the gauge can be calibrated with varying velocities of sound. Just being able to set a gauge to 'mild steel' is not sufficient as there are varying grades of mild steel. All have different velocity of sound properties which vary in the region of 5890 m/s and 5960 m/s.

The basic principle of ultrasound, known as single echo, works well on steel with no coating. But if a coating is present then this has a different velocity of sound to that of the steel, generally in the region of 2000 m/s. Therefore, if a gauge is calibrated for steel, and the ultrasound also travels through the coating, it will take approximately three times longer to travel through the coating than it will an equivalent thickness of steel, resulting in a false reading.

There are two options to overcome this problem; the first is to remove the coating, but this is costly, time consuming and means that the coating has to be re-applied wherever a reading has been taken. In some cases, where there is an excess of corrosion, it is common to take more

measurements in that area. This would inevitably mean that more of the coating has to be removed to achieve accurate measurements.

A much simpler and cheaper solution is to use a gauge with multiple echo capabilities. Multiple echo gauges completely ignore coatings, as long as they are solidly adhered to the surface, and measure just the metal substrate. Coatings up to 20mm, depending on the type of coating, can be ignored. Multiple echo also works well on corroded metal.

Tritex NDT have developed a range of gauges, all utilizing the multiple echo technique, specifically for applications such as marine surveying, underwater inspection by divers and ROV's. The next natural progression is to use this expertise to develop a lightweight gauge specifically designed to be mounted onto drones.



Multigauge 6000
Drone Gauge Kit
(Gel Dispenser)

3. Mounting a Thickness Gauge onto a Drone

Multiple echo gauges are therefore ideally suited for use on a drone, to take high level inspections without the need to use rope access, scaffolding or rafting techniques. They can also be used within dockyards to inspect cranes, bridges and other difficult to reach places.

The Multigauge 6000 Drone Thickness Gauge, developed by Tritex NDT, transmits real time measurements wirelessly up to a distance of 500 metres using its integrated RF transmitter. The gauge takes approximately three measurements per second, even though coatings, which is ample time to take an accurate measurement of the structure being inspected. The readings are displayed and stored on dedicated Communicator software, within templates in a grid or string format. The software has an 'autologging' feature to ensure all measurements are captured and none are missed. Measurement data can also be transmitted using RS232, in parallel with the wireless output, so that measurements can be overlaid onto the drone's video output.

As ultrasound doesn't travel in air, it is important to use ultrasonic gel between the face of the probe and the surface being measured. Tritex NDT have addressed this problem with the dedicated Gel Dispenser. This is operated wirelessly from the ground station and dispenses just the right amount of couplant onto the face of the probe before each measurement. A lightweight probe holder, which has movement in all directions, helps align the probe with the surface being measured. It also has a compression spring fitted to absorb any unwanted



connected, resulting in a perfectly matched probe and gauge for enhanced performance. Also, the Automatic Measurement Verification System (AMVS) used with multiple echo ensures only true measurements are displayed, even on the most heavily corroded metals.

4. Conclusion

Drones have come on a long way, they are constantly evolving with better features and longer flying times, due to improved battery technology. It is not yet envisaged that they can completely replace the work of a human, but they can certainly assist making initial inspections a lot safer, quicker and more cost effective. However, it is important that the drones are flown by competent pilots and within the local laws of the country they are flown in. For example, any commercial use of drones outside, within the UK, requires pilots to have passed their PfCO course and they should have the relevant approvals from the Civil Aviation Authority.

Tritex NDT consider performance to be the most important feature of their ultrasonic thickness gauges. The gauge should give reliable, accurate measurements in the most demanding of applications. Whether it's coated, bare metal, corroded or clean, the Tritex Multigauge range has proven to be reliable, simple, accurate and robust. Tritex gives you the excellent performance that you would expect, with free annual calibration for the life of the gauge. Tritex NDT also offer a 3 year warranty on the entire product range.

Multigauge 6000 on DJI210

For further information please go to www.tritexndt.com or contact Mr Jon Sharland at the address sales@tritexndt.com

force caused by colliding the probe holder into the surface.

The gauge is designed to mount onto most drones as long as they can take the payload and have the facility to take a power supply from the drone battery. However, it seems that the vast majority of customers are using the DJI range of drones, more specifically the Matrice 100, 210 or 600. The system is extremely lightweight, with all three components weighing a total of only 525 grams. The Multigauge 6000 gauge and gel dispenser are equipped with a screw thread, similar to that of a camera tripod, to simplify mounting onto the drone using proprietary camera fixings. The probe holder can extend any distance from the drone using standard 16mm diameter carbon tubing but it is supplied with 2 x 250mm lengths in the kit.

Tritex NDT have also developed the Multigauge 6500 Drone, dedicated to carrying the Multigauge 6000 Thickness Gauge, to offer a complete package to customers not already familiar with drones. This drone is a coaxial octocopter, which offers multiple motor

redundancy and keeps airframe size to a minimum. It also has propeller guards to protect the rotors from getting damaged during flight. The drone operates using a PixHawk control system, for complete versatility, and it has an integral camera to capture visual surface conditions at the same time as taking measurements. The Multigauge 6500 drone has a small footprint, including folding propellers, for easy transportation and it has been designed for reliability.

The Multigauge 6000 Drone Thickness Gauge has Intelligent Probe Recognition (IPR), which automatically adjusts settings in the gauge when a probe is





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With nearly a decade of time at Nordhavn, Mike Telleria currently handles the electrical system design for all boats, serves as a compliance officer to ensure boats meet ABYC and other applicable standards, and oversees the production of the owner's manual and drawings provided with each boat. Mike brings a rich mixture of engineering experience and writing talent to the Nordhavn team. Before spending a number of years as an engineer on commercial ships, Mike earned a degree in Marine

Systems Engineering from the U.S. Merchant Marine Academy in Kings Point, NY, and an unlimited U.S. Coast Guard 3rd Assistant Engineer's license. He also spent more than 10 years in the world of recreational boating journalism as an editor for titles including Sea, Lakeland Boating and Go Boating.



