THE REPORT

The Magazine of the International Institute of Marine Surveying

MARCH 2022
ISSUE 99

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a decade of progress

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Editor's Letter

Dear Colleague

Welcome to edition 99 of the Report Magazine. Typing that sentence made me realise the next one in June will be number 100 and that is something worth commemorating; but more on that to come over the next few weeks.

As the deadline for this edition was fast approaching, sad news reached me that Jeffrey Casciani-Wood (aka Mog) had passed away peacefully following a short illness. Known to many in the marine surveying and diagnostic engineering fields, Jeffrey's passing leaves a huge hole in the IIMS family. His obituary can be found on page 40. As a tribute to Mog, I felt it appropriate to publish the last article he wrote just a couple of months ago entitled 'The Role of the Marine Surveyor' - see page 58.

This edition offers the usual eclectic mix of content covering the widest possible range of marine surveying topics. President, Geoffrey Waddington's column will baffle you and I suspect leave you scratching your head - as it did me - as he tackles the rather thorny subject of interpretation, a word that in an ideal world would probably be best removed from a surveyor's lexicon.

The article entitled 'Four inefficient shipping regulations that no one talks about' (page 79) made me stop and think. It led me to wonder why we continue with things when they have clearly become obsolete. Is it due to a sense of nostalgia perhaps? You decide.

The short article about the superyacht construction boom by Robert Frank (page 56) is a story of our times, I rather suspect. You will read that there are over 1,000 superyachts in build and the yards are crammed full. The industry has never had it so good and has not witnessed such full order books. This is producing welcome work and wealth for many, but if I have a concern, it is that corners may be cut to get the next keel laid just as soon as.

The opinion article written by Captain Mark Bull FNI entitled, 'And the Band Played on' (page 106) is perhaps another story of our times as he looks back in the aftermath of the Wakashio incident.

Sam Fortescue's article on page 50 entitled Material Obsession is fascinating. As he says, gone are the days when becoming a boatbuilder meant a few years at technical college, or an apprenticeship with a master craftsman. Those hallowed manual skills are still required, but the cutting edge of boat design has as much to do with materials science and chemistry.

Advances in technology continue to astound many of us and the feature about the use of drones by the US Coast Guard to enable them to see underwater and inside vessels during responses to hurricanes and extreme weather events is sure to intrigue you. See page 72. And sticking with the theme of technology, electric vehicles are here to stay and their transportation by ship presents some new challenges. The article by Ansuman Ghosh on page 91 adds more context to what is going to become an ever-important topic. And finally, the merging of old and new technology is always striking. The article entitled '3D Scanning and Fusion 360 in Traditional Boat Building - Using Modern Day Technology in Traditional Craftsmanship' (page 103) takes a look at the work of Daniel Lee, a Cotswold boat builder, who seems to have perfected this art.

All in all, this feels like a well-balanced edition of the Report Magazine. I hope you will enjoy 'turning the pages'.

Survey well.

Mike Schwarz, *Chief Executive Officer*

The President's Column

Dear Colleague

2022 is well upon us now and we are still suffering from the effects of the continuing global pandemic in its ever-evolving forms. At worst we may have been naïve and at best optimistic to think that things would have improved by the end of 2020, and maybe again by the end of 2021, but perhaps we should just accept that it's here to stay. By the time this is published Omicron will no doubt be a distant memory and a new variant will probably be on the horizon! As with most of industry, our head office has been suffering with the problems of staff testing positive, or coming into contact and isolating and so on. Almost daily a ferry service is affected by staff shortages for the same reasons. How many times have you heard a telephone message saying that 'due to the effects of Covid 19 we are experiencing problems due to staff shortages and/or difficulty in dealing with your request at this time, or that your order may take longer to deliver than normal'? Perhaps this is why I am still waiting for a decision from the Office for Product Safety and Standards with regard to my questions raised about the cheap diesel heaters available for DIY fitting to vessels, which I included in my article in the January News Bulletin.

Despite all this, the rule makers have been busy and seem to have been able to continue despite Covid; and some more of the effects of Brexit are now becoming apparent. From 1st January 2022 the rules regarding the RCD which is now apparently known as the RCR (Recreational Craft Regulations, as opposed to Recreational Craft Directive) came into force in Europe. I quote the RYA: *"Both the UK and EU have confirmed that any vessel being traded second-hand between the UK and EU will be required to meet the obligations set out in either the Recreational Craft Directive (RCD) in the EU or the Recreational Craft Regulations (RCR) in the UK when placed on either market after the 1 January 2021"*. In effect this means that a second-hand vessel in the UK which is to be sold into the EU will now need to have a post constructive compliance inspection conducted on it, at considerable cost, even if it was previously CE Compliant.

The RCR for the UK has been postponed until 1st January 2023 up until which CE compliant vessels will be accepted but after which time any second-hand vessels sold in the UK will need to have a post constructive compliance inspection for RCR compliance. This may be a consequence of Britain deciding to leave the EU, but why can't the rule makers be grown up about this? When we were in the EU, we signed up to the RCD along with most of the world and the standards used were harmonised standards - ISO's (ex-British Standards) - that were recognised by everyone. Therefore, surely a vessel that was accepted as being compliant on 31st December 2021 should still be compliant on 1st January 2022 - or am I missing something? Perhaps this is a case of if you won't accept ours, we won't accept yours. It was bad enough being told you would have to pay VAT a second time because the first time VAT was paid on your boat might have been while the UK was part of the EU. But now we have left the EU, if you bring your boat back to the UK, you will have to pay the VAT again. Also if your boat is in the EU and you leave it there for too long, or try to sell it in the EU, you will also be charged VAT again.

I would point out that this is my **Interpretation** of the facts in regard to the current situation, which brings me to the next subject. The following is meant to be thought provoking rather than controversial.

Interpretation is a bit of a grey area as we all know, yet by definition it should not be so. I have recently had conversations with Fraser Noble(IIMS Certifying Authority Chairman) and Mike Schwarz (CEO) regarding Tonnage Measurements and the present MCA Commercial Code situation, in particular the re-write of Workboat Code 3. In the quoted text following, I have highlighted some issues as examples:

MCA *"Interpretation 3.5.1. Where a question of application of the Code, or an interpretation of a part of the Code arises, the owner/ managing agent of the vessel concerned should in the first instance seek clarification from the Certifying Authority. In situations where it is not possible to resolve an issue of interpretation a decision may be obtained on written application to the Vessel Standards Branch of the MCA, who may consult with others as deemed appropriate". "Small Workboat" means a small vessel in commercial use other than for sport of (or) pleasure. Including a* ***Dedicated Pilot Boat****, not being used as:*

- *A tug or salvage ship;*
- *A ship engaged in the surveying of harbours or the approaches thereto;*
- *A hopper barge or dredger.*

Application

4. (1) Subject to paragraph (2) below, these Regulations shall apply to:

(a) Small workboats which are United Kingdom ships wherever they may be;

(b) Other small workboats operating from United Kingdom ports whilst in United Kingdom waters; and

(c) ***Pilot boats, not being small workboats****, which are United Kingdom ships wherever they may be.*

(2) Regulation 5 shall not apply to:

(a) ***Dedicated pilot boats****, of whatever size; or*

(b) ***Pilot boats which are not small workboats.***

(Interpretation: The wording implies that the regulations do apply to Pilot Boats which are not workboats but do not apply to Pilot Boats which are not small workboats).

A question raised was whether a vessel carrying divers, classed as a Vessel in Commercial use for Sport or Pleasure, which was then used for commercial diving operations, eg. salvage, should be classed as a workboat. The answer apparently is that vessels carrying divers should not be classed as workboats!

(Interpretation: My interpretation on this statement is that as divers are not regarded as crew (see later interpretation of crew), they must therefore be regarded as passengers, in the same way that a camera crew or even a surveyor on a commercial vessel sea trial would be regarded as a passenger).

With regard to coding and tonnage measurement we have another example of interpretation:

MGN 644 (M)

1.3 - There are many small craft including fishing vessels designed and built with an inner shell that forms the sole plate (the board on which the crew stand within the cockpit which is laminated into the shell of the hull). It has come to the MCA's attention that it can be difficult to identify when a sole board from a moulded lining provides sufficient depth in bilges to actually become a watertight weather deck. This is important because resolving the questions on decked vessels and open boats requires the identification of what is a continuous watertight weather deck, a partial weather deck, or an open boat. This question is equally relevant to Fishing Vessels, Small Commercial Vessels and Workboats.

3. Identifying Open Vessels with a Moulded Sole – Interpretation

An internal hull moulding built to create a cockpit or cabin sole is not to be considered a watertight weather deck unless the space below the sole is permanently protected from water ingress (except for watertight hatches which are to be kept closed at sea) and provides a space to be used for either accommodation, shelter of persons, stowage, or permanent reserve buoyancy which is designed to provide the greatest practicable contribution to stability and survivability of the vessel in the flooded condition.

(Interpretation: Inner hull mouldings or tanks can also form effective double bottoms. This creates an issue regarding tonnage measurement, where a double bottom is found when measuring the depth at the midships section).

The advice given in the IIMS guide is:
"Where tanks are fitted immediately below the lower terminal point of depth, and even if the tanks are glassed in, the depth dimension should be taken as though the tanks were not in that position i.e. Dimension A in the diagram below (not included here). If the surveyor is unable to take this dimension, then an educated assessment should be made".

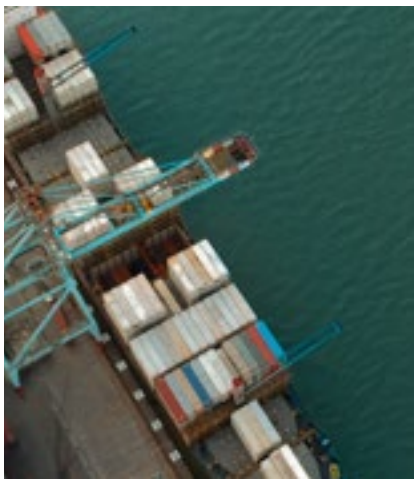
IMO
"The gross tonnage is a function of the moulded volume of all enclosed spaces of the ship. The net tonnage is produced by a formula which is a function of the moulded volume of all cargo spaces of the ship. The net tonnage shall not be taken as less than 30 per cent of the gross tonnage".

MCA
"3.4.3 Registered Depth; 3.4.3.1 Measure the depth amidships or at the deepest part of the section plus or minus 30% of the length from amidships (amidships refers to Registered Length and not Length overall) in one of the following ways:- Instructions to Surveyors – Fishing Vessels Tonnage Measurement Main Contents MSIS 27/CH 1/Annex 3/ Rev 0321/Page 14 of 28 (i) from the underside of the upper deck on the centre line to the upper side of the double bottom plating or to the top of the normal line of open floors or timbers as the case may be or, where no frames or timbers are fitted, to the inside of the hull on the centre line; (ii) for open vessels from the upper edge of the shell or the upper strake of planking or plating to the upper side of bottom frames or timbers on the centre line. Where ceiling or insulation is fitted on the tank top, its thickness up to a maximum 8 cm shall be deducted from the measurement".

(Interpretation. If there is a tank in the mid-ships section measure as close to it as you can or measure forward and aft of it and use interpolation. If there is a continuous double bottom it seems you need to either don't include it or if you do include it take a best guess at the actual depth. If you do include it and the tank top is insulated you can take up to 8cm, off the measurement to compensate for it).

The next example regards vessels in commercial use, but first we need to understand what a passenger is:
MGN 280 - *A passenger means any person carried on a ship except:*
a) A person employed or engaged in any capacity on the business of the vessel.
(Interpretation: Paid Crew)
b) A person on board the vessel either in pursuance of the obligation laid upon the master to carry shipwrecked, distressed or other persons, or by reason of any circumstance that neither the master nor the owner nor the charterer (if any) could have prevented or forestalled.
(Interpretation: a rescued casualty, or stow away)
c) A child of under one year of age.

Now we need to understand what a Crew Member is:
MGN 280 - *Crew means a person employed or engaged in any capacity on-board a vessel on the business of the vessel.*
(Interpretation: Paid Crew, i.e. someone who is paid to be on board for the purpose of operating the vessel).



As I write this my attention has been drawn to a recent decision to allow Wind Farm Service Vessels previously only allowed to carry up to 12 passengers, which from 9th February 2022 can now carry up to 60 passengers.
"To carry more workers to and from their place of work these boats must currently comply with more onerous safety requirements for passenger ships. The new rules will provide a solution to the increasing number of logistical problems in the operation and maintenance of these wind farms, which are being developed ever further from the shore".
(Interpretation: If the rules don't fit change the rules).

One requirement was that the passengers carried are required to be "Fit"
(Interpretation: Probably best not to pass comment; however the latest MCA interpretation 006 2021 entitled Light Duty Stability states that):

A Yellow Code vessel would have its stability assessed against 75kg per person whilst the Workboat Code uses 82.5kg per person).
The question is if a person's weight is an indication of their fitness.

MCA Small Commercial Vessel Code
"Bare Boat Charter" means a charter for which the charterer provides the skipper and the crew.
(Interpretation: Hire of a vessel crewed by unpaid person or persons).

MCA Inland Waters Small Passenger Boat Code
3.2.3 The Code is not intended to apply to: • Self-drive hire craft or bareboat charters (where there is no work activity being carried out by those hiring the vessel).
(Interpretation: Hire of a vessel crewed by unpaid person or persons).

British Marine Federation
Association of Inland Navigation Authorities Maritime and

Coastguard Agency Code for the Design, Construction and Operation of Hire Boats
1 'Hire boat' means a vessel not intended for the carriage of more than twelve persons, offered without a skipper or crew for the sport or pleasure of those on-board, which is not a 'pleasure vessel' as defined in the Merchant Shipping (Vessels in Commercial Use for Sport or Pleasure) Regulations 1998, SI 1998, No, 2771, and that does not proceed to sea.

The above definition is considered to include vessels with no skipper or crew provided which are:

1) – let or hired under an arrangement, whether or not on a pre-contract basis
2) – the subject of a bare boat charter arrangement
3) – the subject of any form (including timeshare) of shared use arrangement where the boat is not wholly owned by individuals and used by them, or their immediate family2 or friends
4) – used by persons who are not friends or immediate family2 of the owners. (Note that money does not have to change hands for the vessel to be considered a 'hire boat').

Excluded from this definition of 'hire boat' are boats with no skipper or crew provided which are:

1) – houseboats or other vessels that are permanently attached to their moorings;
2) – used by the friends or immediate family of the owners and where any payment is only in respect of direct operating costs during the voyage;
3) – owned by a members' club for use by its members or their immediate family where any payments made for its use are paid into club funds for the general use of the club;
4) – owned by a body corporate for the use of its employees or their friends or immediate family whether or not the user makes any separate payment for such use of the boat;
5) – in shared ownership where the boat is wholly owned by her users and used by them or their friends or immediate family.
6) – Rescue or safety craft.

Note:
The above lists are not exhaustive.

(Interpretation: A bare Boat Charter Vessel is a commercial vessel at sea but is regarded as a Hire Boat on inland waterways and therefore is not a commercial vessel).

11. 'Inland Waters'. Waters listed in MCA notice MSN 1776(M) or its amendments as falling within the categories A to D, or waters not so listed but falling within the definitions given in MSN 1776(M), or controlled waters as defined in the Water Resources Act 1991.

'Inland waters' includes any area of water not categorised as 'sea' - e.g. canals, tidal and non-tidal rivers, lakes, and some estuarial waters (an arm of sea that extends inland to meet the mouth of a river).

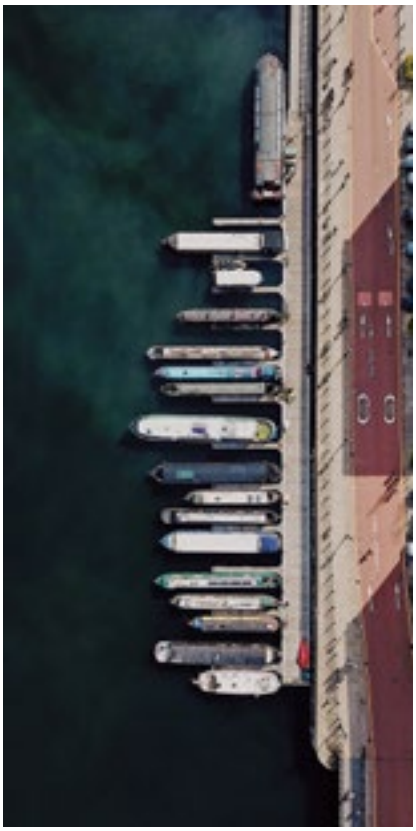
Inland waters are classified as one of four categories:

- *Category A: narrow rivers and canals where the depth of water is generally less than 1.5 metres;*
- *Category B: wider rivers and canals where the depth of water is generally 1.5 metres or more and where the significant wave height could not be expected to exceed 0.6 metres at any time;*
- *Category C: tidal rivers, estuaries and large, deep lakes and lochs where the significant wave height could not be expected to exceed 1.2 metres at any time;*
- *Category D: tidal rivers and estuaries where the significant wave height could not be expected to exceed 2 metres at any time.*

MGN 200 definition *"To Sea" means beyond Category D waters, or Category C waters if there are no category D waters. Cat D Waters: 'Sheltered waters'- significant wave height up to and including 0.5 meters. Cat C Waters: 'Inshore' significant wave height up to and including 2 meters.*

(Interpretation: Cat C Inland = in excess of Cat D Sea and Cat D Inland = the same as Cat C Sea. (If you don't go beyond Cat D waters or Cat C waters if there are no Cat D waters you are not going to sea). You may recall that this grey area was the central issue in my last column on Inland Waterways craft).

Another subject that is regularly bought up during surveys is one regarding gas installations. The question is whether a gas isolator is required adjacent to the cooker. Gas engineers have advised me in the past that an isolator adjacent to the cooker is often not required and in addition that the inclusion of a valve introduces another potential source of leaks.



Below are the extracts from ISO 10239.
Small craft — Liquefied petroleum gas (LPG) systems BS EN ISO 10239:2008
Section 6
6.6 Shut-off valves
6.6.1 Each LPG system shall be equipped with a readily accessible manually operated main shut-off valve in the high pressure side. The main shut-off valve can be the cylinder valve. The main shut-off valve may be incorporated in the regulator, as long as its action isolates the cylinder contents from the regulator input and removal of the pressure regulator from the cylinder closes the cylinder valve.
6.6.2 A dual cylinder system shall be provided with an automatic or manual change over device (selector valve), with non-return valves fitted, in addition to each cylinder shut-off valve, to prevent the escape of gas when either cylinder is disconnected.
6.6.3 A shut-off valve shall be installed in the low-pressure supply line to each appliance. The valve or its control shall be readily accessible and operable from within the vicinity of the appliance, and operable without reaching over the top of open flame appliances such as stoves. If there is only one appliance in the system and the main shut-off valve at the cylinder is readily accessible from the vicinity of the appliance, the shut-off valve on the low-pressure supply line is not required. A solenoid valve located within the cylinder locker or cylinder housing, operable from the vicinity of the appliance, is considered as meeting this requirement. Solenoid valves shall be closed in cases of lack of tension, i.e. loss of electrical actuating energy.
6.6.4 Controls of shut-off valves in the low-pressure side of the system shall be readily accessible. Unmistakable and easily recognized means of identifying the open and closed positions shall be provided.
6.6.5 For shut-off valves which are not located immediately adjacent to the appliance that they control, a means of identifying the appliance controlled shall be provided. If a valve is not visible, its location shall be clearly indicated by means of a visible and permanent label.

(Interpretation: It appears that once more the requirement for an isolator adjacent to the cooker is open to interpretation).

If there is only one appliance the valve in the gas locker may suffice providing it is readily accessible and labelled. If there is more than one appliance each one requires an isolator, which would by necessity be adjacent to the appliance itself; also, presumably if the gas locker was within the side deck or even the anchor locker of a vessel, as opposed to the cockpit, an isolator would be required as the bottle isolators would not be considered readily accessible.

A somewhat simplistic view perhaps but I hope I have given you something to think about. As in so many cases the right Interpretation either has to be based upon hard evidence and fact or you are in danger of placing yourself in the firing line when somebody disputes and questions your Interpretation.

Away from the rules and regulations, which in themselves are open to interpretation, perhaps we should analyse interpretation, which in itself is open to interpretation, if you excuse the pun!

For example: an interpretation is best described as an explanation that results from interpreting something *'the report included the surveyors interpretation of the evidence'* whereas some might say that *'An interpretation of something is an opinion about what it means'* The difference being that you can express an Opinion based upon your own personal feeling of how something appears whereas in order to give your Interpretation of something it should be based upon Facts and or Evidence.

Geoff Waddington
I.Eng; IMarEng.M.I.Mar.EST; F.I.I.M.S. (President IIMS)

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HONG KONG INVESTOR TAKES OVER BALK SHIPYARD

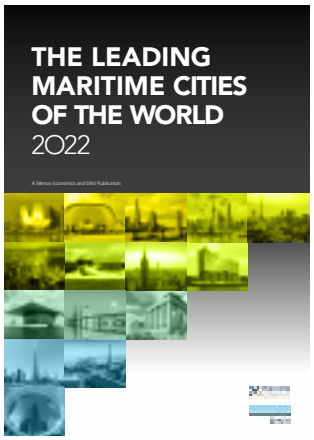
Family-owned Balk Shipyard, a Dutch shipbuilder that specialises in refits and rebuilds, has been acquired by Hong Kong-based investment company Zhongying International.

"This is game-changing not only for Balk Shipyard and our wider nautical family, but also across the superyacht industry at large," the shipbuilder said in a statement.

Balk's largest new-build to date, the 53m sailing yacht Mikhail S. Vorontsov. Image courtesy of Dykstra

Balk Shipyard, which is located within an hour of Amsterdam in the town of Elburg, has been operating for over 220 years. Notable projects include the rebuild of 27-metre explorer Sandalphon, and the company's largest new-build project to date, the 53-metre three-masted classic staysail rigged yacht Mikhail S. Vorontsov, completed in 2013.

LEADING MARITIME CITIES REPORT 2022 BY DNV AND MENON PUBLISHED



The 2022 edition of the Leading Maritime Cities (LMC) report was launched at an event hosted by the Singapore Maritime Foundation (SMF).

There have been many dramatic developments since the last edition of the LMC report was published in 2019. For one, we are still living with the pandemic. Two years of fluctuating restrictions have caused severe trade and travel upsets. Extreme weather events have made us all more acutely aware of the climate crisis, another major driver of change. Shipowners, charterers, cargo owners and lenders are gearing up for a decarbonized future, with rapid adoption of zero-carbon fuels expected over the next decade.

"Maritime cities and clusters are generating unique strategies to cope with these global transformations. They will play a leading role in the green shift, with new business models that drive the transition," says DNV Maritime CEO Knut Ørbeck-Nilssen.

The LMC report is compiled in cooperation between classification society DNV and Menon Economics. As before, it benchmarks each maritime city based on five key pillars – Shipping, Maritime Finance & Law, Maritime Technology, Ports & Logistics and Attractiveness & Competitiveness.

Singapore's strong performance across the board sees it retain its number 1 spot overall. "Singapore holds the top slot for Attractiveness & Competitiveness while also scooping the Maritime Technology title, thanks to the city-state's unrelenting focus on digital transformation. Singapore gives way to Athens and Shanghai in Shipping and Ports & Logistics respectively, and losing some ground in Maritime Finance & Law," notes Dr Shahrin Osman, Regional Head of Maritime Advisory at DNV and the report's co-author.

Two European cities feature in the top three as well. "Rotterdam's 2nd place demonstrates that it's a maritime city on the rise. Although only 10th in Shipping, the Dutch hub scores well overall and particularly in Ports & Logistics and Attractiveness & Competitiveness. London is also among the top contenders, from 5th to 3rd place overall, however it has lost out its previous top slot in Maritime Finance & Law to New York," says Dr Shahrin Osman.

About Menon Economics: *Menon Economics is an economic analysis and advisory firm, with 60 economists on master and Phd level. Menon has studied the maritime industry for 20 years and has published the biennial report The Leading Maritime Capitals of the World since 2012. For more information visit* ***www.menon.no****.*

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

FIRE AT THE FERRETTI SHIPYARD IN CATTOLICA DESTROYS SUPERYACHT

A fire broke out at the Ferretti shipyard in Cattolica, Italy. According to a local news report, the fire started around 0930 on 11 January and destroyed a 30-metre superyacht which was ready for delivery.

While it was initially suggested that the fire severely damaged two other yachts, this was dismissed by the shipyard and Ferretti released an official statement; "The fire that broke out in the early hours of the morning of Tuesday January 11, involving a boat under construction at the Cattolica shipyard, caused no injuries thanks to the immediate implementation of safety procedures, with the intervention of the shipyard's fire-fighting teams and the local fire brigade. The fire has been contained and extinguished, the site is safe. The causes of the incident are under investigation."

The shipyard is located on the coastline of Italy looking out to the Adriatic Sea, south of the beach town, Rimini and east of San Marino. The site has been in operation since 2001 and covers a total area of about 14,000 square-metres, comprising 9,000 square-metres of indoor facilities and 16 assembly stations. The Cattolica Shipyard can accommodate up to 16 20-30-metre motor yachts at a time.

Photo credit: https://www.corriereromagna.it

CARBON PREPREGS FOR SILENSEAS MAST

Composites company Hexcel has announced the successful completion of a 34m HexPly carbon fibre prepreg mast for the evaluation stage of a commercial sail power project.

The Silenseas project was started by Chantiers de l'Atlantique, Saint Nazaire, France, one of the world's largest shipyards, to validate its new concept to power the next generation of quieter and more environmentally responsible cruise ships. In combination with dual-fuel engines for ships, the composite sail plan will deliver fuel savings of up to 30%, enabling a significant step toward reducing future greenhouse gas emissions.

The HexPly M9.6 prepregs supplied to the Silenseas consortium's mast section manufacturers satisfied all project quality, mechanical, and processing performance targets delivering a scalable, cost-competitive composite solution to power cleaner, more sustainable transportation using commercial vessels.

Hexcel is a leader in prepreg solutions for large structural components, wind turbine blades in particular, and has supplied composite materials to the marine industry since the 1970s. Its products have been a key part of Silenseas rig structures since the project began and were used for the 34m high demonstrator mast recently installed on land at Chantiers de l'Atlantique's base in Saint Nazaire. The HexPly M9.6 prepregs were supplied with a range of heavyweight standard modulus carbon fibre unidirectional (UD), woven, and non-crimp fabric (NCF) reinforcements. HexPly materials used in the Silenseas project included special modifications to improve handling, lay-up speed, and consolidation.

AMSA PROVIDES FLEXIBILITY TO CONTINUE TO TEMPORARILY OPERATE WITH LIFERAFTS UNDERGOING SERVICING

Photo credit: AMSA

AMSA has amended Exemption 06 to provide the domestic commercial vessel (DCV) industry with greater flexibility to temporarily operate if a liferaft is being serviced, repaired or replaced.

Under the new arrangements:

- Vessels can continue to operate if liferaft numbers are below complement, provided there are sufficient liferafts to accommodate all on board for a voyage;
- The number of persons and liferafts must be recorded in the vessel's logbook prior to departure, and evidence that the liferaft is being serviced, repaired, or replaced must also be kept on board the vessel;
- If the liferaft is expected to be out of service for more than 14 days the vessel's safety management system needs to be updated to address these matters.

AMSA said, "You do not need to apply to AMSA to operate under these arrangements. This change will save industry time and money by no longer having to apply to AMSA for an exemption. It will also provide certainty and continuity for DCV owners and operators when a liferaft may no longer be in service."

Exemption 06 is relevant to owners of domestic commercial vessels who want flexibility as to when their vessel undergoes periodic or load line surveys, or more time to obtain a new certificate of currency for equipment, or to operate their vessel without compass adjustments that would otherwise be required.

To view the full details about the amendment, go to **https://bit.ly/3feLph4**.

SUSTAINABLE BATTERY NETWORK FOR DAMEN

A multi-purpose battery container will be used to deliver renewable power across Damen Shipyards creating a sustainable replacement for diesel generators. The Skoonbox will introduce portable renewable power to Damen's yards. Damen Shipyards Group has acquired the Skoonbox from Skoon Energy in order deliver renewable power at its own yards for applications where diesel generators or ships' engines are primarily used at present.

This 20-foot container is the first step towards Damen's sustainable battery network for mobile and temporary applications. In time, it can potentially also be deployed for customers worldwide.

"The Skoonbox, and the clean energy systems coming in its wake, are opening up tremendous opportunities for us to reduce our ecological footprint and those of our customers," said Vincent de Maat of Damen Shipyards Group.

"This is a sustainable replacement for diesel generators but it can also be used as a green form of shore power, allowing ships berthed at our repair yards to turn off their on-board engines."

EXCESSIVE RELIANCE IS PLACED ON PROCEDURES FOR ENCLOSED SPACE ENTRIES, RESEARCH SAYS

Enclosed space deaths continue to be one of the biggest occupational hazards aboard ship, says the Human Element Industry Group (HEIG), which has set up the Enclosed Space Project.

Several years ago, InterManager launched a survey on enclosed space deaths, to which 5000 seafarers responded. A number of issues were raised, in particular:

- Procedures often seem to seafarers, difficult to understand, confusing, and do not take account of the resources, equipment and time available aboard the vessel.
- Investigations of fatalities point to failures in the victims and in particular their failure to follow procedures.
- Commercial/time pressure is a significant factor and was described as 'verging on abuse'.
- Design and equipment added to the problems by creating hazards.
- Training was seen as being limited to tanker trades.

In response to these findings, eighteen months ago the Human Element Industry Group (HEIG) set up the Enclosed Space Project. The project involves the HEIG members and some 50-100 maritime sector individuals examining a number of areas with a view to influencing changes in regulations, industry practice, and training, as well as improving awareness of the problems faced by seafarers.

Image credit: University of Tasmania, Australian Maritime College

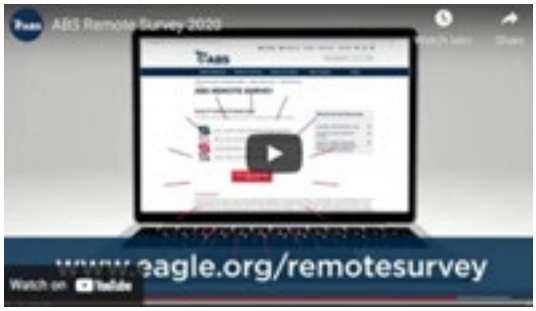
Most of the analysis is complete and it is appropriate to share some of this as HEIG moves into rolling out its action programme to deal with the problem said HEIG.

The problems identified include:

1 Excessive reliance is placed on procedures for managing enclosed space entries.
2 Enclosed space procedures are complex, labour and time intensive, and require active management.
3 They may require specialist equipment and trained rescue teams.

Welcoming the publishing of the initial findings and thanking those organisations who share InterManager's views on this problem, Capt Kuba Szymanski, InterManager Secretary General and a member of the HEIG committee, said: "For too long we have blamed the deceased seafarer for making a mistake for which they paid the ultimate price. HEIG is delving deeper into this issue to examine the more complex reasons for fatal incidents and we welcome these initial findings."

USING REMOTE SURVEY TECHNIQUES TO AUGMENT SHIPYARD SURVEYS BEING EXAMINED



A pioneering joint development project (JDP) between ABS and Nakilat – Keppel Offshore & Marine Ltd. (N-KOM) will examine how techniques developed by ABS for its industry-leading program of remote survey of vessels in service can be applied to surveys and inspections in the shipyard.

Remote inspection technologies will be applied to six Class surveys for this trial, to test how they can then be used to verify the required survey or inspection by ABS Surveyors to optimize scheduling and minimize downtime for both the shipyard, vessels and ABS.

The JDP will examine how remote techniques can be carried out on rudder clearance inspection; stern tube weardown inspection; rudder plug opening inspection; boiler safety valve testing; fit-up inspections prior to welding and final weld visual inspection of non-critical items.

PROBLEMS VERIFYING ELECTRONIC STATUTORY AND CLASS CERTIFICATES NOTED BY GARD

Ships continue to experience instances of port state control interventions, and sometimes hefty fines, allegedly because the validity of their electronic statutory and class certificates cannot be verified during onboard inspections.

The practice of issuing signed paper certificates to document compliance with maritime rules and regulations may be nearing its end. Recognising that paper certificates are subject to loss or damage and can be impractical to send to globally-trading ships, most major flag administrations, and classification societies, now facilitate the use of electronic certificates.

Read the article in full at **https://bit.ly/3GXGRYU**.

AQUA SUPERPOWER AND TRITIUM JOIN FORCES TO CREATE ELECTRIC BOAT POWER SOLUTIONS

Marine fast-charging network operator Aqua superPower has partnered with Tritium Holdings, a developer and manufacturer of fast-charging technology for electric vehicles, to deliver the first global fast-charging network for marine vessels.

Aqua superPower says that Tritium's IP65-rated technology provides a fully sealed, safe, and reliable charge for e-boats. It adds that Tritium's RTM fast charger model offers twin CCS ports and simultaneous charging capability, enabling boat owners to spend less time charging. More frequent duty cycles made possible by the chargers make e-boat technology both more efficient and more beneficial for the environments in which it is used, says Aqua.

HAPAG-LLOYD ADOPTS HAZCHECK DETECT CARGO SCREENING TOOL FOR MISDECLARED AND UNDECLARED DANGEROUS GOODS

NCB Group, the New York based cargo inspection company and the leading provider of transportation software has announced that Hapag-Lloyd, one of the leading liner shipping companies, has signed an agreement to adopt the Hazcheck Detect cargo screening tool to detect misdeclared and undeclared dangerous goods in containerised shipments. The solution has been developed and will be delivered by NCB's software division, Exis Technologies, global leaders in IT solutions for the management of dangerous goods in sea transport.

Hazcheck Detect scans all cargo booking details for keywords and includes an industry library to enable suspicious bookings to be identified that may be misdeclared or undeclared dangerous goods (DG) and other compliance cargo. The service is interactive allowing non-compliant cargo to be detected within seconds rather than days. Last minute changes to bookings, declarations, Bills of Lading and shipping instructions can be picked up in real time. This immediate response helps to prevent such cargo from being loaded onto a ship, thereby avoiding the risk of fires at sea.

DISCOVERY SHIPYARD NAMES LIQUIDATORS

Directors of UK boatbuilder Discovery Shipyard have nominated Neil Gostelow and Stephen Absolom of Interpath Advisory as joint liquidators, according to reports. Creditors have been made aware of the step.

According to records held with Companies House, Discovery's managing director John Burnie and financial director David Winduss resigned from their roles on 6 January 2022. It is believed all other employees have been made redundant.

Werner Schaebele and his investment vehicle Binti Marine Holdings Ltd became the sole owner of Discovery Shipyard in December 2019. In January 2021, at a time when the shipyard was employing 80 staff and eight apprentices, Schaebele invested an additional £2m in the yacht building business. The funds had been raised to use on capital expenditure as well as new project development.

ROY MCFARLANE IS BRITAIN'S NEW CANAL LAUREATE 2022

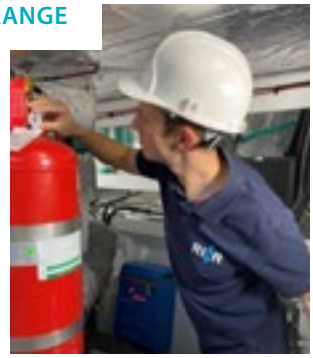
Together with the Poetry Society, the Canal & River Trust is delighted to announce the appointment of Roy McFarlane as Britain's new Canal Laureate 2022.

Poet Roy grew up in Birmingham and the Black Country, surrounded by canals. He says: "I lived, played and loved by canals and rivers and am looking forward to recapturing those stories; tales of diverse communities in urban settings who lived with canals in their backyard."

Roy began his role as Canal Laureate 2022 in December 2021, following in the wake of poets Nancy Campbell (Canal Laureate 2018-9), 2021 Forward Prize-winning Luke Kennard (2016-17) and Jo Bell (inaugural Canal Laureate, 2013-15).

During his Laureateship, Roy is interested to explore how people feel about their local canals currently, and how our national and global history can be read in the story of the canal network's development. He adds: "I'll be exploring stories of women, labour and migration in the building of these canals, and how that contributed to the Industrial Revolution with its hidden histories of colonialism and imperialism."

SUNSEEKER SET TO ADOPT MODULE F SCHEME OF CERTIFICATION ACROSS ITS RANGE



Sunseeker International is to adopt the Module F scheme of certification for its range, believed to be the first UK boatbuilder to adopt the endorsement. All of Sunseeker's models will be certified by RINA by the end of 2022.

The certification is approved under the Recreational Craft Directive (2013/53/EU) and will apply to the boatbuilder's entire range by the end of 2022.

For vessels between 12m and 24m, the certification will require two modules of assessment to be applied for. Sunseeker has appointed notified body RINA to carry out the work.

MCA RELEASES GUIDANCE ON SAFETY BULLETIN 24 – NON-SOLAS LIFEJACKET SERVICING REQUIREMENTS

The Maritime and Coastguard Agency (MCA) has published guidance on safety bulletin 24 – Non-SOLAS lifejacket servicing requirements. The MCA has published this guidance based on a recent survey of a fishing vessel which highlighted that the vessel's complement of inflatable, non-SOLAS lifejackets had not been serviced in accordance with the requirements of MGN 553: Inflatable Non-SOLAS Liferafts and Life-saving Appliances. The lifejackets had undergone servicing with a service provider that did not hold manufacturer's approval for that particular make and model.

Maritime and Coastguard Agency

All owners and operators are reminded that non-SOLAS lifesaving appliances in commercial use are to be serviced in accordance with the requirements of MGN 553 and are encouraged to check that the service stations used for servicing are approved by the manufacturer. If unsure, please contact the equipment manufacturer who will be able to suggest an approved service station.

Read more on the MCA website at **https://bit.ly/344WX4b**.

50 VESSELS JOIN THE FISHING FIRST SAFETY MANAGEMENT PROJECT

The Seafarers' Charity is pleased to report that the project to develop safety management onboard fishing vessels to the standard of the Fishing Safety Management (FSM) Code is well underway.

The new service called Fishing First Safety Management System by SafetyFolder, is being developed to improve safety in the UK fishing fleet and, at the same time, increase supply chain transparency.

50 fishing vessels have joined the project which started in the South West of England and are receiving professional support to develop their safety management practices. Auditors from the new service will be visiting the vessels and working with the owners and skippers taking part in the scheme to support them in demonstrating compliance with ILO C 188 Work In Fishing Convention by meeting the requirements of the Fishing Safety Management Code (MGN 596F).

The project has 50 vessels taking part which have been selected from a range of different vessel types and sizes. They are spread across locations in the South West of England including South Devon, Cornwall & North Devon. The map and table below provide more detail about the location and range of vessels taking part in the project.

INITIATIVE TO BOOST VESSEL TRAFFIC ON THE RIVER GREAT OUSE

A civil engineering firm has completed a project to attract more vessels onto one of the Great British waterways.

Works to create a landing stage on the River Great Ouse in Bedford have been undertaken to encourage more boats to make the journey to the head of the navigation. The project, contracted by Bedford & Milton Keynes Waterway Trust, saw the civil engineering firm Land & Water use its specialist plant to create a sheet piled landing stage at Kempston Mill on the River Great Ouse.

"We are delighted to be working alongside the Bedford & Milton Keynes Waterway Trust in supporting their mission to promote the creation of a waterway park that connects the Grand Union Canal at Milton Keynes to the River Great Ouse in Bedford," said Andy McBride, contracts manager at Land & Water.

OVER 5,000 LOST ROYAL NAVY VESSELS CAN NOW BE SEARCHED ON DATABASE

The British Royal Navy has been around since the 16th century and over that time has lost its fair share of warships to accidents and enemy fire, in fact over 5,000. Working with the Maritime Archaeology Sea Trust, it has compiled a full list of the thousands of vessels it has lost over the centuries and has released the searchable database to the public for use in further research.

The new Royal Navy Loss List covers about 5,100 warships and fleet auxiliaries lost in Britain's naval service since 1512. It is limited to the Royal Navy's own vessels - not Royal Air Force, Army, Coastguard and merchant vessels which may have had Royal Navy crewmembers. It excludes ships captured by the enemy, lost in the service of other navies or converted to merchant vessels after their naval service.

Created by the Trust in 2011, the list was originally intended to help legal and conservation experts protect Royal Navy wrecks around the globe. Its authors gradually realized that it would be of great interest to the general public and to other historians, and they have now made it accessible to all.

The database is searchable by a ship's name, class, and tonnage. More specific queries - like vessels lost in French waters over the past 500 years (760) or the number of ships lost on D-Day (416) - are also possible.

The database draws on official records, reference works, memoirs and eyewitness accounts. Archaeological reports and diver accounts were used to verify information on the survival of vessel remains.

The Loss List may be visited and searched at **https://bit.ly/3foiYxC**.

HMS VICTORY RECEIVES £35M RENOVATION FUNDING

A £35m conservation project to renovate Vice-Admiral Lord Nelson's flagship HMS Victory has been announced, on the 100th anniversary of the warship being brought into dry dock.

The ship was brought into dry dock 2 at Portsmouth Historic Dockyard on January 12, 1922. It has remained there since, and has become a beloved tourist attraction.

HMS Victory before the recent removal of her masts

Best known for her role in the Battle of Trafalgar, the Victory currently has a dual role as the Flagship of the First Sea Lord and as a living museum to the Georgian Navy.

The world's oldest commissioned warship, Victory has been undergoing a 20-year conservation scheme, including recently having its mast removed.

The new £35m project will see rotting planks removed from the hull and replaced with oak, while the vessel will be fully re-rigged. Repairs will also be done to the ship's structural framework. The work is expected to take 10-15 years.

CLIPPER UNVEILS NEW 2022 ARCTIC CIRCLE EXPEDITION AND BIG-BOAT RACING

Clipper Ventures will be offering expedition sailing to Greenland from summer 2022 as it unveils its new subsidiary, SKIRR Adventures. The company has also relaunched its racing programme with big-boat racing including the new Knox-Johnston Cup and an experiential sailing calendar as it relaunches its Clipper Events business.

Set to offer expedition voyages to some of the planet's most powerful and remote locations – by sea and land – SKIRR Adventures has been set up to 'meet the growing demand for adventure and unique experiences following long periods of lockdown'.

SKIRR's debut Arctic voyage, a 4,802 nautical mile High Latitude Expedition split into five legs, will set off from Gosport, UK, on 1 July 2022 bound for Iceland and Greenland via Scotland and the Faroe Islands.

DONATIONS TO THE RNLI SURGED IN 2021

The UK's lifeboat charity RNLI says it recorded a "huge level of support" in 2021, with donations surging after the charity saw an influx of criticism by right-wing commentators, including Nigel Farage, for its work rescuing asylum seekers in the English Channel.

While official figures are not yet available, the RNLI – which is made up of a network of the UK's volunteer lifeboats – recently indicated to the Guardian it could potentially be on course for "the highest annual fundraising total in its near 200-year history", and noted that much of its newfound support came from a rise in online donations.

Photo credit: RNLI/Neil Williams

Photo credit: Tidal Transit

HYDROGEN ENGINE RETROFIT PAYOFF

One offshore wind crew transfer operator has benefitted from reduced fuel usage and emissions with catalytic hydrogen technology. Tidal Transit's offshore wind energy crew transfer vessel Kitty Petra was fitted with the Ecomotus EcoPro catalytic hydrogen system in 2020 and Leo Hambro, commercial director, believes that the reductions in vessel fuel consumption and CO2 and NOx emissions have been tangible.

"We are very excited to have another 'industry first' on the road to decarbonising the marine industry. Ecomotus's intelligent system has shown that it reduces fuel usage and resultant CO2 emissions by 20% while also slicing 67% of our NOx emissions. It is phenomenal and I only wish we had invented it!" he said.

Ecomotus is a UK research and development company and its EcoPro system is designed to inject pure hydrogen into the vessel's engines through the air filter, thereby ensuring a 100% fuel burn in the combustion chamber and a quicker combustion cycle.

THE CANAL & RIVER TRUST HAS BEGUN A TRIAL OF HYDROTREATED VEGETABLE OIL (HVO) FUEL IN ITS WORKBOATS

Photo courtesy Canal & River Trust

The fuel is being seen as a greener alternative for boats and boating businesses with the Trust pointing out the adoption of fuels such as hydrotreated vegetable oil (HVO) will reduce carbon emissions from the boat engines while not requiring changes in either engines or supply infrastructure.

"On the waterways, we hope that HVO will provide a 'quick win,' a more sustainable, cost-friendly swap that will enable boaters and boating businesses to easily reduce their emissions," said Matthew Symonds, Trust national boating manager. "The trial of the fuel in our workboat fleet will provide valuable information on practicalities and performance."

If the trial is successful, there will be a gradual rollout across the whole Trust fleet from April 2022, to coincide with the withdrawal of commercial red diesel. HVO is made from waste oils from animal fats and vegetable oil. It has lower nitrogen oxide outputs than fossil fuel diesel and can reduce particulate emissions by nearly 90%. The fuel is stable when stored for up to ten years, is free-flowing down to at least -25°C and does not attract water. It also mixes with other diesel fuels.

It follows on from a trial instigated by the Inland Waterway Association's Sustainable Boating Group using HVO and involving a cross-section of the existing inland waterways fleet using the fuel for propulsion, domestic use and heating.

NEW GUIDANCE PUBLISHED TO HELP REDUCE PILOT TRANSFER FATALITIES

The International Chamber of Shipping (ICS) along with the International Maritime Pilots' Association (IMPA) published the guide "Shipping Industry Guidance on Pilot Transfer Arrangements", updating maritime pilot transfer safety procedures amid industry concerns about poorly rigged ladders causing severe injuries or fatalities.

Seafarers should always check the condition of the ladder before it is rigged and ensure it is secured to the ship. While this is done, seafarers should always take care of their own safety, wearing all appropriate PPE. If seafarers are uncertain about any of the requirements, they should always ask their supervising officer for advice.

IMO Resolution A.1045(27) regarding 'Pilot Transfer Arrangements' makes provisions for a 'trapdoor arrangement' in combination ladders.

The resolution states the minimum size of the opening (750mm by 750mm) and that it should open upwards and be secured flat on the platform or against the rails. The pilot ladder should extend above the platform to the handrail and remain aligned against the ship's side.

Shipping companies should ensure that:
- All ladders are SOLAS compliant;
- The inspection regime and records are adequate and maintained;
- Replacement ladders are quickly and readily available onboard; and
- Seafarers involved receive the necessary training and have a full understanding of the requirements.

The Master and officers should:
- Closely supervise the rigging of pilot ladders;
- Closely observe the boarding and disembarkation of pilots from ladders, ensuring that SOLAS requirements are met;
- Maintain a lee until the pilot vessel is well clear.

Download the guidance document at **https://bit.ly/3KIC8Cu**.

UK INLAND WATERWAYS POPULARITY SURGES ACCORDING TO THE ANNUAL LOCKAGE REPORT

The Canal & River Trust says that waterways activity in 2021 surged in popularity post lockdown. The Annual Lockage Report for 2021 shows that as Covid-19 restrictions lifted in the spring, most places recorded counts that were close to pre-pandemic levels and a boom in lock use.

"The last two years have been like no other, with the lifting of pandemic restrictions resulting in increases in lock use that are unprecedented in the 21 years of preparing this report," said Adam Comerford, national hydrology manager at the Canal & River Trust.

The Annual Lockage Report, now in its 21st year, shows how many times locks were used across the charity's 2,000 miles of waterways compared to the previous year. Estimated total lockage across all the Trust's locks was up from 2.65 million in 2020 to 3.70 million in 2021. This is slightly below the 2019 total, before the pandemic affected boating, when there were an estimated 3.96 million total lockages.

In the peak summer months lockage was higher in 2021 than prior to the pandemic reflecting the surge in popularity once restrictions were lifted.

Hillmorton Locks 2&3 on the Oxford Canal saw 8,147 lockages, an increase of 37% remained the busiest locks on the English and Welsh canal system.

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

IMCA FINALISES "GUIDELINES FOR WALK TO WORK (W2W) OPERATIONS"

The International Marine Contractors Association (IMCA) has expanded its 'Guidelines for Walk to Work (W2W) Operations' (IMCA M254). Originally published in October 2020, the guidelines were produced to help standardise the way in which vessels give personnel safe access to offshore structures, both in the wind and oil & gas industries.

Vessel owners, wind farm operators and motion compensated gangway manufacturers worked alongside an offshore energy industry focused steering group consisting of representatives from leading manufacturers of motion compensated gangway systems to develop the guidelines.

The document was originally published containing just two of six planned appendices while the industry steering group concentrated on developing the remaining appendices over an additional 12 months, representing an excellent example of industry collaboration.

Captain Andy Goldsmith, Technical Adviser – Marine

The guidelines now include nine sections covering walk to work motion compensated gangway operations for the offshore energy industry. The document advises on choosing the appropriate vessel and gangway as well as operational planning which includes gangway maintenance and ensuring the competence of key personnel. The six appendices cover emergency protocols, a framework for hazard identification, training and experience requirements, a safety report template, an induction curriculum, and guidelines covering workability analysis.

Captain Andy Goldsmith, Technical Adviser – Marine at IMCA commented:

"The IMCA guidelines, covering W2W operations, have been extremely well received by industry during the past twelve months. The finalising of the appendices provides additional information, direct from the manufacturers of motion compensated gangways, to further improve operational efficiency and safety standards for the offshore energy sector."

REPORT bites

East by West Ferries has officially launched Ika Rere, the Southern Hemisphere's first fully electric, zero-emission passenger ferry.

Pascoe International has announced the sale of the world's first 100% electric superyacht limousine tender. The tender is now under construction and will be delivered in 2023.

North-East England-based company ATLAS Decommissioning has secured the giant Inchgreen Dry Dock in Scottland and plans to make it an export hub for the responsible decommissioning of global shipping fleets.

The award-winning Gold Coast City Marina & Shipyard has introduced sustainable shipyard initiatives after partnering with the Centre for a Waste Free World at the Queensland University of Technology.

The RNLI and Coastguard launched an unusual rescue near Dartmouth, UK, after six people were seen in the water trying to save a stranded dolphin.

Family-owned Balk Shipyard, a Dutch boatbuilder that specialises in yacht refits and rebuilds, has been acquired by Hong Kong-based investment company Zhongying International.

Los Angeles and Shanghai have announced a partnership of cities, ports, shipping companies and a network of cargo owners to create a first-of-its-kind green shipping corridor on one of the world's busiest container shipping routes.

ABS has further developed its approach to ageing offshore assets with publication of the Guide for Life Extension of Floating Production Installations.

Maritime classification society Lloyd's Register (LR) has launched an Artificial Intelligence (AI) Register, a standardised digital register of LR certified AI providers and solutions.

A family dog has been rescued from rising tides, after a four-day search involving coastguards, firefighters, the police and a flying sausage attached to a drone.

Leading luxury yachting company Ocean Independence is now offering clients the option of payment with cryptocurrencies.

Safety Briefings

FUEL OIL TANK VENT PIPES SHOULD BE INSPECTED REGULARLY

A bulk cargo vessel experienced a serious problem when some of the clay cargo entered fuel oil tanks through holes in the fuel oil tank vent pipes located in the cargo holds. The problem was first noticed by the engineers when the fuel oil filters became heavily clogged with what appeared to be cargo. After the engineers shifted to a different fuel oil tank, the problem stopped. After offloading the clay and cleaning the cargo holds, the vent pipes were closely inspected in each cargo hold.

Several fuel oil vent pipes were found to have been holed by severe corrosion while others were so severely corroded and at risk of failure. The holes were found in locations that were not easily accessible. Analysis of fuel oil in the bunker tanks confirmed contamination from the cargo.

The discovery of contaminated fuel and the holes in the fuel oil vent pipes necessitated an unscheduled repair period. The contaminated fuel had to be disposed of properly. The contaminated fuel oil tanks had to be cleaned and made safe for hot work. The corroded vent pipes had to be replaced. The vessel was out of service for over 2 weeks.

While it may have been unlikely that this particular fuel contamination could have damaged machinery, rapid clogging of the filters could have unexpectedly shut down one or more engines. Had the cargo been soluble in fuel oil and of a highly abrasive nature, the fuel oil purifier and associated filters may not have been able to prevent the abrasive cargo from reaching and damaging the engines.

Lessons learned

- Fuel oil tank vent pipes should be inspected regularly and thoroughly to ensure that: the fuel is not contaminated by cargo; cargo is not contaminated by the fuel or fuel vapors; and fuel vapors do not enter spaces not designed for fuel vapors.
- Particular attention should be paid to fuel oil tank vent pipes that are: vulnerable to damage during cargo operations; or partially hidden or less visible, especially if corrosive or abrasive cargos are to be loaded or have been carried.
- A corroded fuel oil tank vent pipe in one cargo hold should immediately raise concerns about similar vent pipe problems in other cargo holds.

Image credit: The American Club

FREQUENT FAILURES OF THERMAL OIL CIRCULATION PUMP LED TO FIRE SAYS REPORT

The Bahamas Maritime Authority has published its report on the ro-ro passenger ferry Pride of Hull, which suffered a fire on 20 October 2020, in the Humber Estuary, UK.