Is Compliance Enough?



by **Mike Telleria**

"A compliant firetrap." This quote in the Los Angeles Times comes from a respected marine surveyor describing the *Conception*, the dive boat that caught fire and sank in early September 2019 off the coast of Southern California, killing 34 people, and considered the worst maritime disaster the state has seen in more than 150 years.

The implication is that even though the *Conception* was documented as being in full regulatory compliance, in reality the boat's design and construction presented an overly high risk of danger in the event of a fire. A relatively small boat at less than 100 gross tons and with fewer

than 49 berths, the *Conception* fell under the U.S. Coast Guard Small Passenger Vessel regulations, which in general require two means of escape from accommodation spaces located as far apart as reasonably possible.

What made this boat potentially so dangerous? Factors cited by investigators and surveyors include the boat's wooden furnishings and hull (wood covered with fiberglass), which provided ample fuel for a fierce fire. Additionally, the below-deck berthing area consisted of 46 bunks arranged in rows and columns that fit close enough together to be referred to as a "cattle boat"

configuration by divers familiar with the boat, creating challenges for the rapid escape of all occupants.

One of the biggest concerns cited by experts was that the forward stairs and aft hatch, which were the only ways out of the lower bunk space, both led into the same enclosed galley/mess above. If this galley area was completely engulfed in flames, as was reported, then neither escape route would have been a viable option. Also, one investigator was surprised by how small and difficult to access the escape hatch was, which required climbing up a ladder and sliding across one of the bunks.



The diving boat Conception burns off the coast of Santa Cruz island on Sept. 2, 2019. Photo released by the Santa Barbara Sheriff's Office. From Wikimedia Commons

The incident is still being investigated by the National Transportation Safety Board and others, and it could be months until final reports are available on what started the fire. The Coast Guard issued a safety bulletin to operators of passenger vessels about a week after the fire, with reminders to always educate passengers about safety protocols; to ensure that escape routes are functional, labeled, and clear; and to limit the unsupervised charging of lithium-ion batteries and extensive use of power strips and extension cords. This last recommendation has supported speculation that the *Conception* fire could likely have been caused by a series of electrical outlets in the galley/mess area with too many electronic devices plugged in for overnight charging.

As a builder of world-class expedition yachts headquartered in Southern California, we were rattled on multiple levels by this horrific loss of life at sea so close to home. Initially it was grief and compassion for the families and friends of those lost, who obviously had a passion for diving—shared by many of us and many owners of our yachts.

Then came introspection. What about our boats? Our escape routes? Our fire-prevention systems? Our educational efforts? Even though as a recreational builder we follow a different set

of boatbuilding standards than a builder for a small commercial passenger vessel like the *Conception*, surely a stringent review of our designs and procedures could only benefit our boat owners, their loved ones and passengers, and our company.

Newspaper headlines right after the incident gave us some direction: “Lack of escape routes in California boat fire becomes focus as investigation intensifies”; “California dive-boat fire highlights need for more than one exit from sleeping quarters”; and “Some *Conception* passengers said they weren’t told about emergency escape hatch.”

Clearly, escape routes were getting serious attention, and we wanted to be sure we knew the latest standards and were ready to answer any questions current or future owners might have. In ABYC H3 and ISO 9094:2017, we discovered a couple of areas that deserved immediate action. One was for a deck hatch planned for a brand-new model in production that would have to be designated as a second means of escape. The planned hatch with flush fittings would require a winch to open from the outside, so the specification was changed to a hatch that could be opened from the inside and outside without any tools. Another discovery was that some owners might put a carpet over an interior-deck escape hatch,

or a dinghy or other item over an exterior escape hatch; those areas would need to be addressed in our owner education, manuals, and escape route drawings.

Lastly, we held a training session to keep all managers, engineers, technical writers, and others up to date on escape routes, especially because our semi-custom boats can change a lot from one project to the next, often affecting escape-route planning. In this session, one question kept coming up: Is being “compliant” enough? It can be a challenging question.

Certainly we have a solid procedure to ensure compliance with ABYC, ISO, and even ABS, MCA, and other entities. But is it really enough if the boat is on fire and someone needs to get out right now? I think our answer is embedded in the mandate that concluded our training session: all should voice their concern at the highest level if they are in any way worried our efforts can be—or need to be—improved for the safety of our boat owners, even if those efforts go above and beyond what is required for compliance.

This article is republished with kind permission of Mike Telleria and first appeared in Professional Boatbuilder February/March 2020 edition.

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Seawork continues to expand and innovate



9 JUNE Southampton
TO 11 2020 United Kingdom

Seawork 2020 takes place at Southampton's Mayflower Park from 9 – 11 June and will feature a number of new initiatives including a new 15m link pavilion, housing the Innovations Showcase and Small Business Enterprise Zone sponsored by British Marine; a theatre-style presentation area; a Maritime Skills Day and a Mayflower 400 themed Cardboard Boat Regatta, a fun celebration of the 400th anniversary of the Pilgrim Fathers leaving for The New World.

This year Seawork will have a different look and feel, with clearer spans pavilions, increasing visibility and ease of movement for visitors and an increased number of island stands.

Seawork is the largest and fastest growing international commercial marine and workboat exhibition and conference held in a European working port environment. Now in its 23rd year, Seawork takes place over three days every year in the Port of Southampton UK and attracts over 7,700 high calibre commercial marine professionals from over 70 countries.

As the exhibition expands so do many of its exhibitors. One of the largest exhibitors, Damen Shipyards Group has a new CEO, Arnout Damen. He has been a member of the group's Executive Board, responsible for operations and commercial affairs for the last few years and now plans to work on a new divisional structure for the company "to further expand our leading position in the fields of quality, digitalisation and sustainability".

Worldwide organisation, Lalizas has a commercial presence in more than 129 countries which now includes the UK. Lalizas UK's new warehouse and sales office offers an extensive range of products for the leisure, military, and commercial marine markets. Charlie Mill, MD of Lalizas UK comments 'We are delighted to be moving forward with our plans to strengthen our presence in the UK marine market...'