At 20:35 the vessel's fire detection system alarm sounded, with the bridge's fire panel indicating a fire on Deck 1, zone 4: Oil treatment pumps. The AB sent to check the fire panel then relayed this to the engine control room as a fire detected in the "fuel treatment room". The EOOW went directly to the fuel treatment room to identify the cause of the alarm. 21 seconds later, the fire detection system started to identify further alarms in multiple locations in the engine rooms.

Alerted, the chief engineer left the engine control room and opened the watertight door to the aft engine room which was filling with thick black smoke; at approximately the same time, the vessel's Hi-Fog fire suppression system activated at the thermal oil circulation pumps. The engineer's call was activated, the bridge was informed and a "Code Bravo" (restricted incident) was announced on the public address system to direct crew to muster for firefighting and control.

At 20:47 the first firefighting team entered the aft engine room on breathing apparatus (BA) with two objectives: identify the source of the smoke and restore electrical power. Visibility was severely limited and no fire could be seen, the team proceeded with restoring power. In parallel, further teams were shutting down ventilation, isolating electrics and checking for hot spots.

Post-fire scene examination identified that thermal oil circulation pump #1 was the seat of the fire.

Probable cause
Examination of the thermal oil circulation pump identified that progressive bearing failures caused extreme frictional heating, generating temperatures in the order of 1,200°C, far in excess of the auto-ignition temperature of the thermal oil used in the system.

Furthermore, assessment of the fire suppression system identified that the system's effectiveness was compromised by pump output when multiple zones were activated and its dependence on a domestic fresh water pump to maintain supply for longer than two minutes.

Download the report at **https://bit.ly/3fya1Sc**.

THE IMPORTANCE OF VERIFYING WIRE ROPE TERMINATIONS

Wire rope and its associated cable assemblies are an essential part of the marine industry in a variety of load-handling applications. In many instances, maintenance and replacement of these cables involves multiple layers of fabrication and service providers who rely on quality management processes to ensure the correct product is supplied to the end-user.

On January 4, 2021, a Fast Rescue Craft (FRC), while being manually winched to its stowed position onboard a floating offshore installation in the Gulf of Mexico, fell approximately 135 feet into the water when its wire rope end termination failed. Luckily, the crew of the FRC had exited the craft just moments before the incident. The subject wire rope in the casualty had failed within one month of its installation.

As a result of the casualty, the Coast Guard initiated an investigation into the causal factors that contributed to the cause of the incident. While the incident is still open for investigation, the Coast Guard's Office of Investigations and Analysis has issued two Safety Alerts related to the case (Safety Alert 04-21 and Safety Alert 08-21).

REPORT bites

2021 was a year of dramatic progress and growth for LNG (Liquefied Natural Gas) as a marine fuel and its pathway to decarbonisation.

Brand Marine Consultants GmbH reports that technical operations to remove the wreck of the grounded bulker Wakashio, along with all associated debris, concluded 16 January 2022.

Spanish ferry operator Baleària has embarked on a project to build the first electric passenger and cargo ferry that will be pollution free during port stays and approaches and incorporate green hydrogen on an experimental basis.

A project to expand parts of the Suez Canal is expected to be completed after two years of work in July 2023. The announcement of the accelerated plans comes in the wake of Ever Given container incident.

The zero-emission, fully electric Yara Birkeland is preparing to carry its first fertiliser cargo on the Herøya-Brevik route in early 2022.

Maersk Supply Service and Ørsted plan to launch the world's first full-scale offshore charging station for vessels, at an offshore wind farm, in the third quarter of 2022.

Sea Machines Robotics has announced that it has completed the world's first 1,000-plus-nautical-mile autonomous and remotely commanded journey of a commercial vessel at sea. The autonomous tug Nellie Bly completed its journey in just 129 operational hours over 13 days.

Finnish technology group Wärtsilä has revealed plans to commercially launch its Two-Stroke Future Fuels Conversion platform during the first quarter of 2022.

The 99-year-old passenger ferry Baragoola, formerly operated by the Port Jackson and Manly Steamship Company and laid up since 2003, sank at its moorings at Sydney's Lower North Shore on January 1.

Peel Ports has signed an international sediment management pledge to more effectively manage the disposal of sediments as part of the necessary dredging of its ports and harbours.

Safety Briefings

CARRIAGE OF RICE: AN OVERVIEW FOR THE MARITIME SECTOR

The carriage of bagged rice cargo is a potentially hazardous undertaking, with claims potentially running to millions of dollars when problems arise, says the Britannia P&I Club. The major issue with cargoes of bagged rice is the formation of mould or caking which can often be attributed to condensation due to inadequate ventilation, water ingress, moisture migration and improper dunnaging.

Cargo holds should be properly cleaned and prepared, ideally to grain standards. The accepted definition of 'grain clean' is provided by the National Cargo Bureau in the United States which states that:

Compartments are to be completely clean, dry, odour-free and gas-free. All loose scale is to be removed. In general, the holds should be clean, dry and free of residues from previous cargo and with no rust scale. In practice, for bagged rice cargoes, the holds should be dunnaged and the rice packed in polypropylene bags which together should provide protection from any limited dirt present in the holds.

Loading

Ship staff should monitor the temperature of the cargo throughout the loading process. The average temperature of the cargo is important for assessing when to ventilate during the voyage. Ship staff should also monitor the cargo being loaded for signs of damage, mould, insects, wetness or staining etc. Any cargo or bags not in sound condition should be rejected. A Letter of Protest should be issued and ship staff should always take photographs and preserve all relevant evidence to help defend any potential claims.

The crew should closely monitor weather conditions and close the holds promptly if rain or poor weather is expected. They should not rely on shippers, agents or surveyors to make such assessments. Rain wetting of part loaded holds is particularly problematic, as the water drips between the bag layers and affects an unknown quantity of bags.

Read the full article at **https://bit.ly/3fsOY3D**.

FIRE ON A MOTOR CRUISER EXPOSES POSSIBLE SHORTCOMINGS IN IRISH PLEASURE CRAFT LEGISLATION

An investigation by the Marine Casualty Investigation Board (MCIB) into a fire onboard a motor cruiser on the River Shannon in Ireland has exposed possible shortcomings in Irish legislation governing the safety of pleasure craft.

On 6 September 2020, four people set out in X4, a Linssen Grand Sturdy 35.0 motor cruiser rented from boat hire service, Carrickcraft. After around 45 minutes a fire broke out in the engine compartment. The passengers, who had been given training in emergency responses, donned lifejackets and telephoned the Carrickcraft base, from which an emergency crew was immediately dispatched. Gardaí and the fire brigade were also alerted, while a passing vessel was able to take the crew on board.No one was hurt in the incident which caused the motor cruiser to sink in around eight metres of water.

The MCIB report found that the seat of the fire was in the engine compartment but the vessel was so badly damaged the exact cause of the fire was impossible to determine and will never be known.

As charter vessels operating on the inland waterways network are not manned by a commercial skipper and crew, they are considered recreational craft and are subject to the requirements of the Code of Practice (CoP) for the Safe Operation of Recreational Craft, rather than the arguably more comprehensive Merchant Shipping Act 1992.

"The CoP does not provide for the mandatory fitting of fire detection systems on recreational craft and hence there was no fire detection system fitted to the Carrickcraft vessel X4," said the report.

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

THE ADVICE IS KEEP BATTERIES OF ANY KIND AWAY FROM METAL OBJECTS

During a routine inspection on a vessel in cold lay-up, the lifejackets stored underneath a sitting bench in the wheelhouse were found burned and melted. No one was harmed in the incident.

Burned lifejackets

The lamp used in the lifejackets

A Lithium battery (3.6v) had exploded in one of the self-igniting lights. As the bench was in a properly closed position, without any gaps, the fire could not spread due to a lack of oxygen. Therefore the fire was not detected and did not activate a fire alarm, as the smoke was contained inside the storage compartment. Investigation showed that the battery of the "Lalizas 71209" life jacket light had expired five months earlier.

A possible cause could be that this battery was exposed to moisture before the lay-up period and water ingress affected the battery content after the lifejacket was put back in storage.

Lessons learned:

- Store such equipment in a secure, dry and cool place away from flammable materials;
- Keep batteries of any kind away from metal objects to avoid short circuit between the terminals;
- Lithium batteries in your workplace:
- Assess where Lithium batteries are present and check, if possible, the condition of the battery and cover;
- Verify the expiry date of the battery;
- Regularly inspect batteries of lifejacket lights and other devices like radios as per planned maintenance schedule;
- If batteries are expired or damaged, remove them and dispose of them properly;
- For laid-up vessels, it may be appropriate to consider whether or not to remove Lithium batteries and other hazardous materials from vessels before going onto lay-up.

REPORT bites

Britain's first electrically-operated floating swing bridge, Northwich Town Bridge, is swinging again, thanks to a £300,000 repair.

GTMaritime has released a new publication which offers a guide to the background, current state and future development of satellite connectivity and communications at sea.

Lyman-Morse shipyard is teaming up with Navier to build a new 27ft all-electric hydrofoil. Navier 27 is a foiling performance vessel capable of a range exceeding 75 nautical miles solely under electric propulsion.

The preliminary results of a new study by Global Industry Alliance for Maine Biosafety have revealed that removing slime from ships' hulls reduces greenhouse gas emissions (GHG) emissions by up to 25%.

The Seafarers Hospital Society has appointed Captain Kuba Szymanski as the new Chair of the board of the 200-year-old UK maritime charity.

The Netherlands-based sustainable shipping company EcoClipper has purchased 'De Tukker', a retrofit vessel, with an aim to establish sustainable shipping on the North Sea.

"Saturday Night Live" stars Pete Davidson and Colin Jost partneringd with a Manhattan real estate broker, Paul Italia, have been revealed as the buyers of a decommissioned Staten Island Ferry, the John F. Kennedy ferry, at auction for a reported $280,000.

According to Facts and Factors, the green hydrogen market size and share revenue are expected to grow from $755 million in 2020 to reach $1,423.2 million by 2026.

The Australian Department of Defence's Pacific Patrol Boat Systems Program Office has relocated to Cairns from Canberra so that it can better support the Pacific Maritime Security Program.

Svitzer Towage has announced what it states will be the world's first methanol fuel cell tug and conversion of its London and Medway fleet to burn carbon neutral marine biofuel.

Italian design studio Lazzarini has unveiled a 150-metre flying superyacht concept powered by helium, known as Air Yacht.

Safety Briefings

REPORT REVEALS DIESEL GENERATOR ENGINE FAILURE LED TO FIRE ONBOARD OFFSHORE SUPPLY VESSEL

The National Transportation Safety Board (NTSB) has published a Marine Accident Brief on its investigation into a diesel generator engine failure and fire onboard an offshore supply vessel near Honolulu, Hawaii, last year. The incident took place on the Ocean Intervention on December 19, 2020. No pollution or injuries to the 16 crew members were reported in connection with the mechanical failure, which resulted in a fire in the engine room. The crew isolated the fire before it could spread throughout the vessel.

While at an anchorage, the Ocean Intervention crew had been troubleshooting speed variation issues related to the number 1 and number 3 diesel generator engines, which involved replacement and calibration of several electrical components and multiple engine restarts. When later carrying the vessel's electrical load, the number 3 diesel generator suffered catastrophic mechanical failure. The NTSB said this resulted in cylinder number 1's connecting rod being ejected through the engine crankcase while running at rated speed. The ejection of the connecting rod allowed atomized oil to be released from the engine and ignite, starting a fire in the engine room. The crew's quick and effective actions to prevent the spread of the fire resulted in the fire extinguishing itself without putting crewmembers at risk.

The NTSB determined the probable cause of the diesel generator engine failure was a cylinder's connecting rod bearing adhering to the crankshaft, which led to the ejection of the connecting rod and catastrophic damage to the engine.

"Engine rooms contain multiple fuel sources as well as mechanical ventilation, making the spaces especially vulnerable to rapidly spreading fires," the report said. "The crew of the Ocean Intervention effectively contained the spread of a fire by removing fuel and oxygen sources. Vessel crews should familiarize themselves and train frequently on machinery, fuel oil, lube oil, and ventilation shutoff systems to quickly act to contain and suppress engine room fires before they can spread to other spaces and/or cause a loss of propulsion and electrical power."

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

Damaged section of the engine (left) from where the connecting rod from the no. 3 DG (right) was ejected. (Credit: Oceaneering International).

CORRECT USE OF HYDROSTATIC RELEASE UNITS SAFETY ALERT ISSUED BY AMSA

The publication by the Australian Marine Safety Authority (AMSA) of Safety Alert: 02/2021 aims to raise awareness of the correct use of hydrostatic release units, for both float-free life rafts and float-free EPIRBS.

The Hydrostatic Release Unit (HRU) is designed and approved to automatically deploy a life raft or EPIRB in the event of a vessel sinking. HRUs operate between 1.5 and 4 metres of water depth, to release the securing mechanism for the life raft or EPIRB.

AMSA inspectors often identify circumstances where HRUs are incorrectly fitted. In 2021, AMSA has issued over 100 deficiencies in relation to deficient HRU arrangements on life-rafts and float-free EPIRBs.

Life raft HRU's
The HRU that is used on life raft securing devices cuts through a cord that fastens the securing straps. The life raft container has enough inherent buoyancy to float free from its cradle and in doing so, pulls out the life raft painter to inflate the raft. The painter is attached to a weak link that is designed to break once the raft has inflated. It is important that the HRU and weak link are correctly installed. If the painter is not attached to the weak link correctly, the raft may not inflate, or may not release from the sinking vessel.

HRUs are designed to operate with specific equipment. The HRU for a life-raft must be suitable for the size of life-raft secured. Multiple life-rafts must not be secured by a single HRU unless approved by the manufacturer.

Over tensioning of the securing straps can lead to failure of the HRU to operate. Similar problems can occur when there is insufficient load on the HRU. Securing straps should be taut but not over tight. Care must be taken to ensure the securing straps on a life-raft canister will release when the HRU activates, and that the life-raft painter is attached to the HRU weak-link.

EPIRB HRU's

The HRU that is used for a float-free EPIRB operates in the same way, but usually cuts through the mechanism securing the EPIRB container. Once the container is opened, the EPIRB will float free and activate.

The HRU on a float-free EBIRB should be checked to ensure it is installed correctly. No additional lashings should be used on the EPIRB housing – this can prevent the housing cover from releasing when the HRU activates, stopping the EPIRB from floating free.

Correctly fitted HRU on a life raft

Servicing and expiry

HRUs can be serviceable or disposable.

Re-useable HRUs must be serviced annually to ensure they will work when required. The HRU must be serviced by the manufacturers authorised service agent. Disposable HRUs have a service life once installed and must be replaced once they reach their expiry date. The service life of the HRU is determined by the manufacturer. Most disposable HRUs have a service life of two years after they have been installed on the vessel. The date of installation or expiry is marked on the HRU.

Reminder

- Check that you have the right HRU for your safety equipment
- Check that hydrostatic release units are correctly installed
- Check that life-raft painters are connected to the HRU weak link
- Ensure HRUs are serviced or replaced by their due date

REPORT bites

Swedish based Saffier Yachts is expanding into a new 7000m2 site in Ijmuiden which will allow it to build 35 yachts at a time.

A UK £2m three-year project to develop wind turbine blade recycling in Britain for the first time has been given the go-ahead after winning a UK Government grant.

An Australia-based naval architect has criticised what he calls the unwillingness of government officials in Scotland to acquire modern catamaran ferries to replace the aging vessels still in use on the country's West Coast.

General Motors said it has acquired a 25-percent stake in Pure Watercraft, the Seattle-based e-propulsion outfit for approximately $150 million, a number confirmed by Pure CEO and founder Andy Rebele.

In the last 10 years, there have been 97 new container ships of between 15,000 and 19,990 TEU, and since 2018 74 ships of 20,000 TEU and above.

The US-based Maritime Partners has revealed that the M/V Hydrogen One, the world's first methanol-fuelled towboat, will join its fleet and become available for charter in 2023.

Princess Yachts is looking to expand its production capacity following an unprecedented rise in demand. The luxury boatbuilder says opportunities are being investigated to enable it to produce more vessels, employ more people and fulfil its US$1bn order book.

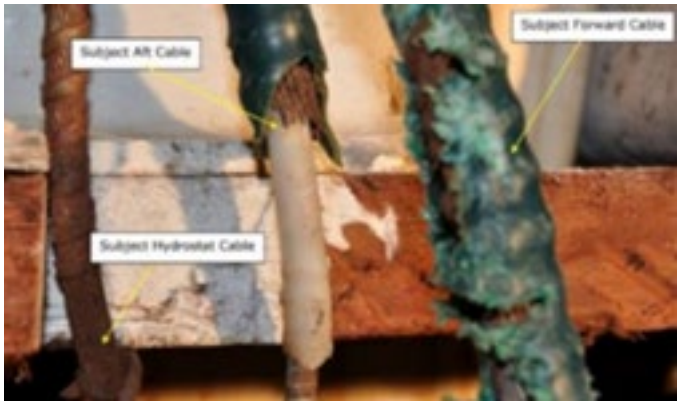
Works to redevelop areas within Pembroke Port and create the infrastructure needed to support the development of a world-class marine energy hub have started.

Shell has officially changed its name to Shell plc, after deciding to move the headquarters from the Netherlands to the UK and, as a result, remove the Royal Dutch designation from its name.

Composites company Hexcel, has announced the successful completion of a 34m HexPly carbon fibre prepreg mast for the evaluation stage of a commercial sail power project.

Safety Briefings

FATALITY ONBOARD CAUSED BY DAMAGED RELEASE CABLE



The U.S. Coast Guard has issued its report from its investigation into a fatal lifeboat accident on Shell's Auger tension leg platform in the U.S. Gulf of Mexico in 2019.

The incident took place during a routine lifeboat launch and retrieval drill on June 30, 2019. Two people inside the lifeboat were killed when it fell 80 feet, landing upside down in the water. Another person, who was exiting the lifeboat when it released, was seriously injured.

According to the report, the aft hook on the Auger platform's Lifeboat No. 6 inadvertently opened as the lifeboat was being winched into the davit following the drill. "The lifeboat, still hanging from the forward hook, swung in a pendulum motion away from the facility. A few seconds later, the forward hook separated from the lifeboat and opened, and the lifeboat fell approximately 80 feet, landing inverted in the water," investigators said in the executive summary.

"Based on the evidence collected and evaluated, it is probable that on the morning of June 30, 2019, the crew cycled (open to closed position) the hooks two times while in the water. The cable conduit, already compromised, was exposed to additional stresses, including compression and stretching. It is probable that during the second cycling event, the conduit, already weakened and damaged, separated during the closing action. As a result, when the system was reset, the locking shaft on the aft hook did not return to the fully closed position, but rather, came to rest in an "almost open" position. In this position, the hook could support the weight of the lifeboat and its occupants," the report stated.

Lessons learned

- The primary causal factor that directly contributed to the casualty was the complete separation of the aft hook control cable conduit surrounding the inner member.
- The operator and/or OEM's failed to replace the aft hook control cable after it was identified as damaged.
- Contributing factors of the incident include the lack of systems, policies or regulations in existence to ensure that control cables are properly monitored and changed out in accordance with the OEM's recommendations and/or best industry practices.
- The final report calls for instituting regular inspection and replacement schedules for lifeboat hook control cables, along with a requirement for the Coast Guard to review the entire lifeboat/release mechanism system during the design approval phase.

Download the report at **https://bit.ly/3tzpN7z**.

LACK OF RISK ASSESSMENT CONTRIBUTES TO SINKING OF FISHING VESSEL SAYS MCIB REPORT

The Marine Casualty Investigation Board of Ireland (MCIB) has published its report on the sinking of FV Aztec, which took place off Duncannon on 11 January 2021.

At approximately 10.45 hrs the FV Western Dawn hauled its net and the FV Aztec passed back the end of the net to it. It was then decided to pass fish from the FV Western Dawn's net to the "FV Aztec. The crew of the FV Western Dawn passed over the bag rope and this was hauled up on the main winch aft. The bag rope from the FV Western Dawn was heaved across to the FV Aztec using the main winch through the aft starboard towing block.

The Gilsen winch and lifting derrick are situated starboard forward. The Gilsen winch was then secured to the bag rope/lifting strop and the cod end was taken onboard, one lift at a time allowing the fish to enter the fish room via scuppers on the deck. The securing of the bag rope on the aft starboard hanging block and subsequent lifting of the cod end lift caused the vessel to list to starboard and immerse the hole on the aft starboard side of the deck.

As the fish were being taken onboard the FV Aztec the skipper noticed the water was not clearing off the aft deck in the usual manner. At the same time a crewmember noticed water flooding into the steering compartment through a hole in the deck. The crewmember attempted to stem the flow with an oilskin and alerted the skipper.

As the steering compartment flooded, the vessel lost its reserve buoyancy aft and began to settle by the stern. The crew tried to let go the net as the Skipper manoeuvred alongside the FV Western Dawn. Once alongside, with the stern going under water the skipper of the FV Aztec instructed the crew to abandon ship and to transfer across to the other vessel. At this stage the fish hold bilge alarm sounded as it began to flood through deck scuppers and the open hatch.

The crew of the FV Aztec successfully transferred to the FV Western Dawn and watched their boat sink in less than one minute. The vessel settled by the stern as the water filled into the fish hold and into the engine room through the open watertight door.

There were no risk assessments or method statements for pair trawling listed in the FV Aztec's safety statement. Effective risk assessments and procedures would have highlighted dangers associated with pair trawling.

The vessel was heavily laden at the time and dependant on the buoyancy provided by the steering compartment to maintain its longitudinal stability. Although not required, the FV Aztec had stability calculations done in 2017 for ten tonnes of fish in the hold. These stability calculations concentrated on lateral stability and did not address longitudinal aspects of stability. It was stated during recovery operations that the FV Aztec had between ten and 12 tonnes of fish onboard. Although no limits are set for vessels of this size, the loading of the vessel was a contributory factor in the sinking. This must take into account the weight of the catch onboard as well as the positioning of fish in the hold. The effect of the additional catch being taken onboard at the time of the incident will have also caused considerable settling by the stern and listing to starboard. The combination of these forces will have left the longitudinal stability of the vessel dependant on the buoyancy provided by the steering compartment.

Finally, the steering compartment of the FV Aztec had no bilge alarm fitted and no means of directly pumping out this compartment. A small drain hole allowed water to drain from the steering compartment onto the fish hold.

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

REPORT bites

The UK Royal Navy said it is testing a new crewless minehunter as part of its drive toward autonomous systems.

In pursuit of decarbonisation, Port of Blyth has made a multi-million-pound purchase to acquire its first fully electric crane from Finnish manufacturer Konecranes.

US classification society ABS will work with HHI's Korea Shipbuilding and Offshore Engineering and its autonomous navigation subsidiary, Avikus, to integrate autonomous and remote-control functions into vessels.

Verifavia Shipping has launched what it claims is "the world's first real-time Carbon Intensity Indicator (CII) Dashboard to determine the operational efficiency and CII rating of ships over 5,000GT."

The London-based Environmental Investigation Agency claims that IMO is dragging its heels over marine plastic pollution caused by vessels.

Advanced fire fighting systems and safety equipment aboard 'Yara Birkeland', the world's first fully autonomous containership, have successfully completed their first annual service.

Leading luxury yachting company Ocean Independence is now offering clients the option of payment with cryptocurrencies. The company is working with Austria-based Salamantex GmbH, who will manage the systematic processing of payments.

The Brodosplit shipyard in Split, Croatia, has reportedly signed a contract to build two large vessels that, together, are worth more than 200 million euros.

The world's first electric and self-propelled containership – Yara Birkeland – has completed its maiden voyage in the Oslo fjord, the ship's owner, Norway-based Yara International, revealed.

On the occasion of the 152nd anniversary of the opening of the Suez Canal, the canal's authority revealed over 1.4 million ships had transited the waterway since its inauguration.

The Bahamas Maritime Authority has published its report on the ro-ro passenger ferry Pride of Hull.

Safety Briefings

TWIST-LOCK FOUNDATIONS SHOULD BE INSPECTED REGULARLY

The American Club has published guidance and some lessons learned following an incident that involved corrosion of the twist-lock foundations and pad eyes.

A general cargo vessel had been modified to carry containers on the cargo hatches. Various twist-lock foundations and pad eyes had been welded to the hatch covers to secure containers. While the vessel was in port preparing to offload and load containers, the newly arrived Chief Officer noticed that many of the twist-lock foundations and pad eyes were significantly corroded. He raised his concern with the Master. They jointly inspected them and found them likely to be unsafe due to the excessive corrosion.

The Master called the vessel management company who made arrangements to offload the remaining containers, find a lay berth and make repairs. The vessel spent 2 days at the lay berth and then resumed its schedule without incident.

The incident was written up as a near miss by the Chief Officer who correctly felt that several of the fittings and pad eyes were on the verge of failing and containers could have subsequently been lost or seriously damaged.

TWO SMALL FIRES ONBOARD CAUSED BY CRANKCASE FAILURE

The Marine Safety Forum has published an alert focusing on a case where a vessel experienced crankcase failure. The vessel suffered a crankcase failure on one of their four diesel generators (DG) which resulted in two small fires and excessive damage to the pistons, con-rods, and the engine block.

Findings

After investigation, it was found that main bearing number 9 had worn out. It had been very hot at some point. When the main bearing cap was dismantled the upper bearing was located in the bearing cap, resulting in the bearing had been turning on the crankshaft. This blocked the lubrication hole on the main bearing, and as the con-rod at cylinder number 16 received its oil supply from main bearing number 9. This meant that the cylinder number 16 con-rod also lost its oil supply. This was probably the main failure from the start.

The investigation also concluded that:
- The DG had recently undergone a major overhaul.
- The maintenance of the DG was in order as per the manufacturer's instructions.
- The running hours were well below the manufacturer's guidance.

Lessons learned
- The vessel had in place "plexi-glass" surrounding the DG's this resulted in less secondary damage than normally results in these types of failures.
- The Chief Engineer's Standing Orders stated that no prolonged work scopes would be carried out alongside a running DG (where possible).
- The Emergency Response Plan was effectively implemented by the well-trained and drilled crew.

THE AMERICAN CLUB
100 YEARS OF SERVICE 1917 2017

UNFAMILIARITY WITH FIRE EXTINGUISHER EQUIPMENT LET FIRE SPREAD TO THE BILGES

The American Club has published some lessons learned from an incident where a general cargo vessel's generator experienced a catastrophic failure while underway resulting in a fire that spread immediately to the bilges under the generator.

After notifying the bridge and the Chief Engineer, the senior engineer expected to see the junior engineer already using the foam extinguisher. When he didn't, he ran from the control room to the semi-portable foam extinguisher and found the junior engineer struggling to determine how to activate it. He was trying the turn the lever on the top of the extinguisher but had not pulled out the safety pin.

The several-minute delay in using the fire extinguisher allowed the fire to spread and smoke was quickly filling the engine room. The smoke forced both engineers to evacuate. The bridge sounded the general alarm and the entire crew responded. When the engineers were accounted for, the engine room was isolated and the fixed CO2 system was triggered to put out the fire.

Probable cause
During the investigation that followed, the junior engineer admitted he was not familiar with how to use that specific semi-portable fire extinguisher and became confused in the tension created by the emergency situation. He indicated the fire extinguisher was different from others that he had been trained to use. The senior engineer who was in the engine room at the time the fire started and the Chief Engineer both indicated that they assumed the junior engineer knew how to operate the semi-portable foam extinguisher since he was an experienced mariner.

The effectiveness of the crew in isolating the engine room by stopping the ventilation and closing all the vents and doors enabled the fixed CO2 system to work as designed and extinguish the fire. Their training, experience and actions prevented further damage that could have significantly exceeded the actual damage and could have jeopardized the vessel itself said the American Club.

REPORT FINDS FAILURE TO PROPERLY DISCONNECT VEHICLE BATTERIES LED TO FIRE

The National Transportation Safety Board (NTSB) published its report on the fire aboard vehicle carrier Höegh Xiamen that resulted in $40 million worth of damage.

On June 4, 2020, about 1530 eastern daylight time, the crew of the 600-foot-long, Norwegian-flagged roll on/roll-off vehicle carrier Höegh Xiamen were preparing to depart the Blount Island Horizon Terminal in Jacksonville, Florida, en route to Baltimore, Maryland, when they saw smoke coming from a ventilation housing for one of the exhaust trunks that ran from deck 12 (the weather deck) to one of the cargo decks.

Crew members discovered a fire on deck 8, which had been loaded with used vehicles. The crew attempted to fight the fire but were repelled by heavy smoke. Shoreside fire department teams from the Jacksonville Fire and Rescue Department arrived at 1603 and relieved the crew. The captain, after consulting with and receiving concurrence from the fire department, had carbon dioxide from the vessel's fixed fire-extinguishing system released into decks 7 and 8, and the crew then evacuated from the Höegh Xiamen.

The fire continued to spread to the higher cargo decks and the accommodation. Shoreside firefighters entered cargo decks with fire hoses, and nine firefighters were subsequently injured, five of them seriously, in an explosion. Responders subsequently adopted a defensive strategy, cooling external exposed surfaces. The fire was extinguished over a week later on June 12.

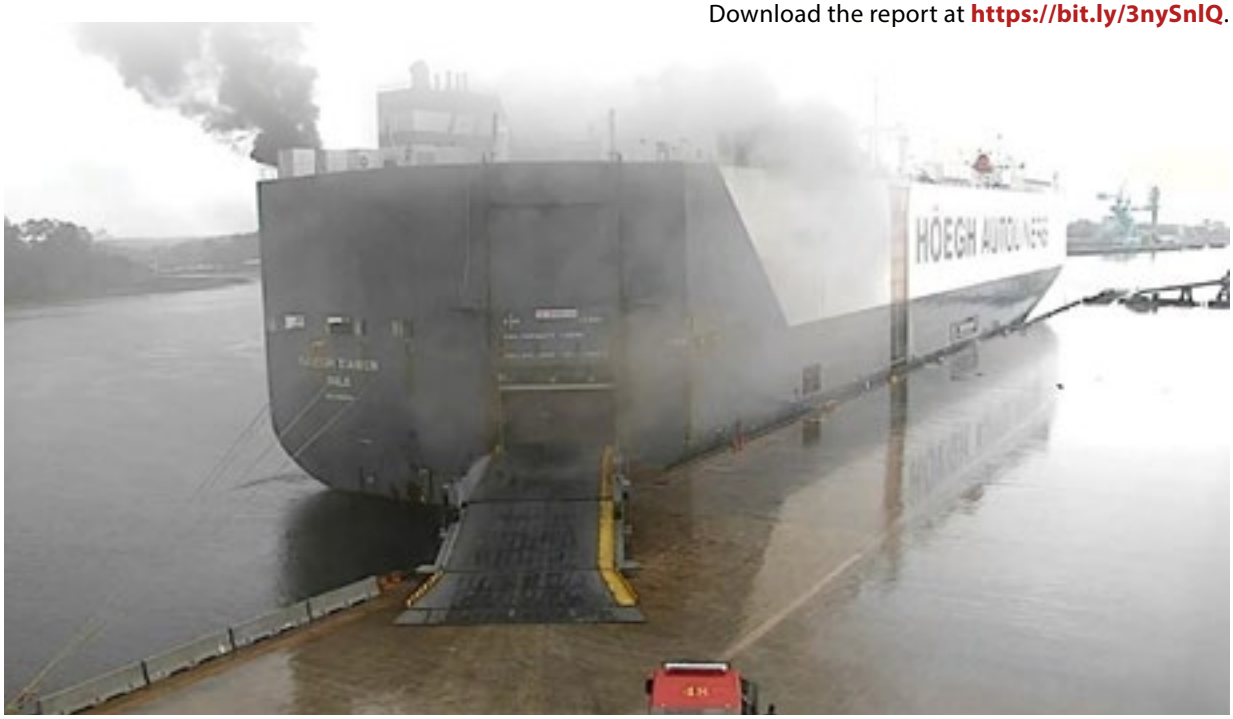
The Höegh Xiamen and its cargo of 2,420 used vehicles were declared a total loss valued at $40 million, and in August 2020, the vessel was towed to Turkey to be recycled.

Probable cause
NTSB has determined that the probable cause of the fire aboard the vehicle carrier Höegh Xiamen was Grimaldi's and SSA Atlantic's ineffective oversight of longshoremen, which did not identify that Grimaldi's vehicle battery securement procedures were not being followed, resulting in an electrical fault from an improperly disconnected battery in a used vehicle on cargo deck 8.

Contributing to the delay in the detection of the fire was the crew not immediately reactivating the vessel's fire detection system after the completion of loading.

Contributing to the extent of the fire was the master's decision to delay the release of the carbon dioxide fixed fire-extinguishing system.

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



Tritex NDT Multiple Echo Ultrasonic Thickness Gauges

The Drone Thickness Gauge
Multigauge 6000

The Underwater Thickness Gauge
Multigauge 3000

The ROV Thickness Gauge
Multigauge 4000

The Surveyors Thickness Gauge
Multigauge 5650

Tritex NDT specialize in the manufacture and supply of Multiple Echo Ultrasonic Metal Thickness Gauges, used for verifying corrosion levels and measuring metal thickness from one side only, without removing any protective coatings. The Multigauge 5650 Surveyor Gauge can measure both metal and GRP, in one gauge, and also switch from Multiple Echo to Echo - Echo with the simple press of a button, using the same probe.

Tritex NDT gives you the excellent performance that you would expect, with FREE annual calibration for the life of the gauge.

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NEW FACE AT IIMS HEAD OFFICE

Rosie Webb appointed as Office & Web Administrator at IIMS Head Office

The Institute is pleased to announce the appointment of Rosie Webb, who took up her new position as Office & Web Administrator effective from 1 March.

Rosie has joined IIMS from a veterinary reception background working in a busy Gosport clinic. When not at work, Rosie says she likes going for walks along the local beaches and through the forests with her boyfriend and their young daughter.

Rosie will be handling the inbound **info@iims.org.uk** email address and will be, for many, the first port of contact with the Institute. She will also pick up responsibility for handling and processing the many claims for Continuing Professional Development through the App. And with nearly 20 web sites to manage, Rosie will become a WordPress expert and whizz in no time!

On behalf of the IIMS Head Office Team and the members, we welcome Rosie aboard and wish her much success in her role.

TIME TO BRING YOUR CPD POINTS UP TO DATE FOR LAST YEAR

Members are reminded that they have until 31st March 2022 to bring their Continuing Professional Development (CPD) up to date for last year, or to make any late claims. Those who meet the requirements will have the CPD roundel (shown above) added to their website and Marine Surveyor Search App listings.

If you have yet to use the CPD App, it is easy to do. You are reminded to supply the necessary evidence to enable the authenticator to process your application for points without delay or rejection. If you get stuck or have questions, please email us at **info@iims.org.uk**. Access to the App can be made at **https://bit.ly/2IWcXLi** using your usual login details.

To be compliant for last year a total of 10 points are required. However, members are reminded that at last year's AGM, it was agreed that the number of points would increase to 15 this year. With this in mind and to reflect the new points structure, a new CPD points table was issued and can be downloaded at **https://bit.ly/34tVp4j**.

IIMS YACHT AND SMALL CRAFT REMOTE TONNAGE MEASUREMENT SURVEYOR TRAINING - 29TH MARCH

Last year IIMS was authorised and approved by the Maritime & Coastguard Agency (MCA) to conduct the training and subsequent approval of tonnage surveyors through online theory training (Part I) and remote practical video demonstration (Part II). This is an additional service to its existing face-to-face UK tonnage training, (currently curtailed due to the pandemic) which has been authorised by the MCA for some years. As a result of this training programme a number of new tonnage measurement surveyors have qualified and are now recognised.

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

IIMS is building on its use of technology to deliver a new methodology of authorising tonnage surveyors. As a consequence, tonnage theory training can now be offered remotely to surveyors anywhere in the world who are involved with vessels up to 24 metres.

Part I – Tonnage measurement theory seminar

Using the Zoom platform, IIMS will deliver the next live tonnage measurement theory seminar on Tuesday 29 March from 10.00 to 13.00 (UK time). The training provides a thorough explanation of UK tonnage measurement theory, including the background to tonnage and detailing the specific requirements and measurements necessary to successfully complete a tonnage measurement.

Prior to the seminar, delegates will be sent the comprehensive pdf IIMS Tonnage Training Manual. The seminar itself will be recorded. Following the presentation, all delegates will be sent the PowerPoint slides and a copy of the video as a reference. A certificate of attendance will be issued.

The cost for Part I only is £120 for members and £130 for non-members.

Part II – The practical video evidence

For those who wish to become an IIMS approved tonnage surveyor and thus able to process tonnages through the Institute, it is necessary to complete Part II, the practical evidence-based assessment leading to formal authorisation.

There are no time constraints on completing Part II and it can be done at the surveyor's convenience once Part I has been undertaken. Surveyors will be required to record short video clips (filmed by their own hand or by an attending associate) to demonstrate an understanding of the requirements and principles of conducting a tonnage measurement as taught by the theory training in Part I. IIMS will want to see video evidence of measurements being taken on a vessel in water, out of water and one with a step-deck for scrutineering. IIMS had made some sample videos to give an idea of what is expected which can be view on a YouTube playlist. Video evidence along with a completed electronic tonnage form needs to be submitted for scrutineering before authorisation is granted.

Those who become formally authorised as an IIMS MCA approved tonnage surveyor on completion of Part I and Part II will receive a formal certificate of achievement.

The cost for Part I and Part II is £275 for members and £295 for non-members.

Important note.

The MCA Tonnage Authority agreement authorises IIMS to certificate United Kingdom ships in accordance with certain applicable requirements of the legislation. Part III of the 1997 Regulations regulates the tonnage and certification of under 24 metre vessels by way of a simplified tonnage measurement system.

IIMS is currently able to process tonnage surveys on behalf of surveyors through the following registries:

British Virgin Islands

Cayman Islands

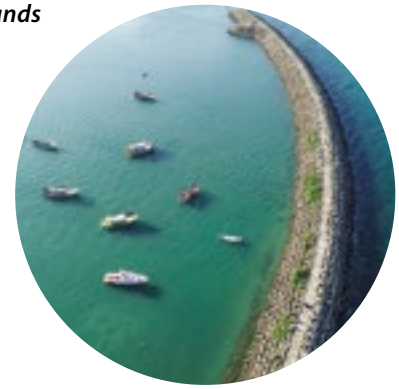
Gibraltar

Guernsey

Isle of Man

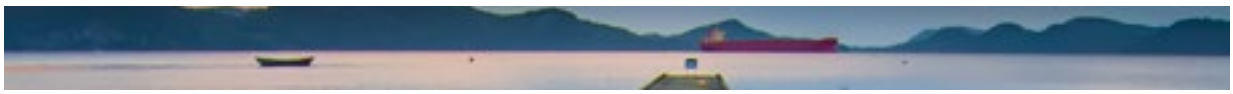
Jersey

United Kingdom



If you become authorised through IIMS training and wish to carry out tonnage surveys through registries other than those named above, please note that the Institute does not have formal agreements in place at this time. Other registries may have similar but different tonnage requirements and you should satisfy yourself before becoming formally IIMS authorized. IIMS will provide confirmation of your certification to other registries on request to help you to gain their acceptance of your capabilities as a tonnage surveyor, but IIMS cannot give a guarantee of their acceptance.

To register your place go to **https://bit.ly/3GPBV8k**. Or if you prefer not to book online, please email Vicki Loizides at education@iims.org.uk or call her on +44 23 9238 5223 and we will arrange to invoice you.



THE ROLE OF THE IIMS PROFESSIONAL ASSESSMENT COMMITTEE EXPLAINED

In the first of an occasional series on the 'inner workings' of some of the various committees within the Institute and, in the interests of transparency for existing members, the spotlight is turned on to the work of the Professional Assessment Committee (PAC) and their responsibilities. It seems that to some people, simply making an application for membership to join IIMS is all one have to do to be accepted. Whilst it could possibly be argued this might have been the case a decade or more ago, it most certainly is not the position these days. As you will learn from this short article, the process of assessing new application is taken very seriously indeed. It is thorough and rigorous.

PAC Chairman, Capt Chris Kelly, takes up the story.

"The IIMS Professional Assessment Committee currently has 16 members from around the world. All members are highly capable and experienced marine surveyors and, in the case of the commercial ship side, have backgrounds covering dry, liquid, refrigerated and gas cargoes, hull and machinery condition, salvage and towage, the offshore sector, auditing, classification and flag state surveys. Those who assess applications from large yacht and small craft surveyors have detailed knowledge and experience of this area of surveying. A further pool of experience is available from suitably experienced IIMS members who can advise on specialist areas of surveying and on the surveying practices in various parts of the world, which differ from territory to territory.

Membership applications are scrutinised by two PAC members and care is taken to ensure that the scrutineers have the necessary experience to assess the applicant's claimed areas of expertise. This can sometimes result in more than two scrutineers being involved in the assessment process.

Scrutineers look closely for evidence in the application to support the claimed areas of surveying expertise. Many applicants fail to provide sufficient relevant evidence or credible references. Examples of unsuitable evidence are claiming sea-time or irrelevant shore based marine positions as full-time surveying experience, which is of little relevance. The content of references is sometimes of a general, non-specific nature and fails to support the specific claims put forward by the applicant. This can result in prolonged communication with the applicant to verify the claimed expertise, or otherwise.

There is regular communication between the PAC members to clarify any questionable points in applications before membership is granted.

It is a fact that not all applications are successful. Some applicants fail to achieve their desired level of membership; others are not credited with their requested range of surveying classifications due to a lack of evidence. My suspicions are always aroused when an applicant claims multiple surveying classifications and rarely does their evidence stack up to support them all."

Capt Chris Kelly

PAC member and small craft surveyor, David Pestridge, comments as follows:

"The PAC serves a vital role in helping establish and maintain the credibility of the IIMS on the global maritime stage. If members are able to progress through the membership hierarchy with no checks made on their suitability, their claimed areas of expertise and the quality of their professional output, then it will only serve to dilute the Institute's standing over the long term. By having a rigorous assessment process for members wishing to upgrade or broaden their professional specialisations, we ensure that only those deemed to have reached an acceptable standard are allowed to progress and that the IIMS' own Marine Surveyor Search app delivers results that are credible and of genuine use to potential clients.

From a personal perspective, I have seen the reports of a wide range of surveyors at varying stages of their professional development from several countries. The quality of the reports, the style in which they are written, and the effectiveness of the surveyor's technique (or lack of) are all laid bare. It is only by subjecting one's work to peer review that one can really gain true insight into the current quality of that work and to identify areas for improvement. If, as is widely held, a 'surveyor lives and dies by their reports' then regular peer review enables support to be given where a professional training deficit becomes evident and to reward those operating at the top of their membership level seeking to upgrade."

David Pestridge

Capt Sanjay Bhasin, who comes from the commercial ship sector, makes some useful additional points as a PAC member. "The PAC comprises of highly experienced IIMS members who are Master Marines, marine engineers and their small craft equivalents, all of whom have had extensive experience in marine surveying. The aim of the PAC is to assess the qualifications, experience, and references of the applicant. Members of the PAC also discuss some of the issues regarding the qualifications and experience of certain applicants during PAC Quarterly meetings.

The PAC is independent of the membership marketing initiatives of IIMS, and its task is not to increase the membership of the Institute. The review of applications is not instant and considerable time is spent to carry out a proper assessment. There have been numerable cases where applicants have either been advised, after review by PAC, that their application does not meet the membership criteria at all."

Capt Sanjay Bhasin

And finally, PAC member, Mike Marshall, (also from a commercial and offshore background) sheds light on some of the detailed scrutineering undertaken to assess claimed experience which often turns up anomalies.

1. Do the passport entry/exit stamps and visas compare with CV claims, to enable the verification of the actual claims of sea service/assignments? Not always!
2. Check dates in Seamans/Discharge Book against entries in DP logbook entries in order to verify DP time.
3. Check stated Sea Time/DP to the CV and time against Seamans Book/DP logbook entries.
4. CoC's and Degree certification authenticity can be (and is) confirmed with the issuing authority. Three years ago, I was speaking with a person at the MCA, and to quote a few words from the conversation, "You would not believe the number of false CoC's going around the North Sea".
5. In my time, I have come across forged Master's Certificates and C/E Certification. On checking two job applicants once, I found the CoC's actually had the same certificate number.
6. Scrutinise the typeface and alignment of the words on all certificates, particularly Degree certification. Some years ago, we had an applicant where on the Degree certificate the applicant's name was of a different typeface to the adjacent words, and the alignment was at a different angle. Always look for points within the text which are out of the norm.
7. References are checked for authenticity. If a referee does not provide a reference given on company letterhead with a traceable address and with telephone numbers, then the reference is disregarded.

Mike Marshall

IIMS FELLOW APPOINTED AS NEW PRESIDENT FOR INTERNATIONAL SALVAGE UNION

Captain Nick Sloane HonFIIMS

The Annual General Meeting of the International Salvage Union (ISU) has appointed Captain Nicholas Sloane as its new president with James Herbert selected as next secretary general.

Captain Sloane, a director of international salvage service provider Resolve Marine has taken over as ISU president from Richard Janssen who continues as an ISU executive committee member. Mr Janssen reflected that most of his presidency was during the covid pandemic where ISU rose to the challenge acting as the global voice of the industry including "working on the important issues facing - if not threatening - our sector."

Captain Sloane, a well-known figure in the salvage industry hails from South Africa and is a Fellow of the Nautical Institute and the International Institute of Marine Surveying. He has a commendable track record in the salvage world after starting his sea career in 1980 in many roles, primarily salvage and towage, rising to become master of the South African super-tugs John Ross and Wolraad Woltemade and then salvage master. His involvement in casualties and wrecks include all classes of ships and oil rigs but probably his most notable, and highest profile reference was leading the team that raised the cruise ship Costa Concordia from the Italian island of Giglio between 2012 and 2014.

ONE-SHOT PUBLICATION FROM IIMS: 2021 SAFETY & LOSS PREVENTION BRIEFINGS COMPENDIUM

The International Institute of Marine Surveying has published a special one-shot, 100-page publication, entitled the IIMS 2021 Safety & Loss Prevention Briefings Compendium.

The broad aim of this compendium is to showcase incident and accident reports, and loss prevention measures/guidance that were issued in 2021, all easily accessible in one pdf document. Much of the content is distressing and covers carnage, destruction and sadly deaths. This new publication is an essential reference resource for any marine surveyor's online library as well as those whose work touches the surveying profession and for the wider maritime world. The many links in the publication are clickable, meaning readers can easily access more details about an item of particular interest.

Introductions by Yves Vandenborn, Director of Loss Prevention at Standard P&I Club and Geoff Waddington, IIMS President, add informative and valuable context to the publication.

Additional content has been provided from IMCA Safety Flashes with further extracts taken from the MAIB 2021 Safety Digests.

In an extract from the IIMS CEO's introduction, Mike Schwarz says,

"I have been doing this job for eight years and I remain as horrified today as I did when I first started at the sheer volume of maritime disasters that drop into my inbox each and every day.

"The stark reality is that someone will die in a marine associated accident somewhere in the world today, tomorrow, and the day after that.

"I accept that the sea is a dangerous environment in which to operate and play; furthermore, I understand that there are inherent risks associated with maritime activities, but it remains a sadness to see such loss of life and damage to valuable assets.

"And the most concerning aspect of it all is that many of the incidents you will read about should never have happened or should have been prevented.

"Human error, more often than not, is the primary cause due to incompetency, inadequate training, poor risk assessment, bad maintenance or simply a lack of common sense."

Download the compendium at **https://bit.ly/3mqDVf4**.

RECENT NEW IIMS MEMBERS

Full members

Chad Blake	*MIIMS*	British Virgin Islands
Reuben Boanes	*MIIMS*	Singapore
Robert Fleck	*MIIMS*	UK
Jasil Malliyackal	*MIIMS*	Australia
Simon May	*MIIMS*	UK
Simone Orlandini	*MIIMS*	Germany
Franciscus Schouffoer	*MIIMS*	Canada
Barney Sollars	*MIIMS*	UK
Chandrakant Sutar	*MIIMS*	India
Davis Thomas	*MIIMS*	Nambia
Victor Pena	*MIIMS*	Mexico

Technician member

Anatolijs Krjucenkovs	*TechIIMS*	Latvia

Associate members

Terrance Govender	*AssocIIMS*	South Africa
Robin Milledge	*AssocIIMS*	UK
Alexander Damaskinos	*AssocIIMS*	Cyprus

Affiliate members

Jason Caple	*AffilIIMS*	Canada
Josefine Lauridsen	*AffilIIMS*	New Zealand
Jorg Sulzer	*AffilIIMS*	Portugal
Maurits Winkel	*AffilIIMS*	Curacao
Capt. Scott Bennett	*AffilIIMS*	Canada
Paul Morris	*AffilIIMS*	UK
Marco Ravetto	*AffilIIMS*	Italy

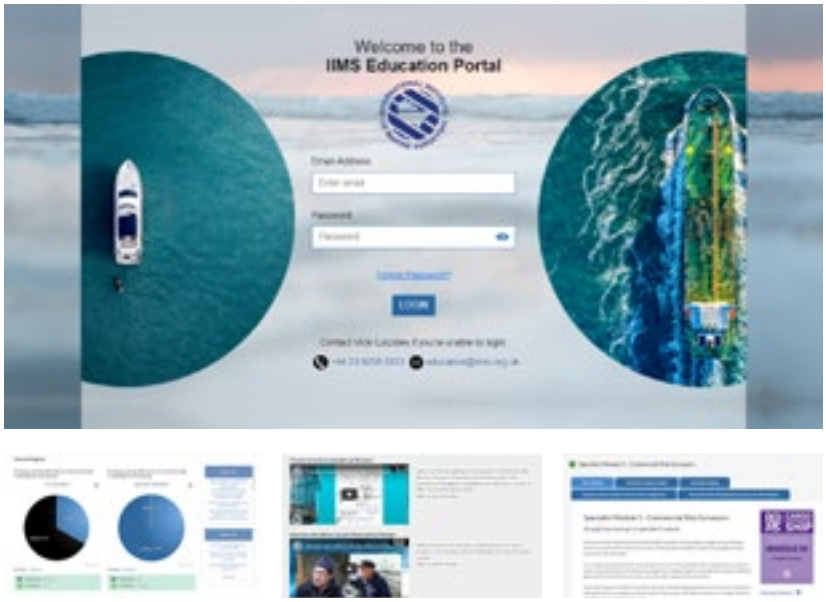
Graduate members

Russell Major	*GradIIMS*	UK
Timothy Grant	*GradIIMS*	Australia
Barry Devlin	*GradIIMS*	UK
Peter Togwell	*GradIIMS*	UK

*IIMS congratulates Russell Major and Timothy Grant for completing thier studies in the **IIMS Professional Qualification in Yacht and Small Craft Marine Surveying***

*IIMS congratulates Barry Devlin and Peter Togwell for completing thier studies in the **IIMS Professional Qualification in Commercial Ship Marine Surveying***

NEW STATE-OF THE-ART STUDENT PORTAL LAUNCHED



For more than a decade, IIMS has made use of a standalone student portal through which the two distance learning professional qualifications have been delivered. The system worked but was, to say the least, adequate and rather rudimentary with no frills.

Two years ago, the IIMS team set about developing the architecture to create a vibrant new portal, one which would enhance the study experience for the learner and automate many of the mundane, manual administrative functions.

IIMS felt it important that students (and the next generation of marine surveyors) should be given a more intimate experience as part of their studying with the Institute. The result is the roll out and launch of the new student portal in January.

INSTITUTION OF DIAGNOSTIC ENGINEERS ACQUIRED BY IIMS SUBSIDIARY

The Marine Surveying Academy Ltd (MSA), a wholly owned subsidiary of the International Institute of Marine Surveying, has announced the acquisition of the Institution of Diagnostic Engineers, to include the intellectual property, brand name and organisation's assets.

The Institution of Diagnostic Engineers (known worldwide as DIAGS) was founded in April 1981 by the late Dr. Ralph Collacott, notching up its fortieth year in 2021.

In recognition of the special knowledge and skills needed for the diagnosis of deterioration of plant and machinery and the development of faults, DIAGS was founded to promote the education, training and professional development of such persons. Dr. Collacott recognised the need for an institution to encompass all engineers dealing with diagnostics, fault finding and condition monitoring in all areas of industry, regardless of their academic qualification.

Speaking about the acquisition, the late Honorary Life President, Jeffrey Casciani-Wood, C. Eng. FRINA, FCMS, HonFIIMS, FLLA, FIDiagE., said, "The need for a professional body of this kind has never been more necessary than it is today given the transformational change the engineering profession is going through. Whilst the passing and demise of the old Institution is sad, I wish the new guardians of the DIAGS brand much success."

Commenting on the news, IIMS and MSA Chief Executive Officer, Mike Schwarz, said, "Having the opportunity to breathe new life into the unique Institution of Diagnostic Engineers excites me. It is a big responsibility and carries with it a duty to those who have been loyal and associated with the organisation, supporting it over the past 40 years. It was apparent right from the start that it is a great brand that has sadly fallen on hard times. DIAGS is a special organisation to many and one that I believe is worth saving and redeveloping."