Torqueedo recently announced a partnership with ZF Marine to drive electric mobility for sustainable waterborne passenger transport and have a new vice-president sales EMEA, Jochen Engelmann, who is responsible for expanding sales of the company's marine electromobility systems and driving growth.

ASL GRP (Air Sea Land Group) has unveiled its extensive new UK factory, five new recruits and a new maritime division. The dynamic armour company has over 30 years' experience globally across marine, land and airborne vehicles.

Seawork continues to attract new businesses to its pavilions and this year welcomes a wealth of first-time exhibitors. Amongst them are Ceredi SNC, an Italian company specialising in the production of steel, aluminium and plastic accessories including tailor-made tanks for small and large boats; Stone Marine Group, world's leaders in the design, manufacture, service and repair of propulsion equipment for commercial, naval and leisure vessels; Glamox, the leading supplier of lighting solutions to the world's marine and offshore markets and Belgium-based Pennel & Flipo which supplies ORCA® fabrics and NAUTA® accessories for professional RIBs, inflatables and a range of other uses.



Also at Seawork - Speed@Seawork

Immediately prior to the event itself, Speed@Seawork 2020 takes place on Monday 8 June. Mercator Media, the organisers of Seawork, introduced the inaugural Speed@Seawork in 2018 as the latest sector-specific feature for Seawork.

Fast vessels operating at high speed for security interventions and Search and Rescue (SAR) are a significant specialist sector of the commercial marine business. Speed@Seawork is aimed at facilitating growth and development for the design, build and operation of these specialist vessels. As operating demands increase, new solutions for propulsion, navigation, communications and care of the crew will be needed.

Speed@Seawork turns the spotlight on the sector, offering knowledge sharing, networking, exhibiting, sponsorship and demonstrating opportunities.



IIMS in conjunction with other organisations that make up the Small Craft Surveyors Forum, is once again presenting an afternoon of education and training content at Seawork. Attendance is free and will be taking place on Wednesday 10 June from 14.00 to 17.00. Watch for the programme to be announced soon and make sure to reserve your free place.

Come and meet the IIMS team on stand M5.

For more information about Seawork visit <https://www.seawork.com>.

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.

New AIS transponder from Digital yacht

Digital Yacht has launched a new Class B AIS transponder designed specifically for the growing number of boaters who use an iPad or tablet for their navigation. iAISTX provides a wireless interface for AIS and GPS data to apps for both iOS and Android such as Navionics, iSailor, iNavX and TimeZero.

The apps offer a detailed overlay of local AIS targets updated in real-time allowing users to see collision avoidance data such as closest point of approach and time to closest point of approach.

The Class B transponder will send boat position and identity data to other AIS equipped vessels.

“Demand for on-board, connect ‘n go tablet navigation is soaring with new apps and iPads tempting mariners to look at this competitive solution,” explained Nick Heyes, Digital Yacht CEO.



Lightweight sandwich panels

In the never-ending search for fuel economy and performance, reducing the weight of a boat is a key factor. One of the latest materials that is contributing to this goal is Thermhex from Sheffield-based Panel Systems.

Available as sandwich panels in a range of standard specifications they use polypropylene honeycomb to deliver weight savings of up to 85% compared with materials such as plywood and can be used structurally as well as for internal fixtures.

The material is ideal for everything from doors, cockpit bottoms, internal fittings, furniture and furniture components to sound abatement, the reinforcement of decks and decking panels as well as for structural or decorative bulkheads.

Thermhex can be used for most types of leisure boat, from small sailing cruisers to state-of-the-art superyachts, giving owners the reassurance of strength and durability in addition to significant weight savings and reduced fuel consumption.





New 530 model from Dufour

The 16.35m 530 is a merger of Dufour's Grand Large and Performance ranges and, uniquely, comes in three versions with distinctly different deck layouts.

The 'Easy' model is the most simplified version, set up for owners wanting simple cruising whilst the 'Ocean' model is specifically for owners seeking a traditional deck layout. The 'Performance' model is an

evolution of the Performance range and is aimed at owners wishing to race competitively, as well as maximise their cruising experience.

The aft transom area has been designed to include two access points to the cockpit from the bathing platform. There is easily accessible stowage for vital safety equipment and a liferaft, and the whole cockpit can be covered by a semi-permanent bimini.

Cabin layouts range between three cabins and three heads/showers up to six cabins. Up front there is a choice of a forward owner's cabin or twin double cabins and aft the cabin layouts offer one double and one twin.

New tiller handle from Mercury

Mercury Marine has launched a new tiller, compatible with Mercury four stroke outboard engines in the 40 to 115hp range. The tiller handle has side to side adjustments up to 18 degrees port and starboard from the centre. Users can also adjust the handle's vertical angle through an auto tilt lock system or down stop angle micro adjustment knob.

"Our extensive research revealed that boaters are looking for advanced features for personalising tiller control setup to meet their individual needs," said Mercury associate category manager Kevin Hockerman.

"As a result, Mercury developed a more ergonomic, comfortable, responsive and adaptive tiller to improve boating experiences. Our all new 40-115hp Tiller is much more than a comfortable handle. It is a state-of-the-art control system for the outboard engine."



NEW PRODUCTS

YANMAR launches new 6LF and 6LT series

The new 6LF and 6LT series of marine diesel engines from YANMAR Marine International are now available.

The six-model powerboat line-up extends YANMAR's portfolio of common rail marine diesel engines, which encompasses an output range of 40hp to 640hp.

Martijn Oggel, Global Sales Manager of YANMAR Marine International, says: "With the launch of our new engines, YANMAR's common rail range now reaches 640hp, representing a significant expansion of our line-up from the previous limit of 440hp. We are excited to bring the efficiency, performance and low emission benefits of the higher power 6LF and 6LT models, to boat owners and commercial operators."