For more information visit the DIAGS new website at **https://institutiondiagnosticengineers.org/**

Obituary:
Eur.Ing Jeffrey Casciani-Wood *CEng, FRINA, HonFIIMS, FLLA, FIDiagE*
1930-2022

by Mike Schwarz

News reached the IIMS Head Office late in the evening on 16th February to inform me that Jeffrey Casciani-Wood (aka Mog) had passed away peacefully following a short illness.

Known to many in the marine surveying and diagnostic engineering fields, Jeffrey's passing leaves a huge hole in the IIMS family. His longevity and desire to continue to contribute to Institute life into his 90s marks him out as a unique and inspirational character. He was IIMS President from 1997-2000. There are many superlative adjectives and words that could be used to describe Mog, and all would be appropriate. Words and phrases such as a heavyweight, a legend, a giant, a humourist, consummate author, 'good bloke' and gentleman all fit. But he was those things and more.

I recall on my first day in post as CEO when he rang to introduce himself. I had been sitting in the hot seat for less than 30 minutes. He introduced himself simply as Mog. I replied that's an unusual name. He responded by telling me with gusto that it stood for **Moaning Old Git** and informed me how much he enjoyed making a nuisance of himself wherever and whenever he could and how proud he was of doing so. Our exchange of banter left a mark on me. We became good friends over the years and developed a healthy professional respect for each other, although both from very different backgrounds.

Jeffrey devoted so much of his professional life to the art of marine surveying, (an industry that he cared passionately about), even well after he stopped working. He was often the first name on the attendance sheet when a new training event or online seminar was announced, such was his continuing hunger for knowledge and a desire to keep his mind active. His mind remained sharp until the end. Jeffrey's legacy will live on for many years to come through the numerous articles and papers he wrote for the Report Magazine, from his videos stored on YouTube on steel bug attack, for example, and via the handy guides written by him and published by IIMS. Indeed he told me that his ***Small Craft, Ship & Boatbuilding Terminology*** handy guide, still a steady seller, was the culmination of 50 years work.

Jeffrey was always generous with his time for newbies making their way in the profession. I would occasionally call him and ask if he could help a fresh faced student and his reply was always positive. He loved passing on his knowledge and experience.

Mog was a devoted family man and used to tease me saying he had lost count of the number of grand and great grandchildren he had and would say, "Oh by the way another is on the way." My thoughts are with his family at this time as they mourn his passing.

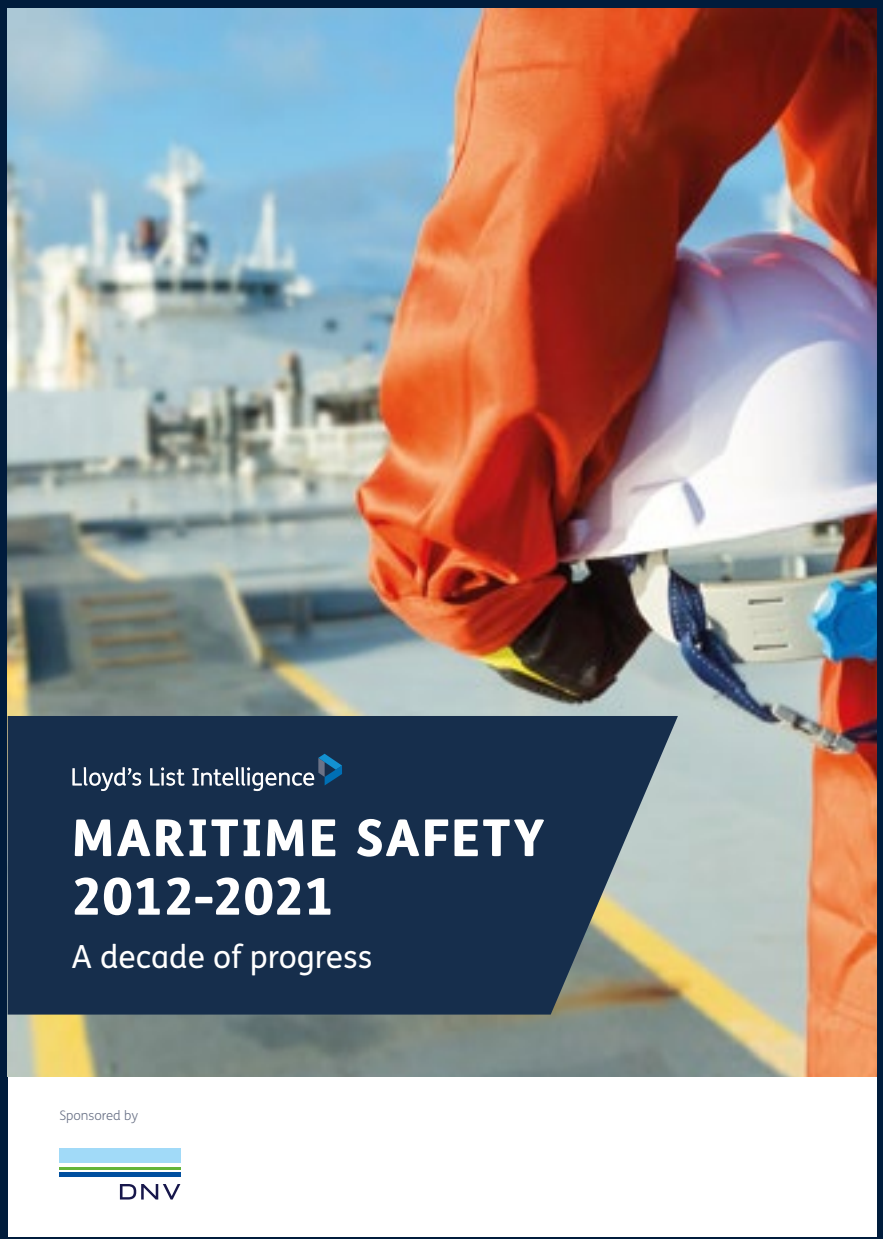
Jeffrey Casciani-Wood was 'old school' and truly a one off who will be sorely missed by all who knew him. I doubt we will see his like again and in that sense, he is irreplaceable.

Given that this obituary was written right on the publication deadline, it was not possible to include comments from others. A more detailed obituary and overview of his life with memories from those who knew him will be published in the June edition of The Report Magazine.

Rest in Peace Jeffrey.

Maritime Safety Report 2012-2021: a decade of progress

This report is a joint study by Lloyd's List Intelligence and DNV



IIMS is grateful to Lloyd's List and DNV for granting permission to print extracts from this important, in-depth new study, which assess the performance and safety record of the shipping industry over the past decade. Despite an improving picture, the detailed report echoes the need to avoid becoming complacent and warns of new challenges that lie ahead.

Shipping has seen a significant improvement in safety over the past decade as higher standards of ship construction and operation have cut the number of casualties, but emerging risks from new fuels and digital technologies must be mitigated to maintain progress, according to DNV.

It follows the release of a major new analysis, 'Maritime Safety 2012-2021: a decade of progress', from Lloyd's List Intelligence and DNV that shows a marked decline in casualties, losses and detentions over the period.

Between 2012 and 2021, the tally of annual casualties declined 20% from 1922 to 1537 and losses resulting from casualties dropped 56% from 132 in 2012 to 58 in 2020, while the number of detentions decreased by 60% by the end of 2020 – mostly in the general cargo carrier segment.

This positive trend has come even as the global fleet has increased 46% in deadweight tonnes and 16% in vessel numbers - from 116,000 to more than 130,000 ships of 100 gross tonnes and above - resulting in the number of safety incidents, as a share of the fleet, falling from nearly 5% to 2%.

"Measures such as digitized systems, modern class rules, better vessels, tighter regulatory supervision and, crucially, an improved safety culture have contributed to this welcome safety trend," said Knut Ørbeck-Nilssen, CEO of DNV Maritime.

Earlier this year, DNV warned of an emerging "safety gap" as the dual forces of decarbonization and digitalization present new hazards from alternative fuel technologies, such as fire and explosion risk, and issues like data security and increasingly complex digital systems.

"There can be no trade-off between safety and sustainability. As shipping pursues a path towards decarbonization, this will require a rethink of risk management with a renewed focus on human and organisational factors to ensure safety remains at the core of the development of new fuel systems and digitalized ways of working," Ørbeck-Nilssen continued.
Around one-third of 21,746 casualties over the 10-year period occurred with vessels aged over 25 years, with older general cargo carriers and passenger vessels accounting for the highest number of casualty incidents.
Nearly half (48%) of total casualties were due to hull and machinery (H&M) damage - with machinery issues being the main cause as hull damage accounted for only 5% - and there was a surprising increase in such incidents involving vessels between 10 and 14 years of age.

In the report, Marianne Strand Valderhaug, DNV Maritime Class director for technical support, said "the prevalence of H&M issues in the statistics remains a cause for concern".

Valderhaug highlights DNV's new Operational Reliability class notation designed to tackle the high number of machinery failures and reduce the risk of blackout by minimising functional failures in propulsion, steering, electrical power and manoeuvrability.

"The major challenge is to close the safety gap emerging from cyber threats, new technologies and new fuels. Mitigation of these risks will be vital going forward to realise the enormous potential benefits of digital and low-carbon fuel technologies for safety, efficiency and sustainability towards a goal of continuous improvement," added Ørbeck-Nilssen.

"This will require a collaborative industry effort between class, shipowners, suppliers, charterers and other stakeholders to develop holistic and human-centric solutions that support the end-user.

"The welfare of seafarers and the environment must remain central to safe and sustainable ship operations to ensure incident figures remain on a downward trend. There is no room for complacency."

And here's the Report's Executive Summary in full authored by Chris Pålsson, Head of Consulting, Lloyd's List Intelligence.

This comprehensive report into maritime safety is based upon data drawn from the decade spanning 2012-2021, up to the mid-point of 2021. Using the unique databases of Lloyd's List Intelligence, we have reviewed 866,000 inspections, 26,000 detentions, 22,000 casualty incidents, and 1,000 losses. Through interrogation of that data, we have identified a gratifying, overall pattern of improvement in maritime safety, although there can be no room or time for complacency, and critical issues lie ahead for shipping. However, it does no harm to look at what has been achieved as a result of targeted and consolidated effort, even as the industry seeks solutions for future issues to be confronted.

Enhancements to safety and environmental protection in the past decade have been remarkable. In the early 1990s, the global shipping fleet was losing vessels at a rate of 200-300 each year. The current rate of attrition is between 50 and 100 vessels a year. This is even more remarkable given the fact that there are almost 130,000 ships in the global fleet (100 gross tons+) compared with just 80,000 ships some 30 years ago. Much has happened in the past ten years to which this report refers.

Machinery damage the peak casualty cause

In January 2015, the sulphur limits in the SECAs (sulphur emission control areas) were capped to 0.1%. Five years later, a global sulphur cap of 0.5% entered into force. Consequently, more fuel types have entered the market to make it possible for ship operators to comply with regulations.

The long-term impact of the new fuels on ships' engines may not yet be fully known, but it is known that machinery damage is the most common cause of casualty. Engine designers and other stakeholders must, and will, follow this development closely. The route to decarbonisation tops the agenda as much for shipping as it does for other sectors of the global economy. There is great uncertainty about how ships should be fuelled, propelled, and designed to meet both future environmental targets and business demands.

LNG has been the alternative fuel of choice over the past 10 years, with high numbers recorded for 2021, thus positioning LNG as a relevant fuel for many. Ships ordered with electro fuels, hybrid, or fully electric drives are on the increase, and further solutions are likely to emerge. Every one of these solutions brings a requirement to evaluate all safety aspects.

Pandemic impact on safety

Shipping has not been immune to the impact of Covid-19. Indeed, much to the delight of the often 'unsung' world of shipping, the global community has been made even more aware of the importance of seaborne trade logistics through pandemic-related supply chain problems.

Passenger shipping, in all its forms, was immediately and heavily impacted by the pandemic. Because passenger vessels are involved in a relatively high share of safety incidents, particularly machinery damage and contacts, those numbers dropped as activity stopped.

Tanker shipping activity followed a different track. Oil prices plunged in the northern spring of 2020 and trade intensified as oil market stakeholders seized the opportunity to stock up at low prices. Many tankers were chartered for storage.

Container carriers saw activity drop early in 2020 as China went into lockdown. As China gradually opened, Europe and the US shut down. Stocks continued to pile up, with serious disruptions to the supply chain worldwide. Basic services were gradually reinstated, but challenges quickly mounted, with stockpiles, reduced capacities in ports, limited availability of trucking, labour shortages and a shortage of containers. Charter and freight rates surged.

Idle ships were taken into service and new ship ordering regained momentum.

It was challenging to change crew as travelling was heavily restricted. There were many examples of crew being stuck onboard ships for months longer than planned.

In 2020, unrelated to the pandemic, the 200,00 dwt bulk carrier Wakashio ran aground on a reef southeast of Mauritius in July. The ship later broke into two. At the time, the crew had been onboard the ship much longer than usual due to the pandemic. One year later, they were still in Mauritius, held in custody without charge. The ITF called on the Mauritius government to release the crew.

One of the most disastrous incidents in 2020 was the explosion on 4 August in Beirut port, Lebanon. The explosion destroyed port infrastructure, killed 200 and injured more than 6,500 people. Several ships in port were also damaged. The passenger vessel Orient Queen was severely damaged at berth. The ship later listed, capsized, and sank.

Navigational safety drew global attention in 2021 through the plight of the Ever Given. The container ship ran aground in the Suez Canal on 23 March, blocking canal traffic for six days. The incident headlined the news agenda around the world as the importance of free-flowing maritime traffic suddenly became evident to everyone.

Downward trend for detentions

The average number of vessels inspected each year between 2012 and 2019 was 94,800. Fewer inspections were carried out in 2020 because of the pandemic. The overall trend for the period from 2012 onwards reveals a decline in the number of inspections despite a steady growth of the global fleet. While this is true for the entire fleet, the underlying details show a slightly different trend.

The number of inspections is increasing for the growing fleets of bulk carriers, container ships and gas carriers, and are on a sustained level for other tankers. However, fleets which are declining in number are seeing a diminishing number of inspections.

Gratifyingly, inspections that lead to detentions are following a clear downward trend. By 2019, detentions were 40% fewer than in 2012, a remarkable reduction. The number of detained ships was down for all vessel types, but most of all for general cargo carriers. Over the years, general cargo carriers have been the most detained vessels, but since 2019 detained general cargo carrier numbers are on about the same level as bulk carriers. In that context, it should be mentioned that there are almost twice as many inspections of bulk carriers than of general cargo carriers, so the share of inspected ships that lead to detention is still higher for general cargo carriers.

The world fleet consists of 130,000 ships of 100 gt and above, aggregating 1.56 billion gt. By number of ships, slightly more than half (54%) of the fleet was built since the turn of the millennium. However, in terms of gt, fully 88% of the fleet has been built since 2012. So, in general terms, large ships are young and old ships are small. (see Figure 1 showing world fleet age profile by gt and year built).

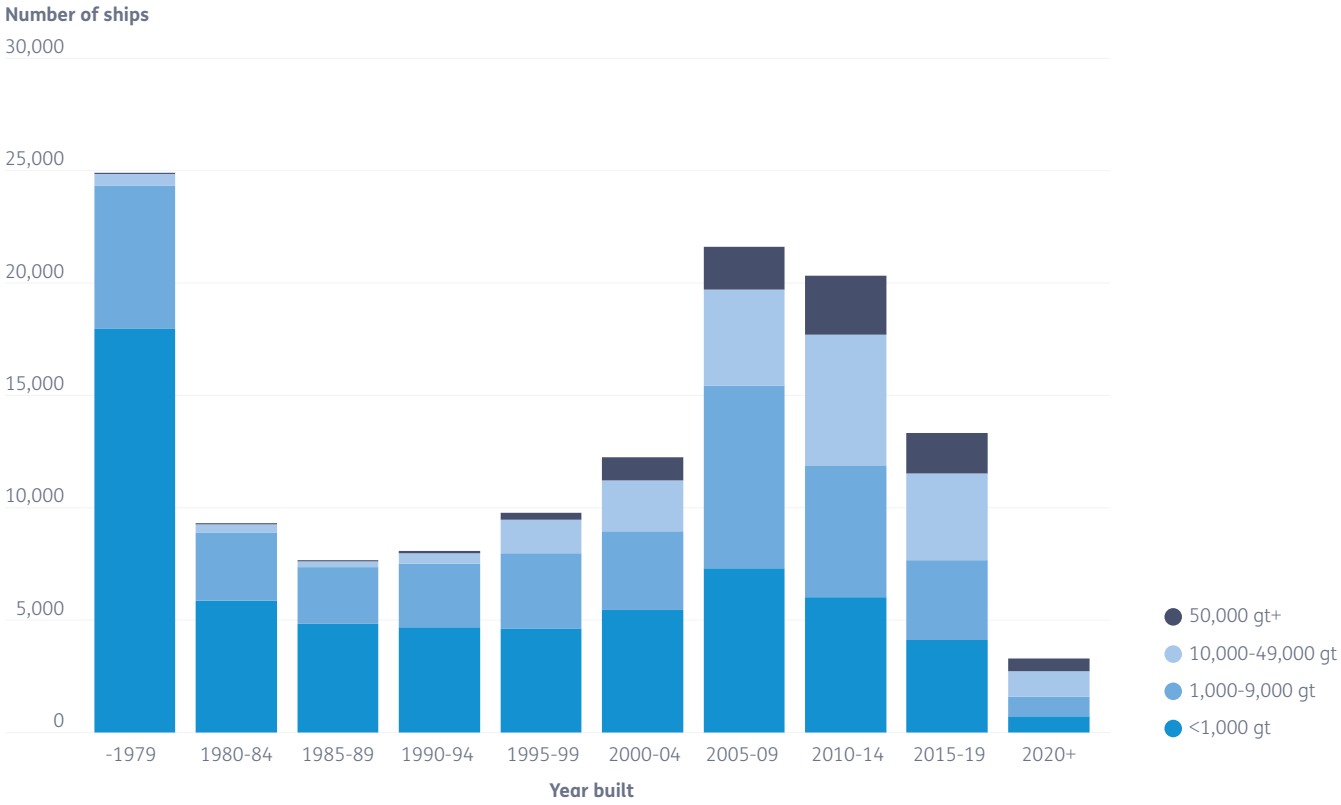


Figure 1: World fleet age profile by gt and year built

2014 or 2017? A peak year for casualties

Most detained vessels are small, below 10,000 gt, and close to half of the small vessels are 25 years or older. When ships reach the second half of their lifecycles, it is common for ownership and flag to change, so ships end up with smaller shipowners. That might mean ships receive better care and are properly maintained, but there are risks too; resources are limited in tougher times, with resulting implications for the frequency of service, maintenance, and repair.

A total of 21,746 casualties were recorded over the past decade. The year 2017 saw the greatest number of casualties, although when the number of casualties are calculated in relation to the size of the fleet in any given year, the peak year was 2014. Casualty numbers have declined since 2017, and the incident rate has declined since 2014.

While machinery damage continues to be the main cause of casualties, as mentioned above, there is not enough detailed data evidence yet to make a definitive determination as to why this is, but factors such as new fuels, change of speed and other measures to remain compliant with EEXI and CII could increase the risk of machinery failure and damage.

One of these factors, bunker fuel quality, is expected to emerge as an increasing source of scrutiny in incident reporting as more fuel types become available on the market. In recent years, low sulphur fuels and LNG have become widely offered. Bio-fuels and electrofuels are still relatively rare but will be more readily available in the near term. The potential impact on the frequency of machinery damage is uncertain, but fuels and lubricants specialists have issued warnings.

Ship engines perform best when running at ratings defined by the engine designers. The engine should match the ship's size and targeted design speed. In the past decade, ship speeds have been reduced to save fuel and costs. If slow steaming is maintained for months or years, there will be an impact on engine reliability. The seriousness of this impact depends on how slow and for how long the ships are ordered to operate at those speeds.

Lloyd's List Intelligence records identify in excess of 8,000 different engine designations. Many of them are variations of the same engine family, but that reflects the many and unique engines available. It is too early and too diversified to accurately forecast how hard the impact of fuel switch will be on each engine type.

The highest number of casualty incidents involve general cargo carriers and passenger vessels. As mentioned above, these are large fleets with a significant share of old and small vessels. These are often low-margin business operations, which compromises fleet renewal. A contributing factor is that parts of passenger vessel services for river crossings or connections with archipelagos are frequently operated by public entities. Public funding is generally constrained, and contracts commonly awarded to the lowest bidder. Those low bids, more often than not, are backed by older ships with lower capital costs.

Newbuilding prices on the rise

The ultimate failure for maritime safety is when a ship is lost, and people onboard lose their lives. While fewer passenger ships are being lost, every lost vessel is one too many. Climate change is leading to more extreme weather and weather events, which must be understood and for which preparations will have to be made in order to protect lives and livelihoods.

Ship designs to match rougher weather conditions may run up against environmental targets. Stronger engines and more robust hull constructions lead to higher energy consumption. Upgraded ship designs and construction materials will be needed to meet both requirements, and newbuilding prices will therefore likely increase. Small and old vessels are more likely to be lost than larger, newer ships. Passenger vessel losses result in more deaths than for any other vessel type, simply because there are more people onboard than just the crew. However, not many passenger vessels are lost, and the trend is for fewer losses year by year. When they are lost, the number of deaths is high.

As this report outlines, the trend in maritime safety is positive: life at sea is becoming safer. However, I see many safety challenges ahead, so the successful safety work of the past must be intensified to keep the trend line pointing in the right direction. All stakeholders collectively own this challenge. It is a matter of design, functionality, technology, knowledge, training, attitude, and many other factors. Let us make our best even better.

Download the full report at **https://bit.ly/33HKN16**.
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THE FUTURE OF MARINE SURVEYING

by Hans de Koning

The marine surveying business always has been very traditional. A large number of surveyors work alone or in small business, they go to a vessel and write a report about their findings. Every surveyor company has his or her own reporting format and expertise. As experienced during the 2020 Covid pandemic, travel restrictions are increasing the need for, and development of, modern techniques, like remote surveying. Just recently, techniques like ballast tank inspections by Remote Operated Vehicle, digital reporting, and certification have been introduced by classification societies and flag states. Given the most recent developments it can be expected that the sector is finally to develop from very traditional to most likely, web-based platforms like Uber or Airbnb with more standardized service and remote data collection. Technology developments could change the role and importance of the Marine Surveyor if anticipated upon.

I will discuss the several factors that will influence the future of Marine Surveying and create new opportunities...

Improvement of Remote Surveying

When the COVID-19 pandemic hit the world in 2020, travel became more complicated and to many locations impossible. On the first instance, attendance to the vessel by superintendents and classification or flag state surveyors was postponed, and temporarily certificates were being issued. On case-to-case bases, local surveyors are being appointed to substitute for superintendents. ISM audits and later flag state and classification surveys were being conducted remotely with crew members taking pictures or videos from the subject items. However more structural and generally accepted methods and protocols for remote surveying are needed.

Autonomous vessels

The maritime world is moving towards autonomous or semi-autonomous vessels. Internet of Things (IoT) applications will become more common in ship management data supply, and crew interference will be reduced over time. In case vessels have less to no crew, alternative sources for data collection and on-board handling formerly done by crew will be needed, and local surveyors may play a role to fill this gap.

According to Kretschmann et al. (2017) in their article "Analysing the economic benefit of unmanned autonomous ships: "An exploratory cost-comparison between an autonomous and a conventional bulk carrier" the difference in cost of owning and operating an unmanned bulk carrier over 25 years accumulate to a USD 4.3 million below the costs for a conventional bulk carrier. A crew of 9 is considered to board prior to arriving in port to conduct the ship handling, mooring and cargo operations.

Developments in scale

There is a tendency of a few marine surveying companies providing services worldwide by having a network of local surveyors. For example, Sinotech states at their website that they cover 55% of the Shipping Asset Condition and Risk Assessment Services in Asia https://www.sinotechmarine.com/truly-global-served-shipping-clients-in-23-countries-in-may-19/

Idwal Marine started with condition surveys in 2010 and developed a global network of 360 surveyors conducting around 1.000 inspections in 2018, which has developed to close to 2.000 inspections in 2020 www.idwalmarine.com (accessed 4 January 2021)

Inchcape, a shipping agency, is offering a single point of contact for a worldwide marine surveying network https://www.iss-shipping.com/products-and-services/marine-survey-and-inspection (accessed 4 January 2021)

BMT https://www.bmt.org/industries/surveys/ is claiming to serve more than 250 ports with a network of over 500 surveyors and specialised in, amongst others, Audits and Inspections, Marine casualty and claims investigations.

The larger the company, the larger the budget for product and technology development as well as for sales and marketing. Simply saying, a company selling the production of 300 surveyors has, in general, more considerable financial means than a company with three surveyors. The result of this will be that the market will be divided into small companies providing services for larger companies and the same larger companies which will determine price, technology, and quality.

Client requirements

For my MBA dissertation research, I have interviewed a group of typical Surveyor's clients.

- Insurance, Claims Division Managers, Claim Handlers, Correspondence Managers or Loss Prevention Managers with Hull and Machinery (H&M) or P&I insurers.
- Fleet Managers and Superintendents of Shipmanagement companies.

During the interviews, three categories of questions have been asked; Are you happy with the average quality of Marine Surveyors? Would you prefer to work with a single -regional- point of contact instead of maintaining an extensive network? And would remote surveying supported by a local surveyor be an option or solution to be considered?

Of the H&M and P&I interviewees none is expecting large technology developments in the near future, other than platform-based reporting. They don't expect a large change in their network and prefer to maintain their own network of local correspondents who are appointing the surveyors. They prefer to work with physical attendance instead of remote techniques. The interviewees indicated that there are large differences in surveying and reporting quality, especially in Africa and the Caribbean. In case of major damages, they prefer to fly in a qualified surveyor from the Northern America or Europe. This is expensive, and several interviewees indicated that a good quality, network of -local- surveyors is considered preferred above flying in surveyors from abroad.

Of the fleet managers and superintendent interviewees, 80% indicated that they are generally satisfied with the surveyors they are working with. The remaining 20% indicated that surveyors and inspections, including those for Classification and Flag, are considered a burden and without any added value.

All fleet managers and superintendent interviewees have experience with remote surveys done by the classification society or flag state. The typical comment is that the classification society charges the same for a remote survey as for a physical inspection, which was considered unfair. The experience of time required for an inspection differs per flag state or Classification Society, but the general observation is that a thorough remote inspection requires more time than a physical inspection. In case the remote inspection was less time consuming it lacked the in-depth quality of a physical inspection. The general conclusion of all interviewees is that matters can be easily overlooked or hidden with a remote inspection.

All interviewees confirmed that accreditation is important for a local surveyor. If a local surveyor has sufficient accreditations, such as ISO certification or membership of an acknowledge association, they will prefer to work with a local surveyor instead of a global operator. In case a single point of contact would cover various ports in a region, this would be preferred. The objection against using a local surveyor is that a local surveyor might have local interests and therefore might not let the client's interest prevail.

Local surveyors can act on behalf of owners and managers as their local eyes and ears according to all interviewees, although they will not be able to replace all superintendent visits. One of the aspects of a superintendent's visit is the human aspect and being the link between the ship and shore organisation. This aspect can be partly replaced by video conferencing. Smaller operators prefer physical attendance above video conferencing.

Costs are a concern to all; local surveyor attendance is preferred if cost-effective, preferably cost saving.

Findings

When the world of travel came to an abrupt standstill in March 2020, my expectation was that it would be a lost year because many inspections were conducted outside of the country. The factor I overlooked was that no one could travel. Not to the country where I am based either. The result was a shift from work abroad to work locally. The same happened with the work I usually did abroad, which now is being done by local surveyors. It is expected that this situation will remain. Clients now have been forced to be more creative with their solutions for attending vessels and realized that these solutions are more economical.

A contributing factor is the development of remote survey techniques. Although not being very high-tech, a good internet connection is the main requirement, it appeared to be useful although having its negative aspects as well. From the interviews done with ship managers and insurers, the main comments heard was that remote inspections for class or flag are very time consuming, not objective, and often an -additional- burden to the crew. A local surveyor can be of added value to assist during remote inspections.

Physical attendance to vessels remains important for interpersonal contacts and collections of information. Alternatives can be and will be considered to avoid travel and related costs as well as manhours.

From the interviews, we can conclude that local surveyors can contribute to information gathering for ship managers and insurers. This outside of the normal scope of work with the surveyor becoming a local technical representative or observer. The main objection against this is the assumed lack of reliability combined with local interests that are not always in line with the clients' interests. I have learned from the interviews that the surveying company's credibility can partly compensate for this objection.

The most considerable change in technology I expect not to be in surveying technics; this will be limited to life video and the use of drones. The most significant change will be coming from the use of technology required for autonomous ships. Currently, autonomous ships are being used in short sea or local operations such as liners between two known ports or ferries since it relies on stable internet connections. As soon as stable internet can be provided globally, the first expected vessels to become globally operational autonomous most likely will be bulk carriers. Autonomous vessels calling ports will need attendance, and on this role, a surveying company could anticipate.

Another significant development will be related to the growth of companies' scale. The most significant factor in this aspect is the marketing and product development strength of global operating companies. It can be expected that information sharing as well as surveyor selection and appointments will become more and more platform based, comparable the way Airbnb and Uber work already. From the interviews held, it appears that ship managers are more likely to work with a network surveyor than insurance, which is slightly more conservative. Therefore, the biggest competition with the global working surveying companies can be expected in the market of ship managers, operators, and charterers.

Conclusion

Global working companies have a larger market penetration capacity due to their networks and budgets. The interviews and document research carried out are indicating that clients' demand from the insurance market will not drastically change in the short term. The travel restrictions and technology developments are resulting in increased demand from ship managers and operators for more local based surveyors. The tendency of ship management companies to increase scale and larger companies' preference to seek larger business partners is evident. The scale increase and travel reduction will lead to the conclusion that a global or regional surveyor's network with a single point of contact will be of added value to the ship operators and managers market and the insurers market, especially in case of more significant claims. Added value can also be found in interpersonal contact and reduction of costs for travel and manhours. With good marketing, focussed on technology, reputation, and consistent quality, a global or regional operating surveyor's company can gain market share in the insurance market and ship managers and operator's market. This improved market position will be advantageous in the long term when the market for autonomous or semi-autonomous vessels will develop.

Today's maritime surveying companies will have to make a strategic choice to be a follower or a leader, the Airbnb host or Airbnb. To develop, adapt and anticipate on changing circumstances and technology or be a service provider using the technologies provided by those who developed the platform. Both options are just as good but will need a different focus and business model.

ALUMINIUM VERSUS STEEL BOAT HULLS DISCUSSION

Contributions by Mike Schooley, Ruben Donaque and Mike Adams, K&M Maritime

One of the primary questions that naval architects and yacht designers will likely ask a potential owner when considering a new build yacht is what metal the hull should be made from.

ADVANTAGES OF ALUMINIUM BOAT HULLS OVER STEEL BOAT HULLS

There are several advantages of working with aluminium in superyacht construction projects. Not only is it light and strong, but it also has increased corrosion resistance and is flexible to work with. From a shipyard's point of view, it's a great material to use. It can be cut with power tools, dressed with a router, filed and shaped easily.

Mike Schooley from Ruben Donaque, a marine metal repair and fabrication business agreed, he said, "Aluminium, is light and 'clean' to work with". This means that aluminium is quicker to fabricate and weld than steel, resulting in labour and cost savings.

Schooley went on to say, "Some yacht metal fabricators tend to be afraid of welding aluminium, but if the fabricator is Lloyd's certified and has the adequate machinery it should not be a daunting task."

Aluminium hulls do not need protective paint

A major advantage of aluminium hulls is that they do not necessarily need painting, except below the waterline or where fixtures and fittings are touching the hull surface. Bare aluminium forms an aluminium oxide coating on its surface that creates a barrier and prevents the metal from corroding. This results in a huge cost saving.

Aluminium hulls weigh about 30% less than steel hulls

One of the biggest benefits of building a yacht out of aluminium is the performance output. Aluminium weighs about 30% less than an equivalent steel hull. Reduced weight means it's easier for the boat to travel through water, which makes it faster and more fuel efficient.

Aluminium hulls have an increased resale value

An appealing factor is that an aluminium boat will often have a much higher resale value than a steel boat.

DISADVANTAGES OF ALUMINIUM HULLS COMPARED TO STEEL HULLS

As flexible as it is, there are also several disadvantages of using aluminium in superyacht construction.

Aluminium boat hulls cost more

The biggest disadvantage of using aluminium for a boat hull is the cost. Tonne for tonne, the cost of aluminium is much greater than steel. According to Quandl.com at the time of writing, the cost of aluminium is $1,480 dollars per tonne. However, steel is a much more reasonable $50 dollars per tonne.

Aluminium requires special corrosion care

Although it does not necessarily require complete painting, aluminium is anodic to all other commonly used metals (except zinc and magnesium). Simply put, unless protected, it will start to corrode. This means aluminium hulls require special bottom paint, since the copper in most antifouling bottom paints will react with the aluminium and corrode it.

Steel is more 'noble' than aluminium, making it less prone to electrolysis and allowing a steel hull to use regular copper bottom antifoul paint. Read more in our guide on yacht antifouling paint here.

Aluminium creates reduced comfort on board

Superyacht owners may find the reduced comfort of aluminium hulls a concern while travelling the globe. Aluminium hulls can result in a noisy uncomfortable ride, due mainly to the featherlight nature of aluminium, which in some hulls would result in a lot of motion. Some owners may therefore prefer that their boats are built in steel, provided that the design has adequate displacement and stability to carry the added structural weight. This results in greater distribution of weight and a more comfortable ride.

WHY CHOOSE STEEL FOR MARINE CONSTRUCTION?

Steel hulls have better abrasion resistance

One big advantage of using steel in boat building and construction is that it's much more rugged than aluminium, being tougher and having much superior abrasion resistance when compared to any other boat building material.
Abrasion resistance is the ability of a material to withstand actions such as rubbing, scraping, or erosion that tends progressively to remove material from its surface. Such ability helps to maintain the material's original appearance and structure.

Steel is a material that is more widely used

It's widely known that, in most places, there are more materials and equipped metal workers to perform repairs and installations in steel over aluminium. An owner may find it much more difficult to perform repairs of aluminium hulls in remote places.

WHICH IS BETTER, STEEL BOAT HULLS OR ALUMINIUM BOAT HULLS?

This is a difficult question to answer definitively, as the choice of aluminium vs. steel completely depends on the design of the boat and what it is largely used for. For example, a racing boat built for speed makes aluminium the better choice because of the weight saving and performance increase. An explorer yacht on the other hand will require a hull that is much more durable, and that's where steel's abrasive resistance will be needed.

Mike Adams from K&M Maritime sums this all up beautifully when he says, "Both steel and aluminium hulls have their own advantages and merits, whether it be yield and tensile strengths and lightness in the case of aluminium. With proper corrosion protection, when applied correctly, means these materials have many years durability, whatever the hull is built from."

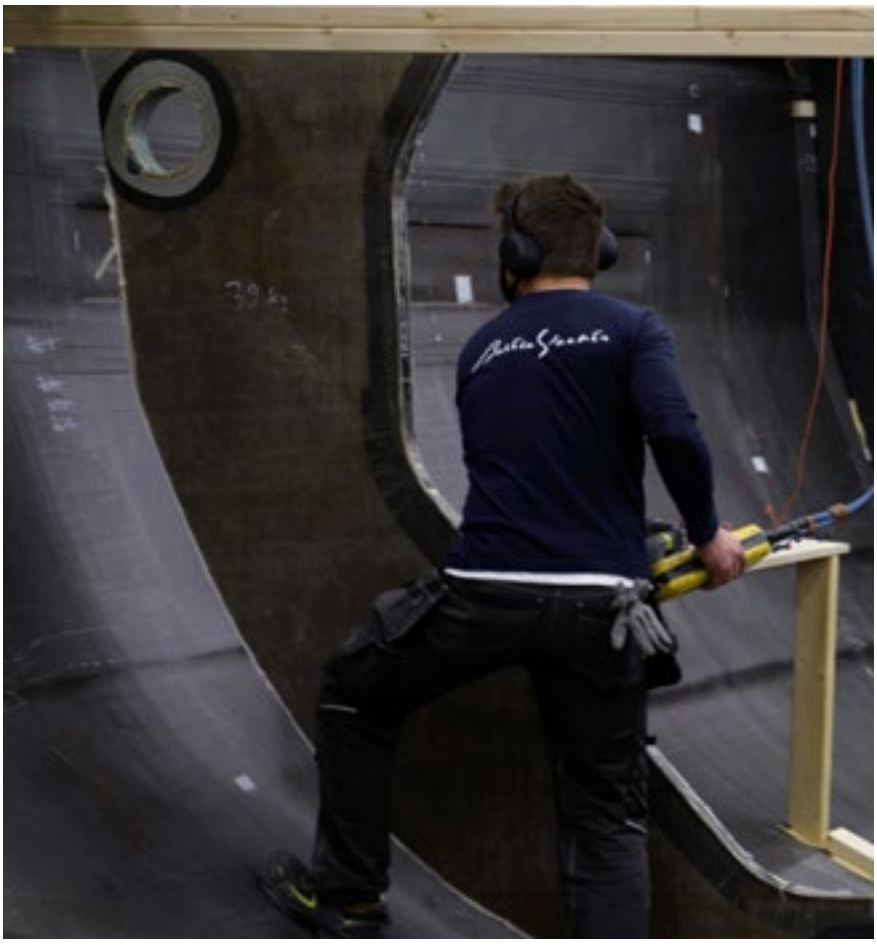
The realisation that a superyacht dream is soon set to become reality is an exciting time for any new or existing yacht owner, as he or she works to find a design and build team who can understand and interpret their vision. Whether they opt for a steel or aluminium hull, it's important they hire a naval architect or yacht designer who understands their vision and goals.

*Article first published at Yachting Pages - **https://yachting-pages.com/** - and reprinted here with our thanks.*

Material obsession

From wood to window frames and rock – boatbuilding has never been so eclectic.

Sam Fortescue reports



Gone are the days when becoming a boatbuilder meant a few years at technical college or an apprenticeship with a master craftsman. Those hallowed manual skills are still required, of course, but the cutting edge of boat design has as much to do with materials, science and chemistry. And never more so than now, when sustainability is on everybody's lips.

If you have been fortunate enough to make it to a boat show over the past year, you'll see that the art of boatbuilding is in rude good shape. But new materials and new techniques are blurring lines and making it hard to compare one boat with another. Take wood, for instance: the material of boatbuilding choice for millennia. There are still plenty of wooden boat builders out there, labouring away to craft pilot cutters, rowing skiffs and other emblematic vessels of yesteryear. But among the best known of the wooden boatbuilders is Spirit Yachts in Ipswich, building thoroughly modern boats - in wood composite.

"We use epoxy resin to bond the components together, but the amount of resin used is minute compared to GRP or carbon," says founder and head designer Sean McMillan. "Both carbon fibre and GRP... rely totally on being saturated with a high density of polyester or epoxy resins to impart structural integrity." In fact, the 1600kg Spirit 30 daysailer employs just 73kg of resin and 12.2kg of hardener in its entire construction.

France's RM Yachts also uses wood to build its famously swift offshore hulls, designed by Marc Lombard. They are built in plywood and epoxy, which is flexible, robust and far more sustainable than standard glass-reinforced plastic. Sheets of laser cut Okoumé plywood up to 22mm thick are bent around a mould and epoxied to plywood structural members. The whole lot is also epoxy sheathed for longevity.

It's a technique which means that the brand-new RM 1380 will weigh in at a decent 9.8 tonnes light – slightly less than the comparable X4-6 from X-Yachts. "Plywood is the soul of an RM. It a very useful material, allying a good stiffness with lightness - perfect for building the hull and the structure," says head of engineering Edouard Delamare. "But plywood is nothing without epoxy, because it ensures the waterproofing – vital in a marine environment."

Glass reinforced plastic

Many series production yards, from Beneteau to Bavaria, still use the most basic form of wet lay-up – splurging resin on to mats of glassfibre with a roller to get them well wetted out before laying down the next layer of glass. It is hard to control how much resin is applied and there are often air pockets between layers. For this reason, hulls built this way tend to be overbuilt and heavier.

Polyester is the cheapest and most commonly used resin, but it can bond with water, creating the problem of osmosis. That's why isopthalic gelcoats are applied to the outside of the hull, to act as an effective barrier to moisture. Vinylester creates many more bonds than polyester and is reckoned to be up to three times stronger, but it costs more too. And epoxy is the best performing resin of all, used only in high-quality lay-ups.

Spirit Yachts on the advantages of wood
Sean McMillan

"As a basic material, wood is infinitely renewable. All our timber comes from responsibly managed forests and is FSC certified. If there is any doubt over the source or sustainability of a certain timber (teak for example) and how it is being managed, then we look for alternatives.

"The life expectancy for a well-built contemporary wooden yacht is very long. It is no coincidence that nearly all the surviving great classics are wooden and they were built long before the advent of modern techniques. On that basis, there is no reason to suppose that the life of our yachts should not be well in excess of 100 years. My early yachts are already some 35 years old with no signs of degeneration.

"Whilst we do use a thin layer of epoxy to sheath our hulls, at the point of the yacht's end of life this layer could be stripped off, and the remaining timber recycled. Factor in the huge difficulties in recycling modern production yachts and the idea that they are 'sustainable' in comparison to a wooden yacht is laughable. In 20 years' time, when GRP has become socially unacceptable, who knows, we may look back and see the last 60 years of GRP boats as a historical niche."

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Infusion

When vacuum infusion emerged as an industrial technique in 1990, it offered a step-up because it allowed boatbuilders to use less resin and yet create greater stiffness in the finished panel. The resin is spread much more evenly throughout the laminate, but it generates a lot of waste, because each infused part has to be prepared with a host of plastic layers. Besides the plastic of the vacuum bag itself, there's a breather layer to distribute the resin and a peel ply to stop it sticking to the infused part; there's a thick bead of sealant tape; disposable feeder tubes are required every few inches, and many of the vacuum tubes are also single use.

The technology hasn't stood still, though, and there are now re-usable vacuum bags made from inert silicon, for instance. Some bags have the mesh structure necessary to spread the resin built in, while the aerospace sector has pioneered the use of a PTFE membrane that keeps tubing clean for re-use.

Sweden's Arcona builds its fast cruisers using vacuum infusion, and has for many years. Improving lamination techniques have stripped weight out of the boats, such that the current Arcona 40 displaces a full tonne less than its equivalent a decade earlier. And that's in spite of the steel support frame laminated in amidships.

Other boatbuilders use other types of reinforcing for the high-load areas of the hull. Aramids like Kevlar often feature, as does carbon fibre on stringers and around keel bolts and chainplates. High-end yacht builder Baltic uses carbon reinforcing in its hulls, for instance, to add strength without adding weight. And performance catamaran brand Catana uses both Twaron and carbon in its lay-up. It saves an impressive 700kg of glass in the Catana 47.

Pre-preg

The bulk and waste of the infusion process has led to another step forward in the form of so-called pre-preg materials, where the fibre sheets of the hull come ready coated with a pre-catalysed form of the resin that reacts very slowly at room temperature. Instead of needing to mix epoxy with hardener and reduce its viscosity with toxic styrene to draw into the mould, a precisely controlled curing process activates and sets the resin. The result is a stronger, lighter laminate than can be produced through wet lay-up.

Gurit's SPRINT system goes a step further by sandwiching a thin film of heat-activated resin between two layers of fibre. The advantage of this is that the fibres remain dry until curing so air can be more easily removed under vacuum to produce a laminate with a void content of less than 0.5 per cent. Baltic Yachts uses this technique, building an oven around its hulls to cure them. "With one or two exceptions, we haven't infused a boat for some time," says CEO Henry Hawkins. "Using Sprint and pre-preg materials saves weight compared to vacuum infusion. With hand lay-up, generally more resin is mixed than needed and a lot gets discarded. This is the same with infusion where resin is lost/ wasted in the plastic hoses and pipes and breather film and within the distribution channels."

Even at this sharp end of the composite business, rapid advances are being made – driven by aerospace and Formula One. "We can now take away the expensive autoclaves and ovens – they can cure at ambient or 40-60 degrees," says Ashley Parkinson – a research engineer with the UK National Composites Centre. "It's a more expensive process to use, but in the high-performance market, it's worth it."

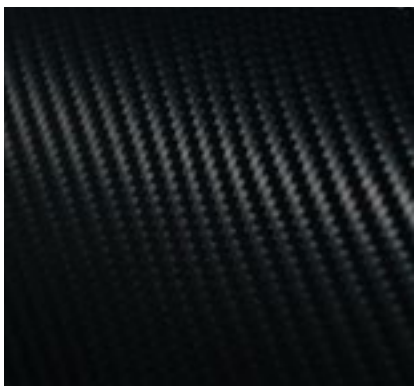
Greener composites

Now, there's nothing particularly sustainable about producing glass fibre – a technique that basically involves heating the raw silica to 1370 degrees C, then pultruding the molten strands onto a bobbin. And high-modulus carbon fibre is even worse, requiring more than 2000 degrees C.

Swiss supplier Bcomp tested alternative natural fibres 10 years ago, when it was a start-up in a garage. "Flax turned out to be best in terms of mechanical properties, soil usage, water requirements and overall performance," explains marine and industry manager Paolo Dassi. It actually locks up carbon rather than producing it – as much as 500g of CO2 per kilogram of flax. "The plant acts as a CO2 sink during its growth. This allows us to completely offset the emissions of the manufacturing stages."

Bcomp's breakthrough was to process the flax stems to be of uniform size and flatness, replicating the grades possible using glassfibre. Its AmpliTex product is available as a unidirectional, stitched biaxial or woven twill, ranging from 200-500gsm. In lamination it is 50 per cent stiffer than glass and just a little weaker, making it an ideal substitute. Couple this with an extra flax mesh called PowerRibs, and you end up with a composite with characteristics similar to carbon, but with just 25 per cent of the emissions.

AmpliTex has already been used in some niche boatbuilding projects, including the glorious Flax 27 daysailer built by Green Boats of Bremen, which also sports cork decking. It was a key part of the lay-up of the new Café Racer 68 from Baltic Yachts, where 50 per cent of the structural members were in flax composite.



France's Windelo has taken a different tack with its catamarans. It uses basalt fibre – made from melted volcanic rock – which it says is slightly stronger than E-glass and just one-tenth as carbon intensive to produce and use. Its first yacht is a 50-footer whose hull also features a recycled PET foam core for strength and stiffness.

But it's not just the fibre that is being decarbonised. So-called 'green epoxies' have been developed, where a significant chunk of the synthetic oil-derived molecules of the resin are replaced by bio-sourced molecules. It's 40 per cent in Gurit's Ampro for hand laminating and up to 30 per cent in the ProSet range from West Systems, and they can just be dropped in to replace the equivalent synthetic resin.

"Any customer that is familiar with epoxy processing – vacuum consolidation and/or post curing will be very familiar with the process," says David Johnson of Wessex Resins – European manufacturer for West. "Even wet lay-up with no vacuum bagging."

There is a modest cost increase, but it amounts to less than 25 per cent compared to a standard epoxy, and a drop in the ocean of the boat's overall build. "Bio based epoxies are more expensive because there's more sophisticated chemistry involved," says Johnson.

Suppliers like Gurit are also finding ways to substitute the synthetic foam core used in sandwich hull construction. Standard foam is made of virgin PVC, with all the associated environmental pitfalls. There are other types with different properties, but Gurit has developed more renewable alternatives using up to 100 per cent recycled PVC and balsa wood.

Recycling composite

All forms of composite suffer from the same fundamental problem. At the end of their lives, it is very difficult to separate the component materials for re-use. Various 'recycling' systems are being developed, including pyrolysis, burning and shredding, but they are all unsatisfactory because of the energy intensity of the processes or the fact that they yield a lower quality material that has to be downcycled.

Arkema has developed a breakthrough resin that can be collected, refined and reused when the end-of-life composite is heated. Called Elium, it is already the key ingredient in recyclable wind turbine blades, and has been used to build a stout mini-Transat racer, a multi 50 and a 25ft fast cruiser. The recovery process also yields reusable glass, but carbon and flax can't stand the heat: carbon loses as much as two-thirds of its strength and flax simply combusts.

However, a recent Australian study has shown how carbon fibre composite can first be heated without oxygen in a pyrolysis chamber to burn off resin, then oxidised to yield carbon fibre with most of the strength of virgin fibre but only 10 per cent of the environmental impact. As long as this reduction in strength is clearly modelled, it is possible to design accordingly.

Cured laminates can also be separated using a chemical process – a process proven in the lab at the National Composites Centre, using a big vat of acetic acid.

Portsmouth University is researching enzymes to decompose plastic. "You have to find the right enzyme that works for snipping the molecules of a particular polymer. Practically, it's a decade away," says Ashley Parkinson of the NCC.

Away from composites

Some innovative new boat builders are eschewing composites altogether. Start-up Vaan is building its 42ft R4 catamaran out of a grade of aluminium alloy commonly used in window frames and road signs, so as much as 60 per cent of the hull is already recycled. "There's no way to distinguish it from virgin material," says Vaan founder Igor Kluin. It hasn't been easy to secure supplies, however. "In the short-term the costs are higher because there are so many people jumping on the bandwagon, but it has only 5 per cent of the energy use of virgin alloy, so in the end it should be cheaper."

Vaan's novel approach to sourcing more sustainable materials extends to the interior finish as well. It uses a pineapple leaf fabric instead of leather, plentiful European poplar for cabinetry, cork decking and recycled PET. Parts of the boat are even 3D printed. "Recycled industrial PET is being 3D printed for the back of the Vaan spoiler because it produces a lower volume than moulding," says Kluin. "We want to see if it can become load bearing. We're also 3D printing with aluminium, too. It's useful for smaller structural elements that are hard to reach and would traditionally have been milled."

It's a brave new world when boats can be made of rock or melted back into resin and fibre. But with so much concern about growing mountains of waste, it should be no surprise that "plastic" boats are under the spotlight. And for marine surveyors, it all translates into a broader requirements for understanding novel building techniques and their merits.

Baltic's 68ft 'Café Racer'

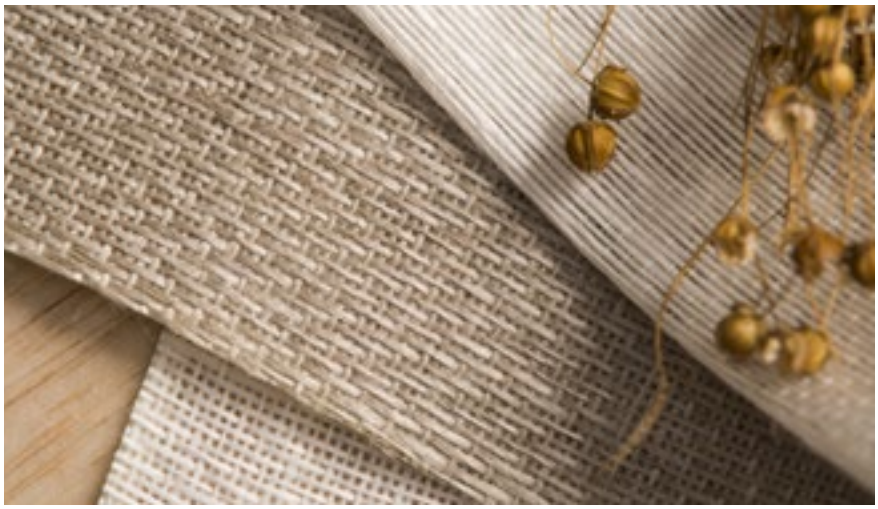
Finland's Baltic Yachts is known for its luxurious custom and semi-custom sailing boats. It recently launched the first hull of its Café Racer project, which breaks fresh ground in a number of areas.

First, it is the largest yacht yet to feature the major use of flax composite – notably in the structural members of the boat. This alone pays tribute to the remarkable mechanical properties of flax fibre. The PET foam core from Armacell is made of plastic bottles whose colours make it impractical to reuse.

Propulsion comes via two 15kW electric drives which are capable of regenerating power under sail. A range extender will also form part of the line-up, designed to use biofuel or hydrogen. Solar panels in the coach roof are capable of running the air-con in eco mode, which has been engineered to use 30 per cent less power.

Her towering rig requires no fixed or running backstays, relying instead on a wide shroud base and swept back spreaders for support. Carbo-Link standing rigging is aerodynamically shaped to reduce windage. And the deck is covered with sustainable cork instead of hardwood.

The boat's interior has not been neglected, either, with styling from Jens Paulus and Design Unlimited. Materials such as flax, linen and leather continue the boat's eco credentials below. Accommodation includes a cavernous saloon and an owner's suite forward, with a decent galley and a guest cabin in the quarter.



Sam Fortescue's Bio

Sam has been writing about boats for over a decade, and sailing for ever. An erstwhile editor of the UK's *Sailing Today* magazine, he now writes freelance for some of the best-known titles in the business. His commissions take him from the bilges of trampolines of fast foiling catamarans to the rarified interiors of the world's most luxurious superyachts, via all the oily detail and gleaming technology that lies in between. When he's not writing about boats, he is often aboard his own 34-footer with the family, exploring the Baltic.

Superyacht building boom creates a supply crunch and crew shortage for ultrarich buyers

By Robert Frank, CNBC Reporter and Editor

Robert Frank is an award-winning journalist, best-selling author and a leading authority on the American wealthy.