YANMAR
6LF series

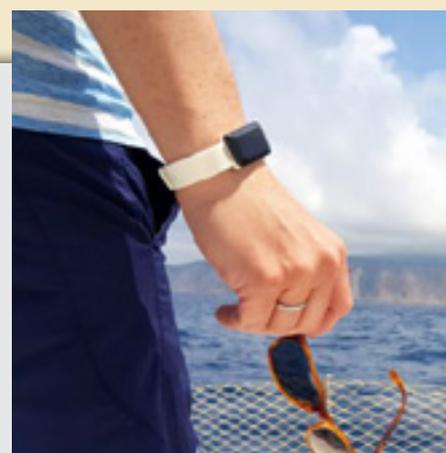
Powerclutch has new look

Spinlock's new XTR Powerclutch has been re-engineered to improve holding on the latest small diameter rope types. The clutch has new styling to complement modern yacht design and is available in a variety of colours.

"The XTX Powerclutch from Spinlock's new soft grip clutch range is packed with must-have features for high performance on the water," said James Hall sales and marketing manager for Spinlock.

"Controlled, consistent release across a full range of loads means that it is also gentle on rope covers, so increasing your ropes' life."

The clutch can be installed by one-person and has also been designed to be easy to service with removal of the jaws allowing for deck cleaning and servicing.



Start-up Crewbands ready to launch its person-over- board system

Crewbands is a system comprising a wristband and app that activates instantly with water



Wireless kill switch launched by Olas Guardian

A new wireless engine kill switch for fast boats acts as a virtual 'kill cord' that will stop a boat's engine within two seconds of any person going overboard.

For smaller workboat operators and for RIB crews the wearing of a kill cord is becoming mandatory but the standard mechanical cord type means that the driver has to be physically attached to the boat and the kill cord only operates if the driver leaves the helm. With the Olas Guardian system it means that both the driver and the crew are protected if they become separated from the boat with the boat stopping in an instant should the skipper or a crew member go overboard.

The Exposure Olas Guardian works by wirelessly logging up to 15 crew members to the engine kill switch attachment via small, wearable transmitters. If one of these wearable transmitters is submerged, or it becomes separated by distance from the helm, it instantly breaks the connection, cuts the engine and triggers an inbuilt 85 decibel alarm and, if connected, an alarm signal to a mobile phone. The system allows the engine to be restarted after a five second delay so that a rescue can be effected.

The system allows crew to move around the boat without the need to constantly remember to disconnect and reconnect a physical cord. It can be particularly suited to RIB ride and thrill ride boats with all passengers tagged.



immersion or separation from the vessel. The free app, for both iOS and Android, is also compatible with third-party fitness trackers and smartwatches.

The solar-powered wristband is equipped with a smart water sensor and shows vital information on the screens of connected phones. Once charged the device will run for two days even in complete darkness. Recharging is possible with any light source; even a lamp will suffice.

The device connects through Bluetooth 4.2 LE-smartphones and Bluetooth 5 for longer ranges. It interfaces with onboard systems of NMEA-Standard and when activated both an acoustic and optimal alarm are triggered.

New Pod launched by Seafloatech

Seafloatech has launched its latest innovation, named the Seafloatech Pod®. The system is said to have a low ecological footprint and be totally reversible.

It has previously won the 'MARIN HIGH-TECH Trophy for Innovation 2019' and 'Coup de Coeur Trophy' at the Paris Boat Show 2019. It's connected to sea, lake and riverbeds using an ecological system (anchors, screws, sealing) and consists of a mast articulated at its base, which pistons in its upper part to minimise the effects of the tide.

The Seafloatech Pod allows the construction of floating structures as collective moorings, artificial beaches, restaurants and housing.



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"We are what we repeatedly do. Excellence then, is not an act, but a habit." Aristotle

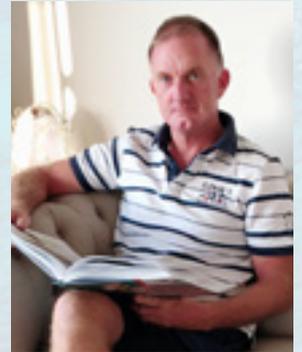
So, what is excellence? A search on the internet will bring as such, "Excellence is a talent or quality which is unusually good and so surpasses ordinary standards. It is also used as a standard of performance as measured e.g. through economic indicators."

For a marine surveyor is it the way we conduct ourselves, presentation, work ethics, undertaking the actual survey, communication with clients, or even report writing? Is it how you run your business and your profit and loss ratios, your reputation, or even your recognition in the maritime industry? How about your savvy in the court room when called upon, or your "soft, friendly" approach, or the "hard-nosed, stubborn" approach?

It could be some of the above, or disregard for the above. However, a good surveyor will always aim for excellence. You are only as good as your last survey and report. Also, the last impression you leave at the survey could be the rise or downfall of your survey company. You, as the

As James says on his website, he is a "guy that lives and breathes boats". Even his hobbies are marine related, with yachting, wind surfing and boat building featuring highly among them. Based in New Zealand, James, who holds an IIMS Diploma in Marine Surveying, became inspired over the 2019 Christmas break to write an article about excellence in marine surveying based on his own personal experiences in his relatively short career as a surveyor. It is an honest and well written article, which IIMS is keen to share with readers of The Report Magazine. This is Part I. Part II will appear in the June 2020 Report Magazine.

by JAMES NEWCOMBE AssocIIMS



surveyor, must make the decision on how you want your company to operate, be perceived, and ultimately, to succeed.

Excellence is defined in such a manner that the person, or business, are the best at what they do. They know what they are doing, they are respected for what they do, and they have great pride in their achievements. A good surveyor is the person who will be sourced for their wisdom and advice, and if, they do not have the answer, will either research for results, or direct to the appropriate experts in their field. All in a humble manner.

If a legal case is underway which maybe, as an expert witness, involving, vessel damage, valuation, wrong doing by other parties, or worst-case scenario, fatality, the surveyor will be looked upon and respected as the most qualified person attending, to give evidence

and opinion. They will be required for their excellence in their line of work.