More than 1,000 superyachts are now in production or on order, as the global ultrarich seek refuge from crowds and Covid-19 on their nine-figure floating palaces.

According to Boat International's 2022 Global Order Book, a record 1,024 superyachts - defined as yachts longer than 80 feet - are in construction or on order, up 25% over the year-earlier period, surpassing a 2008 peak. With shipyards straining to keep up with demand, wealthy buyers are being told they have to wait three to five years for custom orders.

"The shipyards are very full," said Jonathan Beckett, CEO of Burgess, a yacht brokerage and management firm. "They are doing their best to satisfy customer requirements, but it's not easy.

From Jeff Bezos' new 416-foot sailing yacht to Project Black Shark, a mysterious 252-foot yacht designed with a "shark-like skin," the sheer number and size of vessels under construction is unprecedented, according to industry executives. The total length of superyachts scheduled to be delivered by 2026 would stretch more than 24 miles, according to Boat International.

Superyachts can cost anywhere from $2 million to $3 million to more than $500 million depending on their size and complexity.

Most of the demand is coming from the U.S., where soaring stock markets, IPOs, SPAC deals and crypto gains have created trillions of dollars of wealth during the pandemic, Beckett said. The U.S. has 500 more billionaires now than it did before

the pandemic, ending the year with around 2,755, according to Forbes.

Many of the new and existing ultrarich accelerated their plans to buy a superyacht over the past two years amid growing concerns about public health, Beckett said.

"Covid made people sit up and re-evaluate their lives," Beckett said. "A lot of our clients felt impenetrable and secure, and I think Covid made them feel vulnerable. So they said, 'Why put off for another five or 10 years buying a yacht and enjoying myself with my family, when I could be doing it today?' "

The rush has created shortages of crew, dock space and shipyards. Yacht builders around the world - but mainly in Italy, the Netherlands and Germany - are struggling with labour and material shortages, and space constraints.

According to Boat International, superyacht inventory is sold for 2022, most of it for 2023 and "2024 is already being eyed on the semi-custom front." The number of boats started without owners - or "on spec" - is now the lowest on record.

While prices in the superyacht industry are highly variable and opaque, demand is pushing prices higher, Beckett said.

"Prices for new 'builds' are going up," he said. "It's difficult for shipyards to quote a fixed price, since the cost of materials may escalate over the next 12 to 24 months, but at the end of the day everyone wants a fixed-price contract."

Today's state-of-the-art superyachts have typical amenities like pools, helipads, Jet Ski garages and gyms, but some include the sought-after "beach club" — a massive leisure space at the stern that has retractable balconies, lounge decks, spas and dining areas that offer easy access to and from the water.

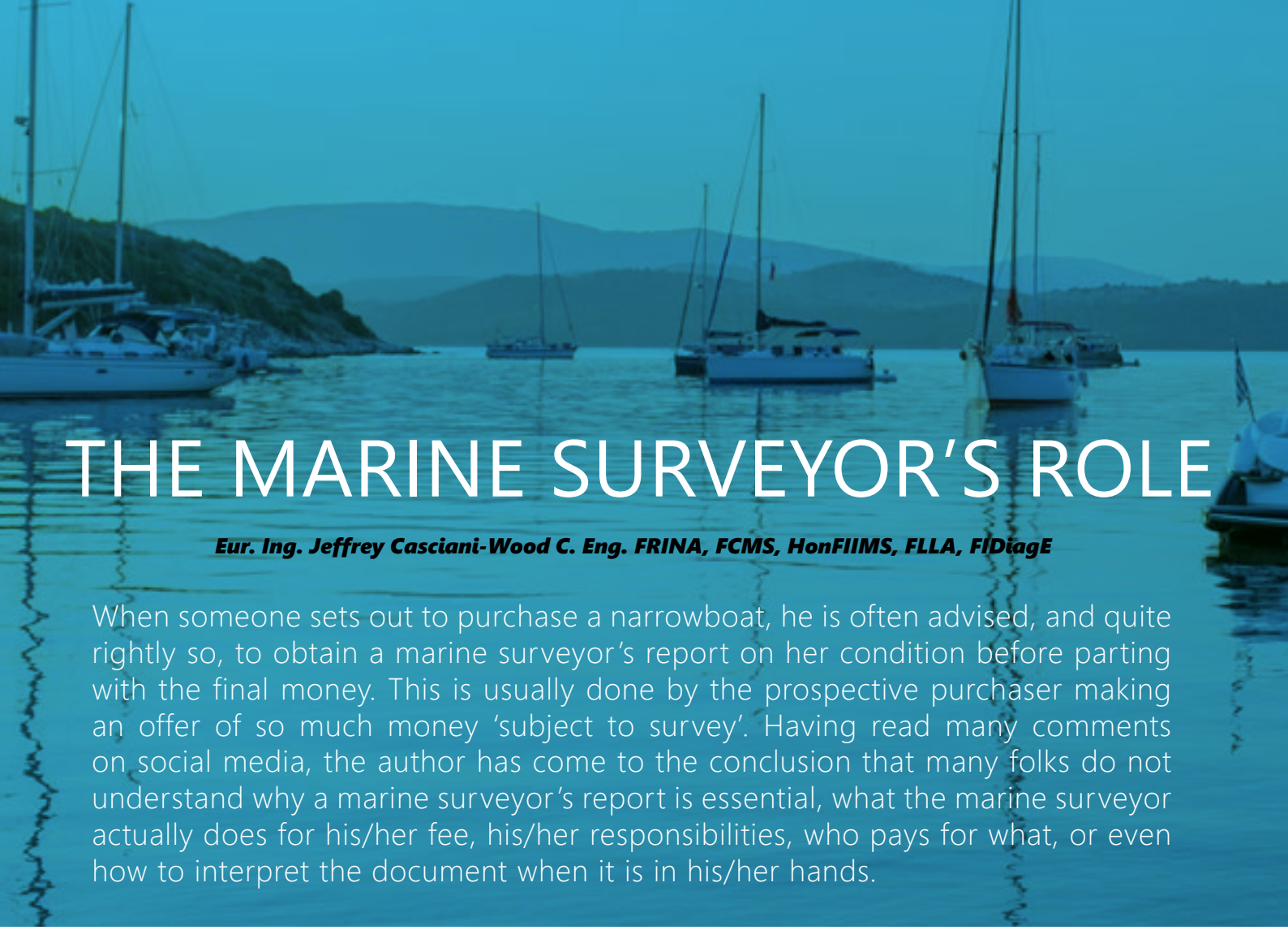
The largest motor superyacht to be delivered this year was the 464-foot "Nord," built by Germany's Lurssen Yachts. It has a retractable helicopter hangar, a sports and diving centre, 14 custom tenders (the boats used to go to and from the vessel) and a submarine.

A growing number of buyers are ordering "expedition" superyachts, which are sturdy, military-like explorers that can sail through ice, storms and harsh conditions to explore remote corners of the world. Orders for them jumped 33% this year, according to Boat International.

Beckett said that buyers of these types of superyachts value them in the same way they do adventure vehicles like Land Rovers and the Mercedes-AMG G 63 SUV.

"Expedition yachts are a trend," Beckett said. "People like the look of them, but people who buy expedition yachts usually don't go on many expeditions. They're more likely to be anchored off [the French Riviera's] Cap Ferrat."

*Article originally published on the CNBC website at **https://www.cnbc.com/** and reprinted here with thanks.*



THE MARINE SURVEYOR'S ROLE

Eur. Ing. Jeffrey Casciani-Wood C. Eng. FRINA, FCMS, HonFIIMS, FLLA, FIDiagE

When someone sets out to purchase a narrowboat, he is often advised, and quite rightly so, to obtain a marine surveyor's report on her condition before parting with the final money. This is usually done by the prospective purchaser making an offer of so much money 'subject to survey'. Having read many comments on social media, the author has come to the conclusion that many folks do not understand why a marine surveyor's report is essential, what the marine surveyor actually does for his/her fee, his/her responsibilities, who pays for what, or even how to interpret the document when it is in his/her hands.

The first thing that the prospective purchaser should realise is that there are a number of important pros and cons that he/she should understand before instructing a marine surveyor.

1. This document is written with English law in mind and so applies to England, Wales, and Northern Ireland. It does not apply in Scotland where Scottish law applies. Beware! Scottish law is very different to English law and is based on different fundamental principles.

2. He/she should never rely on a previous report prepared for the seller of the boat as the marine surveyor concerned does not owe him/her, the purchaser, a duty of care. Furthermore, the content of such a report, in English law, remains the intellectual property of the marine surveyor concerned regardless of who actually paid for the document and in using such a survey report, the buyer is breeching that marine surveyor's copyright.

3. He/she should also never use a marine surveyor recommended by the seller or broker as that may involve the marine surveyor concerned in a conflict of interest.

The prospective purchaser can obtain a list of marine surveyors stationed within the area where he intends to buy the boat from one of the marine surveying technical institutions such as the International Institute of Marine Surveying. Persons who have practising corporate membership of such an Institute are required to carry Professional Indemnity Insurance and recommended to practice continuous professional development (CPD). Another, perhaps more subtle point, is that, not only should the prospective buyer ask the marine surveyor about his PI and CPD position, but he/she should also ask him/her about his/her personal experience of the type of boat under consideration. A marine surveyor who has spent his/her time surveying boats built of wood or FRP may be a very good marine surveyor indeed, but may know next to nothing about steel, its production, its peculiarities, and conversion into a seaworthy boat.

The next thing that the prospective buyer should ask for is a copy of the marine surveyor's terms and conditions. That is very important as they will show the limits that the marine surveyor puts on his/her work and possibly also what is expected of the purchaser. If they are published on the marine surveyor's web site, the buyer should download

a copy, write on it the date that he/she did that and keep it in the boat's file. In the event of the purchase going awry and finishing up in Court, the Court will assume, in the absence of any other evidence, that the purchaser has read and understood those terms and conditions.

Under English law, a marine survey contract consists of three items. They are:

1. An offer which includes the marine surveyor's terms and conditions,

2. An acceptance of that offer by the purchaser,

3. What the law calls a consideration which is the marine surveyor's fee and reasonable expenses.

The buyer must understand that it is his/her responsibility to get the boat to the place where she is going to be drydocked, slipped, or otherwise hauled from the water. The costs of that and any extra shoring and/or opening up work to give the marine surveyor reasonable access to all parts of the boat are also down to him/her, together with the costs of returning her afterwards in her original condition to her original berth. He/she must also ensure that the boat arrives at the place where she is to be surveyed and on the agreed date.

Again, under English law, the marine surveyor must use reasonable skill in carrying out the work and, most importantly, he/she owes the purchaser a duty of care. *If he/she knows before he/she starts work* that the purchaser intends to use the report to obtain finance to buy the boat or to cover her with insurance, then he/she also owes the same duty of care to the financier and the underwriter concerned. That duty of care not only is the actual work of carrying out the survey but also the reporting of the results. Care should be particularly taken, for example, in obtaining the hull dimensions. They should be *measured* in accordance with ISO8666 and give the vessel's overall length, the hull length, the overall breadth, the hull depth, the draughts at each end of the vessel and her actual freeboard amidships on both sides. He/she should also report in full the boat's name, the details of any Registration Numbers, Boat Safety Certificate, and RCD Certificate of Conformity.

The four areas where problems are most likely to arise are:

1. The freshwater tank,
2. The rudder tube,
3. The stern tube,
4. The cabin sole and bilge area under.

On many narrowboats the freshwater tank is built into the forward structure of the boat, the top by the flat forming the bottom of the forward well deck or cockpit and the after end by the lower part of the forward cabin bulkhead. The latter is often built of only 3 mm thick steel plate. Access into the tank is by means of a bolted watertight hatch cover in the well deck flat. The tank is regularly filled with tap water and emptied so that the water is replaced by air coming down the filling and/or overflow pipes. They are ideal conditions for the steel internal structure to develop haematite rust. The tank lid is very rarely opened, and the heel of the cabin bulkhead is usually hidden behind permanently fixed wooden linings. It is not unknown for that bulkhead heel to rust through allowing the water to leak into the space between the bottom plate of the hull and the underside of the cabin sole. Marine surveyors on a pre-purchase survey very rarely see the tank opened or that bulkhead lining taken down. Even more rarely do they take UTS measurements of the tank top. Unless the tank is opened and the lining removed from the bulkhead, it is not possible to examine the tank's internal steelwork, or to comment on the condition of the bulkhead. The only means that the marine surveyor has of assessing the condition of the interior of the tank is a heavy hammer test and closely spaced UTS readings of the side shell in way of the tank. Incidentally, the side shell in way of the tank is one of the few places where UTS readings are likely to show meaningful readings.

To open the lid, take down the lining, clean and recoat the tank and box up afterward costs money to the buyer's account. In the author's opinion, however, such a built-in tank should be opened, cleaned, recoated and boxed up at no more than five-year intervals.

Most modern narrowboats have the fuel tank built into the counter by a solid oil tight bulkhead built just

astern of the weed box in the counter. The rudderstock passes through a solid drawn steel tube with the lower end in the uxter plate and the upper one in the after deck. That tube is internally inaccessible, as it is not possible to open the fuel tank. After an initial painting when the boat is built, the inside of that tube also very rarely indeed gets any attention as, without involving the cost of removing the rudder, it also is inaccessible. When the boat is moving, the canal water moves up and down inside the tube again giving ideal conditions for haematite rust to develop. If the tube gets holed, as is sometimes the case, not only does the fuel leak into the canal but also the canal water leaks into the fuel. With the rudder and stock in place, it is impossible for the marine surveyor to inspect or in any way test that tube for leaks. That situation could be classed as a design fault upon which the marine surveyor is not in any position to comment, but, again, in the author's opinion, the rudder should be dismounted, the tube examined, dealt with, and boxed up every two years. That would be another item to the buyer's cost.

The stern gear is another case in point. This usually consists of the propeller carried on the outer end of the propeller or tail end shaft supported by a Cutless bearing with some form of gland inside the hull and with the tail shaft connected by a bolted flange to the after end of the gear box. A Cutless bearing is a brass tube lined with hard, (cutless), fluted, butyl rubber and entered by a push fit into the stern frame of the boat and secured there by some form of locking arrangement. The flutes allow the bearing to be canal water cooled. The flutes usually get worn down by the rotation of the propeller allowing the shaft end to droop and increasing the water (and grit) inflow into the bearing. The simplest form of gland on the inside of the boat consists of a stuffing box with three or four turns of abrasive packing rope held in place by a bolted collar. There are several variations on the internal stern gear arrangements. If the stern gland weeps, (it should have a small drip once every 45 seconds or so but no more) then the bolts held in the gland ring should be tightened evenly till the drip reached reasonable amounts. Frequently, the gland is overtightened with the result that the packing rope is pushed hard against the steel shaft, wearing a deep circumferential groove into it. The author has seen such a tail end shaft with a groove so deep that he could lay his none too small forefinger into it. A disaster waiting to happen which would result in the loss of the propeller and, possibly, the loss of the boat. In the author's opinion, the tail shaft should be opened up, the propeller and shaft removed and given a close up, hands on, examination by a recognised, competent person at no more than two-year intervals and, in any case, the wear down of the Cutless bearing should be measured and recorded every time the boat is taken from the water. Again, an extra cost to the buyer's account.

The fourth area where problems may arise is the cabin sole (often incorrectly called the floor by newbies). The cabin sole should be cut with easily portable hatches to enable inspection of the ballast, the inside of the bottom plate and the steel floors that support it. It rarely is, so that inspection of the items in the space underneath is impossible. Those spaces often get wet with the water coming from various sources with the inevitable rusting and corrosion of the inaccessible steelwork and various forms of rot in any woodwork. There is no way that a marine surveyor can discover and report on such faults in those conditions.

What, then, is the marine surveyor's responsibility?

To those that he/she knows before he/she starts work will rely on his report, under well-established English case law, he/she owes a two-fold duty of care.

1. He/she must use the best of his/her knowledge and ability to be careful in carrying out the actual work of survey,

2. He/she must be equally careful in reporting in an easily read and understood manner, the results of that work.

Marine surveyors have a duty of care to their clients and that is the result of a number of cases that have been heard in the Courts and especially Hedley Byrne and Co Ltd., v Heller and Partners Ltd [1964] AC 465 where the House of Lords ruled:

> *" if, in a sphere where a person is so placed that others could reasonably rely on his judgement or on his skill or on his ability to make careful enquiry, such a person takes it on himself to give information or advice to, or allow his information or advice to be passed on to, another person who, as he knows or should know, will place reliance on it, then a duty of care will arise."*

That is the starting point of the duty of care, and it applies to all professionals including marine surveyors. Not even expert witnesses have immunity from being sued over matters arising in the course of proceedings following a landmark ruling in the Supreme Court: *Jones* **v** *Kaney* **[2011] UKSC 134**. That decision overruled the four-century old protection that gave expert witnesses immunity from suit for breach of the duty of care whether in contract or negligence matters when they are participating in legal proceedings. Professionals do not have immunity in their everyday jobs and being an expert witness is just another job.

In order to contain the risk of a discontented client suing for whatever reason, the marine surveyor should, *inter alia*: -

- Never give an opinion as a favour or do a favour
- Stay professional at all times
- Where applicable, use any necessary caveats
- Always follow up such conversations in writing. Such written material is vital contemporaneous evidence of what was actually said and/or intended,
- He/she should always make sure that he/she sticks to his/her instructions,
- He/she should make sure that his/her contract covers the work he/she is going to undertake.

The marine surveyor may often be tempted to go outside his/her area of expertise. It is not uncommon, for example, for a client to ask a legal question or to lead the marine surveyor into such areas. Such a temptation must be resisted, and he/she should stick to providing facts and/or an opinion that a marine surveyor would ordinarily be required to provide in the circumstances. He/she should not provide quasi legal advice such as an opinion as to whether a person or entity may be liable or negligent. That is for lawyers, barristers, and the judge to determine in their conclusions based on the facts that the marine surveyor has provided combined with case law. That is their area of expertise.

Remember that anyone may have an opinion, right or wrong, and may make a negligent misstatement of facts. In practice, the marine surveyor accused of forgetting his/her duty of care is usually sued for negligent misstatement.

What, then, should a normal pre-purchase survey cover?

A good survey report for either pre-purchase or insurance purposes on a narrowboat should cover at least the following main parts of the boat, her machinery, and outfit as appropriate:

- *Measurement* of the boat's principal dimensions including the depth and freeboard,
- Hull structure, keel, shell plating or skin including ultrasonic thickness measurements of the skin *and* all primary and secondary supporting structure, frames, beams, stringers, flats, bulkheads, stiffeners *etc.*, *etc.*, as far as they are reasonably accessible,
- Ballast whether loose or fixed,
- Bottom and topside coatings,
- The cathodic protection scheme,
- The deck, flats and their supporting structures,
- Superstructure(s) and cabin,
- Hatches, companionways, weather, or watertight doors,
- Harpins and rubbing strakes,
- Deck equipment and fittings,
- Guard and grab rails,
- Heating and ventilation system,
- Windows, ports and scuttles,
- An internal hull examination – compartment by compartment,
- Skin fittings and sea valves,
- Steering gear, rudder, and hangings,
- Ground tackle and windlass if fitted including the ranging and measurement of the cables,

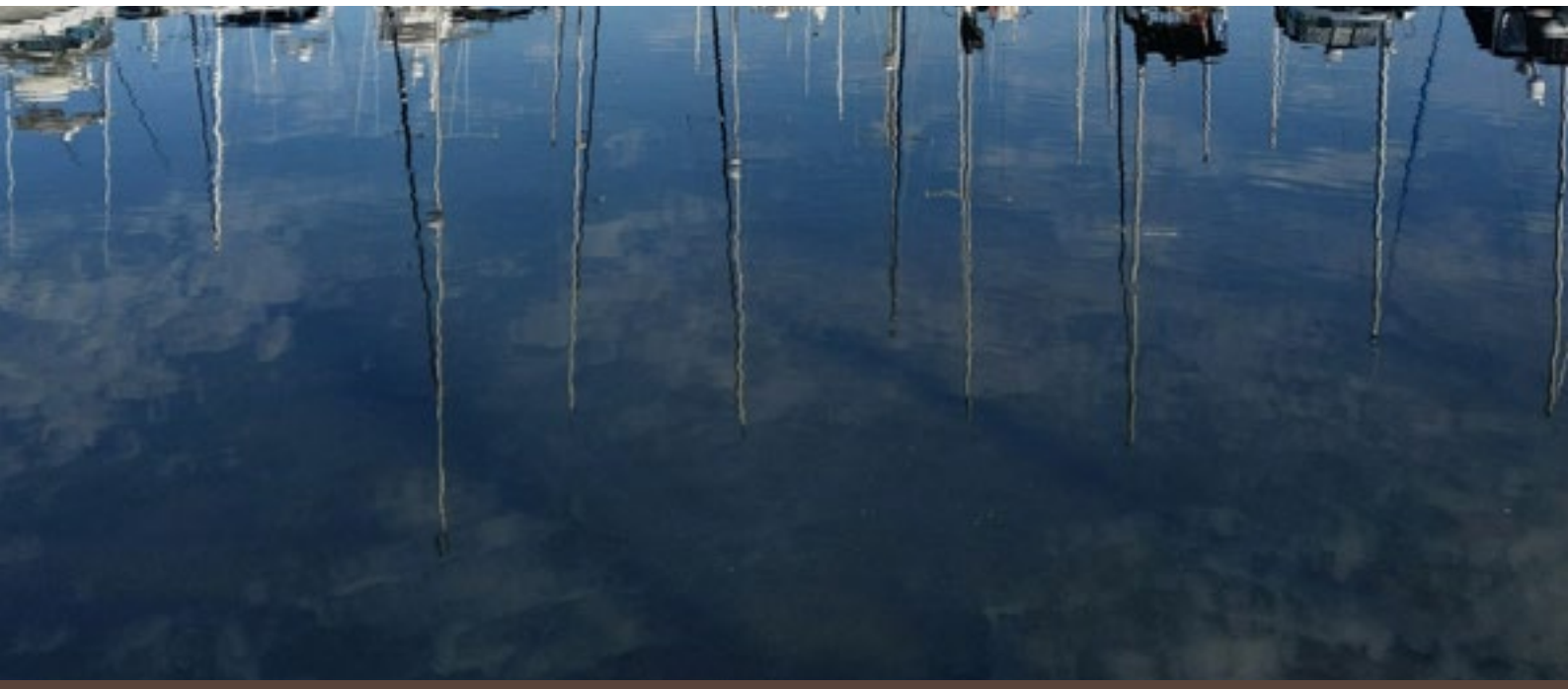
- Non-invasive or superficial inspection of the main engine and transmission and all other machinery including the stern gear including the weardown, shafts, propeller, and stern bush,
- Fuel tanks and fuel system,
- Electrical system including batteries, fuses or circuit breakers, master switches, wiring, navigation lights, internal lighting, sockets *etc.*,
- Nautical equipment,
- Gas system including gas and smoke detectors, a soundness test, lock off test and smoke test,
- Fresh water system,
- Sewage system,
- Firefighting equipment,
- Life-saving apparatus and safety equipment including bilge pump(s) and first aid kit.

The marine surveyor is responsible to not only name and describe all items examined but also to list accurately all recommendations where those items require renewal, renovation, or repair. The recommendations - and any suggestions - should distinguish between the levels of urgency and state the times within which they should be carried out. That time should, for example, distinguish between recommendations which must be done before the vessel is refloated, those to be done within a stated period, and those which may be safely left to the purchaser's convenience. Checking afterwards that such recommendations have been completed should require a return visit (for an extra fee) by the marine surveyor to the boat.

The reader should make himself/herself familiar with the British definition of accessibility.

> In accordance with ISO 10088 (E):
>
> *Accessible* means - capable of being reached for inspection, removal, or maintenance without removal of permanent craft structure.
>
> Hatch covers are not regarded as permanent craft structure in that sense even if tools such as spanners, wrenches or screwdrivers are needed to open them. Hatches for the inspection or maintenance of fuel tanks may be covered by uncut carpet, provided that all tank fittings can be inspected or maintained through other openings. Carpets should be lifted where practical to ascertain whether or no there are any hatches under.
>
> *Readily Accessible* or *Normally Portable* means - capable of being reached for operation, inspection or maintenance without removal of any craft structure or use of any tools or removal of any item of portable equipment stowed in places intended for the storage of portable equipment such as lockers, drawers or shelves.

He/she should also advise the purchaser to arrange for a lightweight check and to carry out a rolling test every five years. For guidance: It can be shown that, if the rolling period from fully out port to fully out starboard and *back again* in seconds is numerically greater than the waterline breadth of the vessel in metres, then her metacentric height (the measure of the boat's stability) is doubtful and her stability suspect. The cost of such checks is negligible. The lightweight check keeps an eye on weight creep.



The next thing for the owner to consider is the interpretation of the marine surveyor's report.

The most important items in the report are the UTS readings and it is essential to realise the limitations of the machine's use. The UTS readings are an addendum to a hammer test of the steelwork *NOT* the other way round. The *timbre* of the note emitted when the steel is struck by a hammer will tell the properly trained marine surveyor far more about the condition of the steel than any number of UTS readings. The hammer test on the steel hull is essential. A UTS reading only gives the spot thickness of the steel at the point measured and nothing else. It does *not* give the mean or average thickness of the plate under test nor, unless the plate is locally ground clean of coatings, does it give the marine surveyor any idea of the surface condition of the steel either inside or outside. A hammer test will also often find holes in the steel plating that cannot be found by a UTS test. UTS machines are virtually useless on heavily pitted areas of shell plate. The marine surveyor should use the Classification Society's standard for allowable steel losses or minimum thicknesses. Where it is accessible, the bottom or base plate should also be hammer tested. For totally unscientific and incorrect reasons, that plate is often neither painted nor fitted with anodes and is, therefore, subject to very heavy galvanic, electrolytic or microbially induced (MIC) corrosion.

Despite many scare stories about mill scale, electrolysis, nearby moored boats, and hot marina in the yachting press, by far the most important reason for shell plate pitting is galvanic action often combined with a poorly designed, inadequate, cathodic protection scheme. An anode fitted fore and aft on the swims each side of the hull does not protect either the side shell or the bottom plate from such action. Anodes fitted in shell boxes along the side of the boat are neither use nor ornament. When defects are found in the shell, it is common practice to overplate the defective area. Although it is poor practice, there is nothing basically wrong with that as long as the person instructing such a course of action has taken adequate account of the law of unintended consequences and allowed for such things as the increase in weight, the loss of freeboard, increase in draught, negative change in stability, effect on the RCD, and so on. That is rarely the case in the author's experience.

The marine surveyor should understand all those points and explain them to his/her client verbally or, better, in writing before the issue of his/her report.