So how as surveyors, do we achieve excellence? Is it a matter of studying and sitting an exam, or maybe just picking up a hammer and tapping boat hulls? Do we vocalize ourselves to be heard, so that everyone knows who we are, or do we keep quiet and get on with the job? Over the next few chapters I will outline some of my own experiences and attitude towards surveying. I will explain how I have refined and improved my business and lessons learnt.

Am I an "Excellent" surveyor? Maybe. Maybe not. I survey boats of all sizes every working day of the year and make a profitable living from doing so. Clients email me, or ring on the telephone, thanking for my services. Often the phrases, "excellent", "particular", "detailed", are used in referring to my services. Maybe something is working...

2. So, You Want to Survey Boats for a Living?

"The only way to do great work, is to love what you do." Steve Jobs

Surveyors usually come from a back ground of seafaring, boat

building, yachting, ship construction, mechanical engineering, or designing. The common thread with surveyors is a love or interest, of all things nautical. This may be surfing the web and looking at ships being built, or in extreme weather, building boats for fun, or weekend sailing with friends and family. It may be the cold winter nights with feet up in front of the fire, pouring over old yachting magazines, but regardless, that general interest is a common thread.

If you have a mind set of starting a marine surveying business just for the sake of making money, you will ultimately fail. The love of vessels, the interaction with clients, and vessel owners, and striving for excellence or perfection, in your surveys, are the underlying means to an end.

Myself, even as a young child, when the weather was too horrible for yachting, wandering around marinas with my parents and looking at

3. Starting your Survey Business

"I never dreamed about success. I worked for it." Estee Lauder

Money is what makes the world go around, and starting in business, the ideal situation is to have some equity behind you. You will not immediately be doing so many surveys that you are short on time. Ideally, a full-time job, which allows you to take time off to undertake the occasional survey, would be the best option. Myself, I was self employed as a boat builder and could manage time off when training was needed or the odd job came up. Even though well known in the marine industry, it still took time for the momentum to build, and to survey full time. Below are my years in business and the surveys undertaken:

Year	Amount of Surveys. Including Pre-Purchase and Pre-Insurance Inspections.		
2011	2 (Business started in December)		
2012	33	2013	51
2014	76	2015	145
2016	234	2017	281
2018	241	2019	251

The figures show reality. The business was not a true viable option for the first four years financially, and even 2015, although with 145 surveys, a good part of these were insurance surveys or minimal charged accounts if the vessel had immediate apparent faults and the survey was cancelled at the client's request.

The next step, with finance and security behind you, is to name and brand your business. This can be your name incorporated, a nautical name, or any name you so wish to choose. Remember, this is the first impression anyone will have of your business. Also keep in mind, your website and email address. Too long a name, and people will quickly tire of writing johnsmith@ionalmarinesurveysandexcellence.com.

boats, was preferable than going to the cinema and seeing the latest action flick. Instead, saving up pocket money, not only for the next sailing yacht, but starting an extensive nautical library was the goal! A "nerd"? You bet. And proud of it.

Next came school and learning wood working skills, for a future boatbuilding career, and then into a boatbuilding apprenticeship. The next 24 years were spent building traditional wooden launches, composite Maxi, Open 60, and TP52 race yachts, luxury custom pleasure launches and yachts, and self-employment in the boat repair sector. Also, a stint off shore as an owner's representative, rounded the whole experience well.

On the suggestion from a few recognized surveyors, the next step was to get the appropriate training to become a surveyor and hang out my shingle so to speak.

Hard work? Definitely. Working twelve hours a day, six to seven days per week as a boatbuilder, newly married and with a young child, and methodically studying for two to three hours each night, for eighteen months was trying, to say the least. Would this be undertaken again? At a heart-beat.

The satisfaction of studying and passing a diploma course, undertaking surveys, unpaid, with skilled surveyors, will always be appreciated. The results; a healthier life style, more family time, respect in the marine sector, a successful business, and lastly, a better income. The order written is the net result required.

However, for the aspiring surveyor, there are downfalls in the industry. Sure, there are the romantic times. Working in the sun, on a multi-million, dollar vessel, keeping nice and clean, and at the end of the day, packing up and driving home in your nice, new, work vehicle to spend some leisurely time writing a survey report for the said day of luxury.

Sorry, but in reality, not quite the

perfect picture. A typical day may be in the middle of winter, heavy rain or sleet, and high winds. The vessel may be a fifty year old fishing trawler, which the owner has no obvious pride, the decks are covered in fish entrails, and when you step into the engine room, there is more oil spread on the planking and bilges of the vessel, than is contained inside the fifty year old engine. To make matters worse, the owner is on a budget, swears constantly, berates you, hasn't showered properly since the summer of '89, and actually resents the "know it all surveyor" who is prodding through his boat. And after all that, as you come back topsides, a cold blast of wind pulls your notes from your hands never to be seen again...

To finally seal the deal, the invoice is paid six months late, if at all, as obviously you as the surveyor, has discredited the vessel to such an extent, that it can no longer be used for intended purpose...

This description may sound exaggerated, however, surveying not only comes with the good times, but also the very bad. Be prepared.

So back to becoming a surveyor. A good surveyor comes from a solid back ground in boat or ship building, boat or ship designing, time served on ships, in either handling or engineering appointments, or serving time for a marine survey company under the guidance of experienced staff. Nothing can beat hands on, long term, experience in the marine sector. A good surveyor will also undertake further formal training through a correspondence course, or school, specializing in surveying as a career. A good surveyor will undertake all of the above and if possible, will also undertake survey training under an experienced surveyor who has been in the trade for many years.

Once the surveyor has appropriate training and education, experience under a mentor, if possible, and is confident in their abilities, it is then time to start in business.

Try to keep the name manageable, memorable and professional.

This also applies to your website. Hire an expert in this field to help set up your site. You need excellence. Most clients will look at your website even if referred to you by word of mouth. Do not try to hash your own site with poor dialogue, photos and display. Your goal is for excellence. You want to be the best in your field. Unless you are a computer technical wizard, outsource this and concentrate on being an excellent surveyor.

The next step is networking. This is the most critical step. The move that will either make your business or destroy everything you have been working toward.

Networking for myself, meant travelling to every brokerage, hard stand and boat yard, insurance offices, and boatbuilding factories that I could. There I would briefly outline my business, my areas of expertise, and hand over my details all printed on a nice, precise business card. Because of the industry, most businesses will use older, established names, so this period will be difficult. But persevere, and keep showing your face. Always smile, be polite and presentable. Do not be brash, loud, and boasting of your abilities. And when you do start getting the odd survey, outline what the client can expect from you, your price, and then over deliver.

Also contact established surveyors. Most surveyors are great, reasonable people, and realize that at some stage new opposition will appear on the scene. They may even be prepared to help you. I have a fellow surveyor, who did his due diligence when starting his business, contacted myself and simply made an introduction. From that, we now talk daily, bouncing ideas off each other, updating on different clients and boats, and continuously pushing each other towards surveying excellence. Hand on heart, we both realise how much this has improved our standards and our benefit over fellow surveyors. This in turn, has resulted

into two, very successful, profitable surveying businesses.

I will quite often over quote, and still charge fairly, whilst making a tidy profit. However, if you charge the client slightly less than what you did quote, he will always remember the fact, and promote you as the surveyor to employ.

Look at what your competition provides to their clients. A lot of survey companies only send out email copies of the reports and invoices. I do both, sending by email and, sending out hard copies. And my clients have often commented on their nice, bound, copies. Ok, this is an extra cost for your business, however, this is included in the cost. Why not stand out and be known for the fine details your business provides for its clients? Remember, you are striving for excellence. Excellence takes time and effort, but the end result is well worth the effort. Printing and binding my client's surveys probably take an extra ten minutes per job. Time to let the water boil and make a coffee. As mentioned previously, what will you charge for your services? How do you find out what your competition charges? One way, be it slightly cheeky, is to cold call your opposition and ask for quotes. Why not? It has been done to myself and fellow surveyors. Or if you have good relationships with other surveyors, simply ask them. They do not want you to over charge or under cut them. A similar rate across the industry is beneficial to all.

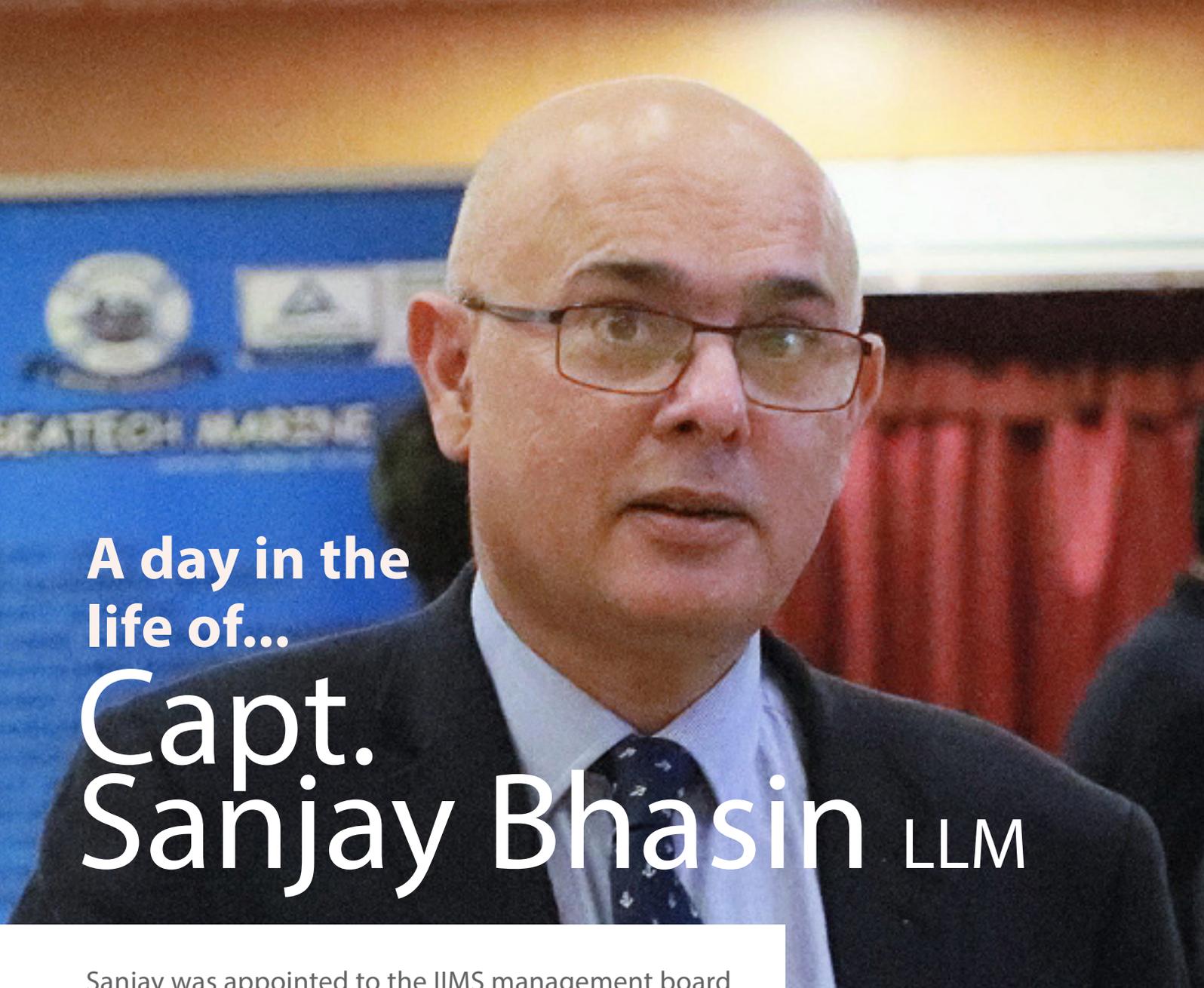
One personal mistake I made in my first few years of business was undercharging at my hourly rate. I always thought because of my lack of experience compared to the older, established surveyors, I should charge less. Big mistake. My experience was actually more in some regards. I had built modern vessels, and installed modern systems, had technical savvy, and could work harder. After two years of this, I increased my rate equal to, if not more, than other surveyors and,....absolutely no clients complained. My revenue increased by ten to twenty percent for the same amount of work.

After quoting, the client may not like what he hears. Simply move on. If they are complaining at the quoting stage, how hard will it be for them to pay your invoice?

Another added bonus of increasing your rate, is that you get rid of the dead wood. Some brokerage firms are irreputable, and will sell anything that floats. If they see a surveyor charging low rates, suddenly you will be getting a lot of work from them. They'll be your "friend" and you'll be promoted by them as the "best surveyor around". Sure, you will be inundated with work. You will have so much work that you will consider yourself as successful and an excellent surveyor in the highest regard. But beware. You will be working hard at a low rate, and unfortunately, the probability of ending up in court will also be very high. Sure, you may be a good surveyor, but, surveying such low-quality boats for these brokers, you will, one day, miss an obvious defect and become liable. I've seen this happen many times, and have been involved in court cases against other surveyors who fell into this trap. I was not worried in court. I was the expert witness telling the clergy the faults of the surveyor and their reports. Be warned. Court is not a pleasant place to be in.

The excellent surveyor will think "Quality, not quantity". Charge more, deal with high-end brokerage firms and clients, and survey quality vessels. The author now inspects more high-end quality vessels, than what he used to survey poor quality vessels.

The excellent surveyor charges a standard or above rate, performs the highest quality survey available in comparison to his contemporaries, and is recognized for such in his field. Thus, these standards attract high quality clients. They expect the best, get the best, and pay the best. Once this process begins, these clients will talk to their friends with similar wants and needs. You will survey better vessels, travel to exotic locations, and sometimes project manage the vessels you have surveyed. This all comes down to the successful surveyor providing quality.



A day in the
life of...

Capt. Sanjay Bhasin LLM

Sanjay was appointed to the IIMS management board in 2019, replacing Capt John Noble on his retirement. He is a Director of Octant Marine Ltd, a London based company, which was established in 2018 to provide marine consultancy services to P&I Clubs, H&M Insurers, Maritime Solicitors, Cargo Insurers, Ship Owners, Charterers, Cargo Owners, Terminal Operators, Port Authorities and Flag State Administrations. In this article, Sanjay chats with Mike Schwarz about his career and passion for the surveying profession.

Q1. How did you first get involved in marine surveying and what was your route into the profession?

After over 18 years at sea, having served as Master for 6 years, I decided to hang up my sea boots almost twenty years ago. It was a difficult decision. There was the thrill of commanding a ship far from the madding crowd, which I was giving up. There was the beauty of serene sunsets, visiting remote ports, meeting so many different people and a good tax-free salary. But then there were also typhoons, freak waves, pirates and sometimes the feeling that you were being placed in the arena with one or even with both hands tied behind your back.



I had always been interested in surveying and investigations. I had my fair share of misfortunes at sea and was influenced by surveyors who attended on board to assist. I started my career in marine surveying by joining the office of a large and very busy P&I correspondent. The role was very interesting, but I was not fully aware of that when I took the dip. I joined a strong team of claims and casualty managers and investigators (including lawyers) and we were supported by a large number of external surveyors. Being correspondents for all the IG Clubs, and a host of others, meant a steady stream of work. That exposed me to a variety of claims and incidents and many major casualties. With my extensive experience at sea, it was the perfect launching pad for a shore career in a field that I saw as my future. There was almost every aspect of surveying involved – investigation of groundings, allisions, collisions, cargo damages, cargo condition, personal injuries and damage to vessels to name the main ones.

Q2. Which of the many sea going skills you acquired stood you in good order to make the transformation to a marine surveyor?

It is difficult to define a single one. The responsibilities and roles were different in ascending ranks at sea. I believe that having command was essential for the work that I carry out today as I am able to analyse an incident or reaction from a Master's perspective. Sailing on general cargo vessels and bulk carriers added to my knowledge and skill of carriage of a variety of cargoes. The ISM Code assisted a lot as it required a vessel to record near-misses and investigate all incidents that occurred. My familiarity with vessel design and its capabilities, the problems faced by officers and crew and the commercial pressure exerted by all parties was very advantageous in making the transition. At sea,

you hope not to experience any incidents. I landed on the other side of the fence where there was work only if something went wrong with a vessel or a shipment. Problem solving is second nature for mariners as no assistance can be expected when you are at sea, especially of cross-ocean voyages. You are required to resolve any problem or minimise its effect yourself. That skill and experience is very handy in surveying as one is often required to suggest or find ways to mitigate the losses. It also helps in anticipating what went wrong and what could go wrong further if the situation remains unrectified.

Q3. Which aspect of marine surveying gives you the most job satisfaction and why?

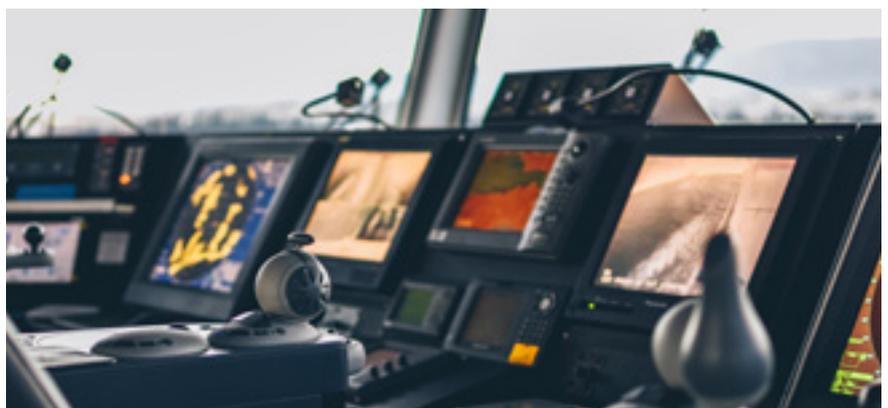
Investigation of collisions, groundings and major cargo claims are always challenging and require focus and an open mind. There could always be another way to look at causation and you cannot afford to miss out on collection of any evidence. It is very satisfying to realise that you have collected all the evidence and made all the observations that are required to establish the cause of the incident or assess the quantum of damage. It is also very satisfying if you have been able to assist the client in reducing the losses or foreseeing that something may lead to a loss in the future if not rectified/amended. I also feel very satisfied if my advice assists in increasing the safety of an operation, especially for that of the crew.

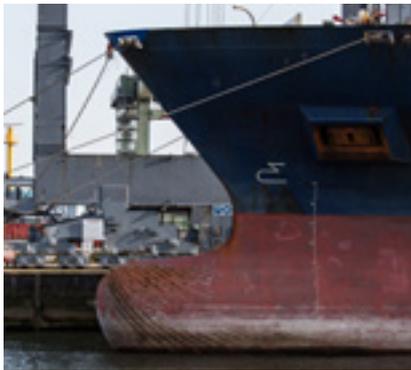
Q4. What is the most challenging and dangerous surveying job you have worked on?

Being winched down on to the main deck of a small grounded tanker with heavy winds and waves breaking over deck. The salvors did caution me that I may get washed off! Or waiting at 2 a.m. in the morning at a very secluded spot near an airport in a country recovering from a civil war, to be transported to a hotel in port. Probably the longest hour that I have ever spent, and in that duration, I was able to recall all the prayers that I had learnt since childhood. For a surveyor, the nature of the job itself may not pose any serious threat. It is the ambience in which it is carried out. That could relate to the weather conditions, motion of a vessel, safety in the docks and port or the risk of treading over the toes of powerful locals who may have a financial interest in the venture or incident.

Q5. What is the most dramatic investigation you have ever been involved with?

I was involved in a high-profile case of contraband being carried on a vessel which was detained by the Police and the entire crew was arrested. I was asked to inspect the vessel and review the navigation/routeing to establish where the contraband was taken onboard. The dossier provided to me read like the script of a Hollywood thriller. The case was widely reported in the press.





Q6. Which of the many skills a marine surveyor must possess do you believe is of prime importance?

I believe that a surveyor must carry out an objective and unbiased investigation and/or observation. That is extremely important so that a client is not misled. It is likely that the evidence/observations may not support the client's case and the surveyor must report that honestly. I think that wilful neglect or manipulation of any evidence should be avoided by a surveyor at all costs. Complacency in surveying can prove to be costly, both financially for the client and loss of reputation for the surveyor. A surveyor should treat all jobs with equal respect even if he/she has years of experience in the same field.

Q7. What encouragement would you give the next generation of marine surveyors, or those thinking about a career in this line of work?

It is a very interesting and exciting career. Marine incidents and claims are often of a high value and there are likely to be one or more competing interests. There is always something different even if the survey or incident appears to be similar. Forensic analysis of evidence provides mental stimulation and is very satisfying. The career will also give you an opportunity to specialise in certain types of claims/surveys and there are many to choose from depending on your qualifications,

experience and interests. Solving a complex case or 'whodunit' can be thrilling. Depending on the type of surveying that you choose, you are likely to get a chance to travel to many new places.

Q8. Have you a funny experience as a marine surveyor you can recall and share?

I recall interviewing a Master regarding a grounding. That was in the pre-VDR era. We were on the Bridge pouring over the Passage Plan and charts that had been used. It was difficult going as the Master was not keen on assisting and it was clear to me that his version of the event was not plausible. Sometime during that discussion, the Second Officer, who was on deck, called the Master on walkie-talkie radio, and told him in an Indian language that he had altered certain information on the chart. The Second Officer had not met me and was not aware that I was (or could be) familiar with his native language. A very embarrassed Master beat a hasty retreat. We did have a good laugh and I got what I needed to know (and suspected).

Q9. What do you say are the greatest challenges facing the surveying world in an ever-changing technological environment and how important is it for a surveyor to grasp them?

Recent years have seen a large increase in the use of electronic instruments for measurements of various parameters - for example, laser distance measurers, temperature and moisture content measurers, 360° cameras, ultrasonic testing equipment, etc. A surveyor must keep up-to-date with the new technologies and equipment that is available for use in his speciality and budget for it. Similarly, there is an increasing number of softwares available for various calculations like Optimoor, Bollard Pull Calculator etc. These are also important tools which a

client would expect a surveyor to procure and use. A word of caution about cyber threat, which is very real, even for small firms. A surveyor should seek advice and ensure that his system is adequately protected, and that the data and its confidentiality is not compromised.

Q10. Once the work is done, how do you like to relax?

If I am travelling for a survey, then I prefer to go out and enjoy the local food. Street food is my favourite but sometimes with unwelcoming consequences. If I am working in a place where it is not recommended to venture out in the evenings, I prefer to stay in the hotel and relax. If at home, well, I get the instructions on how to relax and I just follow them!

Q11. If we were to meet you in a bar, what is your favourite tipples?

A woody single malt or a glass of Merlot. I also enjoy trying the local brew when I travel to new places. As I said earlier, the career is full of challenges – at work and at play. You can always raise the bar.

Q12. Having travelled the world, which location has given you the most satisfaction, making you long to return?

It is difficult to choose as there are so many places that I would love to visit again. The attractions are different – high pressure working environment or simply laid back. Ease of working with locals or working with known people can be important for the case in hand. If I had to choose between a job in any port in India and South Africa and the rest of the world, I would accept the former. It will be good to work with some known friends and foes. Moreover, I have my roots there and I am always eager to go back. Having said that, the choice of location is not mine and I would happily accept to go to where I am required.

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