Another point which often leads to error is the language used. A boat is not a house and the names for items in a building ashore do not transfer to similar items on a boat, in fact, they often have a totally opposite meaning to that assumed. Both marine surveyor and purchaser should understand that point and, to avoid misunderstanding, use the correct terminology when referring to parts of the boat's structure. The figures below gives the correct names for the midship section of a typical modern narrowboat.

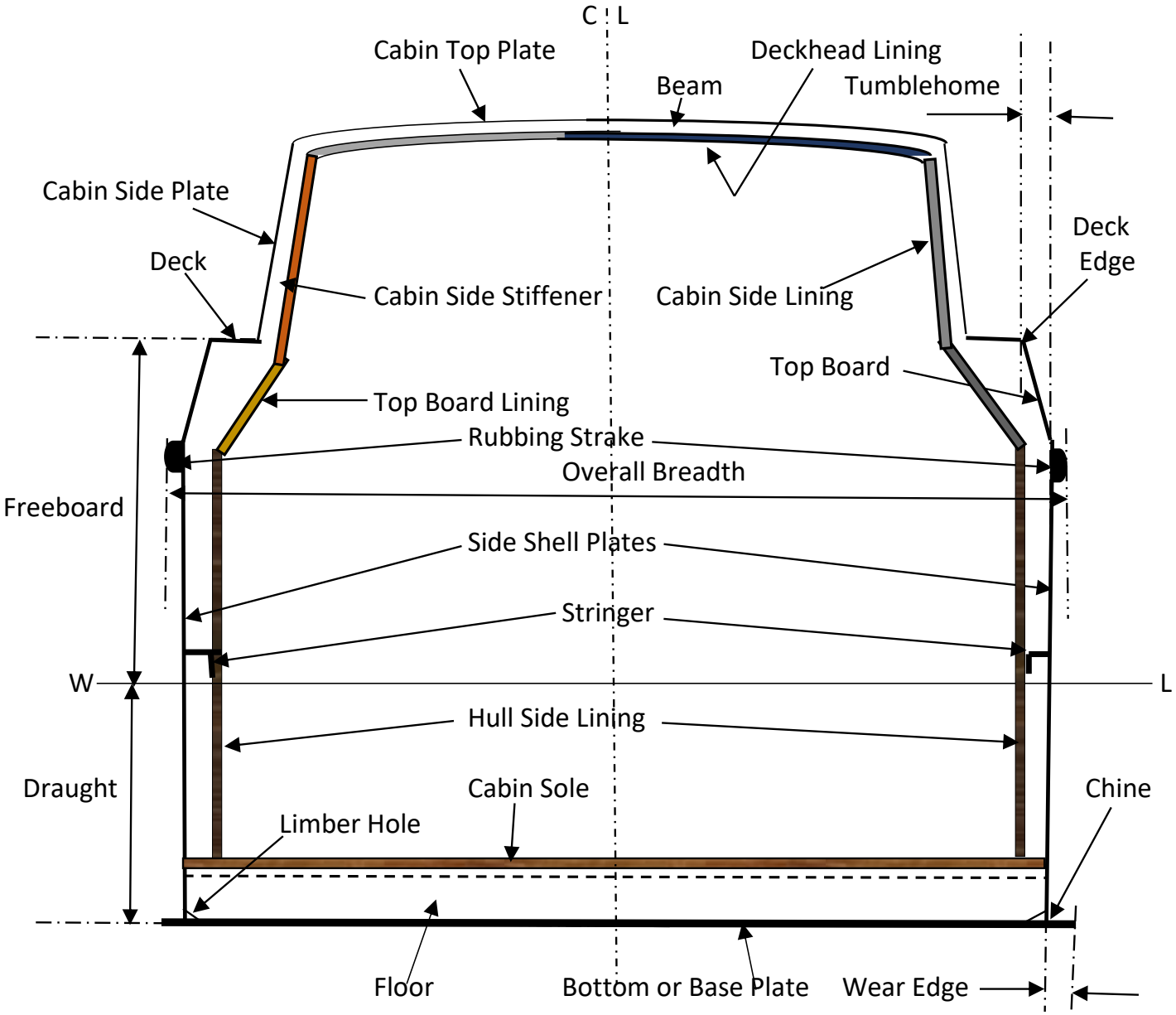


Figure 1 - Structural Midship - Section of a Modern Narrowboat

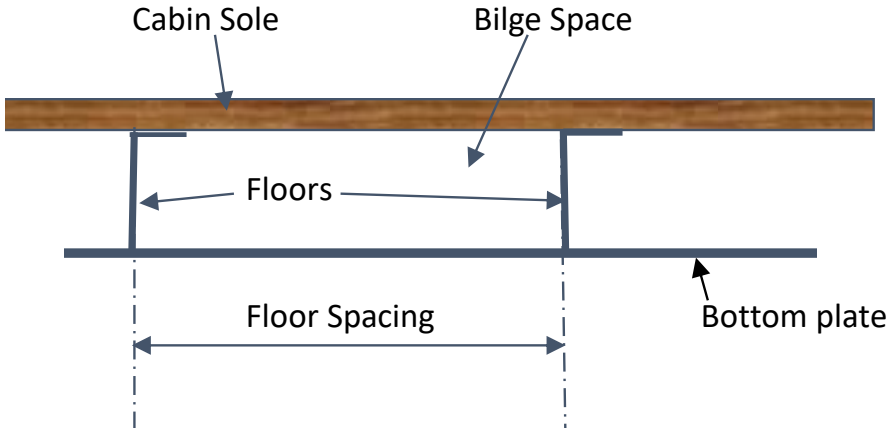


Figure 2 - Bottom Structure

Narrowboats are usually described structurally by the thicknesses of the plating and, for example, for that in the Figure as 10/6/3 where 10 is the thickness of the bottom plate, 6 the thickness of the side shell plate, and 3 the thickness of the cabin side and top plates. Thicknesses are always in millimetres.

The depth of the hull is from the underside of the bottom plate to the top of the deck plate and should be *measured* and reported.

A boat is sometimes said to be wall sided. That is not because the sides are called walls. They are not! It is because the side shell plate, like the wall in a house, is flat and upright. If the tops of the side plates lean outwards, the boat is said to be flare sided and, if the hull sides lean inwards at the top, they are said to be tumbled home.

The corner where the deck meets the side shell plate is sometimes called the gunnel. That is incorrect. The word gunnel is a corruption of gunwale. [Note, not gunwHale. A whale is a rather large cetacean. A wale was an extra thick piece of a wooden warship's side planking, and the gunwale was such an extra thick piece of planking fitted under the ship's gun ports and it was fitted there to take the weight of the gun barrels when the warship ran out her guns and 'showed her teeth'. Narrow boats, these days, are rarely built of wood and are not usually fitted with cannons.] The correct name for that corner is the deck edge or deck at side.

For reasons of economy in construction, the rubbing strake is usually fully welded along the top edge but only stitch welded along the bottom with often quite large distances between the stitches. The same usually applies to the whisker harpins round the bow and the trailer harpins round the stern. That leaves a small air gap between the inside of the rubbing strake and the outer surface of the side shell plate. If it rains, the water is drawn by the effects of surface tension round the bar and into that gap which leads initially to crevice corrosion. Over time that slowly develops into haematite and then jacking corrosion forcing the bar off the plate into clearly observable loops. The corrosion eats into the back of the bar and the face of the plate. The loops can be seen by looking along the length of the bar which should be heavily hammer tested along its length. The marine surveyor should be aware of that defect which can have serious results and report it to his/her client.

The top of the cabin is not called the roof but the cabin top plate. The upward round of the centre of that plate - usually about 30 to 40 mm - is called the camber.

The space between the lining and the inside of the plating is often filled with some form of insulation. The wooden lining upon which the owner can walk should not be called the floor, it is called the cabin sole. It should be fitted with easily portable hatch covers to give access to the bilge space under but rarely is. That difficulty and the fact that the bottom plate, the floors, and the ballast cannot be maintained without such access, should be made clear to the purchaser by the marine surveyor.

The floors are the steel angles welded to the inside of the bottom plate and the spaces between them form the vessel's bilge and usually contains the ballast. The ballast is there to control the boat's stability and trim. The corners of the floors are cut off to allow continuous welded of the side shell plate to the bottom plate. The hole that leaves is correctly called a limber hole but is often referred to as a rat hole.

The height on the centreline from the top of the cabin sole to the underside of the deckhead lining should be 1.90 m and the maximum overall breadth across the outside of the rubbing strakes or anodes, if such are fitted along the hull sides, should not exceed 2.095 m.

Photograph 1 – Bottom Leak

Photograph courtesy of Elliott Berry FIIMS FIDiagE

The vessel in the photograph had a box swim platform welded to her transom. The top plate had a cracked weld which, over time, had let in rainwater. The shell UTS readings were all acceptable and the plating looked good, but, noting a small, welded patch, the area was heavily hammer tested. The patch dislodged with the result that the water inside the swim platform leaked out. Beware!

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Why are shipping containers lost at sea and where do they end up?

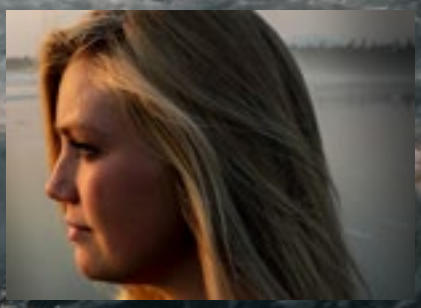
by ***Clear Seas***

There was a brisk wind blowing off Canada's Pacific coast as the small boat approached the beach on its perilous mission. Cold, salty sea-spray was blowing back, stinging the faces of the volunteers as they were trying to steady themselves along with their burlap bags and equipment, all while the boat was being tossed around in the choppy seas.

One misstep by either the skipper trying to steady the boat or the volunteers getting ready to jump into the water and clamber up the rocky beaches that dot the gnarly, rocky coastline could be catastrophic. The waters funnelled into narrow channels making it even more difficult to navigate and land, as each cycle of waves ebbed and flowed.

For Lilly Woodbury, the regional manager of the Surfrider Foundation, an organization dedicated to cleaning up the oceans, the scale of the destruction ashore was immediate. She was overwhelmed by the devastation and the sheer jumble of debris that was strewn in this once natural environment. "It was the ghastly yellow polyurethane foam and Styrofoam, which ended up washing and blowing up literally like polyurethane bombs," she said. "It was very visible, very tangible."

As she was picking up the waste her eyes caught a small creature wedged in between some foam – it was a tiny salamander and she realized just how distressing and upsetting the scene was. "It really broke my heart to see all this foam on the beach, blowing into the forest, and little creatures like salamanders sandwiched between this ghastly toxic waste," she said.



Lilly Woodbury. Tofino BC

The plastic breaks down and floats, creating the likelihood that marine animals and fish will eat it. Woodbury continued: "These little balls of yellow and white foam look like food, so it's hard to track evidence of them eating it. On the shoreline, you do find plastic foam bitten into by wolves and bears and other animals. You see bitemarks, so you know they are trying to eat it."

Woodbury and the other volunteers were now faced with a Herculean, almost impossible, task: to clean up the twisted metal and insulation from what was left of 35 empty shipping containers that had previously spilled from the Hanjin Seattle container ship and were relentlessly pounded by the unforgiving waves and tides of the Pacific Ocean.

Just a few months earlier Woodbury was at the other end of the Pacific when this barrage of wreckage fell into the ocean. It was Nov. 3, 2016. The container ship Hanjin Seattle was finishing a journey to drop off a number of full shipping containers – known as sea cans in maritime parlance – in Seattle, WA, and Vancouver, BC, and then home to South Korea. The company was in the midst of bankruptcy and financial resources were scarce.

It should have been a routine voyage, but the Pacific Ocean is well known by mariners for its strong winds, rough seas and powerful storms. Just west of the Strait of Juan de Fuca, the vessel hit heavy seas and, in a few short minutes, its empty containers were lost overboard. After reporting the incident, the ship continued its journey to Seattle to drop off some damaged containers and to have the remaining containers rearranged and secured for safe travel.

Upon hearing the news, the Canadian and US Coast Guard issued warnings to shipping that there were containers floating in the busy channel, some of which could have sunk, while others might still be floating just under the waterline.

Beyond those initial reports little was known about what happened to the containers and where their final resting place might be. That situation was soon to change. Reports started coming in that some of them were washing ashore intact while others were in fragments across 60 kilometres of the shores and archipelago that is Canada's Pacific Rim National Park Reserve.

Why do containers fall off ships?

The World Shipping Council (WSC) reported that an average 1,382 containers were lost at sea between 2018 and 2019. The worst year occurred in 2013, when the MOL Comfort sank in the Indian Ocean with a loss of 4,293 containers. Another spike happened between Nov. 2020 and April 2021, when it is estimated that nearly 3,000 containers were lost in the North Pacific in five separate incidents. That's double the annual average in a matter of weeks. So, what's going on?

There is a range of explanations of why containers fall off ships. Prior to the losses of 2020/21 the WSC issued a report that reviewed the scope of the problem. In the more recent losses, the WSC, International Chamber of Shipping and the Baltic and International Maritime Council told the International Maritime Organization's (IMO) Maritime Safety Committee (MSC 103) that it believed no single factor caused the incidents but rather that there might have been several causes. This included stormy weather, ship design, propulsion issues and how containers are lashed together including varying regulations around the latter. The degradation of containers and resulting metal fatigue could also be considerations.

In some instances, containers may not be loaded correctly and inadequately secured for rough seas. Container ships are also getting larger and stacked to the equivalent height of a medium-sized building. There are also more of these ships at sea as global trade expands. Climate change induced storms, especially in the North Pacific could be another culprit.

In an article in Insurance Journal, Allianz Global Corporate & Specialty notes that most of the recent incidents involving containers have occurred in the Pacific Ocean, a region with the busiest marine traffic and some of the heaviest weather in the world. According to their analysis, there are a number of reasons for the losses, but climate change plays a role: "The journey has always been rough, but it's become more perilous due to changing weather patterns. The rise in traffic from China to the U.S. this past winter coincided with the strongest winds over the Northern Pacific since 1948, increasing the likelihood of rougher seas and bigger waves, said Todd Crawford, chief meteorologist at The Weather Company."

But as these ships and their loads become larger and higher, their very stability is at risk. A phenomenon called parametric rolling can happen when waves hit the front of the ship at an angle, rather than head-on. As a result, the ship could go into a rolling motion synchronized with the waves which, combined with the ship's normal pitching as it moves forward, can cause containers to break free from their lashings and tossed overboard. Maritime officials say ship operators are looking at installing sensors that could issue warnings on sea conditions to avoid it.

MV Hanjin Seattle

Image Credit: Michael Schindler
http://www.nautik4ever.com/

World trade drives growth in container shipping

"The higher you stack the boxes on deck, the larger the forces they are subjected to when the vessel moves in waves, and this could be a contributing factor, especially as the recent demand boom has meant filling all ships to the brim," Lars Jensen, chief executive of Denmark-based Sea Intelligence Consulting, explained to the Wall Street Journal.

Anna Larsson, Communications Director for the World Shipping Council, says that every container overboard incident is thoroughly investigated to find and learn from the causes behind it. The final reports of the incidents at the end of 2020/21 are still pending, but it is clear that extreme weather and winds are a common denominator in these incidents.

Pinning this series of incidents on a specific cause is difficult, Larsson says: "The International Panel on Climate Change now make a clear connection between climate change and recent extreme weather events. However, which factor to attribute to climate change when it comes to these specific events, we do not know."

Opinions on the severity of the problem vary. In the view of Lars Jensen, he does not believe that there is a major increase in container losses at sea. The World Shipping Council found a tiny fraction, about .0006%, of the total containers shipped on the world's oceans each year were lost. "However, the number of containers lost increased sharply in 2020/21 driven by a couple of major events. But, statistically speaking, I find it hard to see that as a pattern, it could equally well be a fluke," Jensen said in an emailed response to a question from Clear Seas.

With that jump in losses in 2020/21, the Baltic and International Maritime Council and World Shipping Council are working in conjunction with the IMO and taking a number of actions such as mandatory container inspections and a code of practice for loss reduction. In May 2021, the IMO's Marine Safety Committee agreed to establish a compulsory system to declare the loss of containers and set up means to easily identify the exact number of losses which will help in tracking and recovery.

Still, this will not come into effect for at least 2023. In Canada, there are no specific programs to fund container wreckage removal under the Oceans Protections Plan or provincial programs. And as the case of the Hanjin Seattle illustrated, the chain of command for recovery and who would pay is not clear.

Attention was again focused on container shipping safety on Canada's West Coast when more than a hundred containers fell overboard from the M/V Zim Kingston during rough seas in October 2021 at the entrance of the Strait of Juan de Fuca.

Image Credit: Canadian Coast Guard
https://twitter.com/CoastGuardCAN

MV ZIM Kingston

Some of the shipping containers were carrying hazardous materials and ignited, causing a ship-board fire that lasted for several days. Many of the containers sank; most remain unaccounted for. Four containers were known to wash ashore along the coast of northern Vancouver Island. Debris included Styrofoam, refrigerators, consumer products and packaging materials. Clean-up crews were contracted and dispatched by the company that manages the ship. The Canadian Coast Guard actively monitored the situation and provided regular updates on the status of the ship and the lost containers.

Who's responsible for retrieving containers?

Despite the recent incident involving the Zim Kingston, container loss isn't a common occurrence in Canada. But, when it does happen, it is the shipping company's responsibility and not the Canadian Coast Guard's to recover lost containers. In the case of the Hanjin Seattle, the federal government could have forced Hanjin to remove the debris right away but didn't because it was not believed that by that time pieces of the containers posed any immediate environmental or navigational hazards.

Still, there are no international conventions specifically covering the loss of shipping containers. If contents contain dangerous materials their loss must be reported. But if there is nothing harmful in the container, there is no obligation to report its loss. In a recent interview with Ship Technology, Antidia Citores, international spokesperson for Surfrider Foundation, a Non-Governmental Organization dedicated to ocean and coastal protection, which has studied the issue, noted that: "We've found that on some occasions, the team on the boat said they only realized containers had been lost at sea once they had reached the port and had to make the inventory."

There are international treaties and regulations which, in the words of the IMO "may be relevant in the cases of claims related to containers." The

Nairobi International Convention of the Removal of Wrecks has provisions that cover "hazards created by any object lost at sea from a ship," which makes shipowners liable for damages and provides for direct action and claims against insurers. But until clearer policies and regulations are in place, as the Hanjin Seattle incident illustrates, it often becomes the responsibility of volunteers and non-governmental organizations in coastal and First Nations communities to do the heavy lifting of cleaning up the mess.

Recovering lost containers: Anatomy of a clean-up

Back on Canada's West Coast, although the Hanjin Seattle's empty containers were largely forgotten and written off as losses by the end of 2016, for the residents of western Vancouver Island they were becoming a very real, and a much bigger problem.

Cleaning up this wreckage was now of paramount concern and the responsibility of hundreds of volunteers, led by Surfrider, as well as members of the Ahousaht First Nation, and Parks Canada staff, in whose jurisdiction most of the broken pieces were resting. Many other locals acted independently collecting waste as they found it.

By April 2017, the clean-up crews started working in full force at 17 different sites around the Park Reserve, which had been heavily hit by these containers. "So, we made a remote shoreline clean-up plan where they would go in doing the heavy-duty work of cutting up the containers, doing the helicopter work, doing that really industrialized expertise work with contractors," Woodbury explains.

"We got to the most seriously hit sites, but foam is so insidious. It breaks down into these tiny one millimetre balls and there's millions of pieces. You can't pick it up, it's too hard. The sheer volume that's mixed in the soil and the sand is way too much. You do your best to pick up the big pieces before it breaks down," says Woodbury. "It almost becomes a lost cause requiring some heavy industrial systems to take out the sand and filter it to get out. We collected large pieces but there are still remnants out there."

As time ticked by later, the problem got worse. "The containers were further encased in the sand and rock along the beaches. The foam had already broken up into smaller pieces. It's very distinct foam. We're still finding foam along the coast; we still find it in 2021."

In addition to removing Hanjin Seattle's container wreckage, it was an opportunity to clean up tons of other marine debris. "It really exposed the scale of how much other plastic pollution there was. We were collecting from the Hanjin Seattle but also collecting tons of consumer plastic and fishing and aquaculture debris. So, we were getting data not just on the container ship, but also the composition of consumer and industrial plastic which elucidate the policies need to address the real issue."

As time went by, the volume of wreckage and plastic continued to climb. They filled one ton super sacks which measure five foot by 35 inches by 50 inches. "They are the size of a person and we filled up hundreds of them," she said. That was over and above the containers themselves that needed to be cut up by professional salvage crews and hauled out by helicopter. Woodbury and her volunteers collected between 20 to 30 tons in total. "And keeping in mind most of that was foam and plastic which on its own doesn't weigh a lot."

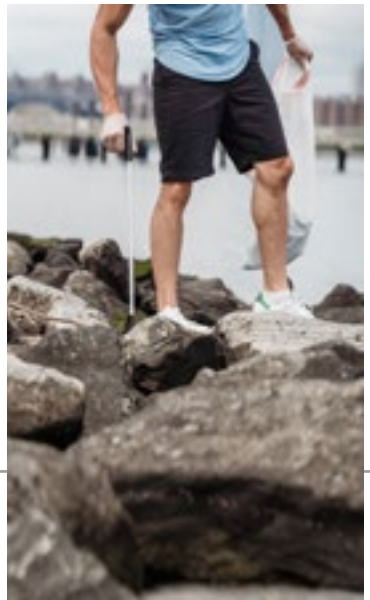
Working with First Nations for clean-up

The clean-up crews worked closely with First Nations as the wreckage and pollution was largely on Indigenous lands and waters. "All of our clean-ups are in partnership with First Nations. Before we start, the very first thing we do is work with the Nation, get approvals, and see how we can work together. We contract with people from the Nation, so it provides employment and respects their laws in their territories. Their Elders and Chiefs come and do openings and blessings. We collaborate as much as possible."

Woodbury says that she feels that the shipping industry is disconnected from the repercussions of lost containers and doesn't see the end result. "If they'd been here on the ground they would have seen how disastrous it was for the coastline and how much that hurt the people who live here. Honestly, it's a form of 'waste' colonialism for the Indigenous People, the First Nation. Were they compensated for the disaster that happened on their land? No. But that waste material was just shipped off on to their territory without a thought."

What the future holds?

The loss of shipping containers at sea is a concern for the marine shipping industry. While the numbers that fall into the ocean and wash ashore are still relatively small, it is clear that in the case of Canada's West Coast the impact of lost shipping containers – even empty ones – can be devastating to local coastal communities as well as marine and land animals. Although the Hanjin Seattle lost empty containers, the MSC Zoe, which lost 342 containers full of household products on New Year's Day 2019 off the coast of the Netherlands illustrates the environmental issues associated with the waste from full containers. Another serious incident occurred when 54 tons of nurdles, the pre-production elements of plastic, were lost off the coast of South Africa in 2017.



New regulations, stronger enforcement and improved safety should prevent many of these incidents from happening. But even then, the legacy of a few broken shipping containers can be destructive and costly, and the salvage bogged down by confusion within different jurisdictions as to who's actually responsible for cleaning it up.

Containers 101: A short history of the sea can

There are roughly 226 million container boxes shipped annually with some 6,000 container ships at sea at any point in time as part of the global supply chain. They ship approximately US$4 trillion of commercial goods annually and have completely revolutionized global trade. The concept of the container was conceived of by Malcom McLean, a former North Carolina truck driver in 1937 while he waited most of the day to deliver cotton bales on his truck to a pier in New Jersey. "Suddenly it occurred to me: Would it not be great if my trailer could simply be lifted up and placed on the ship without its contents being touched?"

He put his idea into action as he converted the World War II tanker Potrero Hills to a ship capable of carrying containers and rechristened her the Ideal X. She made her maiden journey on April 26, 1956, sailing from Newark, NJ, to Houston, TX, carrying 58 metal containers and 15,000 tons of petroleum. McLean moved into ship owning with his company Sea-Land. Initially the containers were loaded on their chassis, but later the chassis was left behind, enabling containers to be stacked. The first vessel to carry containers only was Sea-Land's Gateway City which made her maiden voyage on Oct. 4, 1957.

Shipping containers are mostly made from steel and come in two principal sizes (20 or 40 foot lengths conforming to twenty foot equivalent units or TEUs) for ease of fitting on ships, trains and trucks for intermodal transportation. There are 11 types of containers and dimensions can vary slightly. While some are a basic box, others called reefers can be insulated and contain refrigeration units for the shipment of frozen foods, vegetables, pharmaceutical and medical products, and other perishable items. Others can be adapted to fit tanks for the shipment of liquids. Sea cans carry building supplies, fertilizers, smart phones, furniture, appliances, pots and pans, just about anything you use in your daily life. They can also contain hazardous materials, chemicals, and a range of what could be toxic products if spilled or leaked into the ocean. Containers aren't necessarily watertight, but may float in the event they go overboard. Few are recovered: most sink or wash ashore.

Nearly seven decades later, the reality is that container ships have become a vital link in global trade and are being built to carry more containers than ever. The Ever Ace, which is the world's largest container ship, has a 23,992 TEU capacity, and is one of the most technologically advanced ships in the world. And it's that increase in size that could be leading to more mishaps.

About the authors Clear Seas

Clear Seas Centre for Responsible Marine Shipping is an independent not-for-profit research centre that supports safe and sustainable marine shipping in Canada.

Clear Seas was established in 2014 after extensive discussions among government, industry, environmental organizations, Indigenous Peoples and coastal communities revealed a need for impartial information about the Canadian marine shipping industry.

Clear Seas provides impartial information on marine shipping in Canada to policy makers and the public. Our mandate is to initiate and interpret research, analyze policies, identify best practices, share information and facilitate dialogue.

Our research focuses on the human, environmental and economic impacts of marine shipping. That includes practices for safe handling of bulk commodities at marine terminals, impacts of oil and liquid natural gas shipping, spill prevention and response, impacts on coastal and Indigenous communities, and much more.

Find Clear Seas on the internet at **https://clearseas.org/en/**

COAST GUARD DRONES CAN SEE UNDERWATER AND INSIDE VESSELS

DURING RESPONSE TO HURRICANES AND EXTREME WEATHER EVENTS

By Kathy Murray, MyCG Writer

Shortly after Hurricane Ida tore through Louisiana at the end of August 2021, the US Coast Guard's Gulf Strike Team in Mobile, Ala., got a call. Trouble spots had been identified, including sunken vessels, potential pollution, and other waterway hazards. Could the team deploy a pilot to assess the damage?

Petty Officer 2nd Class Dylan Zechman responded, bringing along one of the Coast Guard's short-range unmanned aircraft systems (SR-UAS) – essentially a handheld drone. Using satellite imagery gathered by the National Oceanic and Atmospheric Administration (NOAA), he launched the small portable aircraft over target areas deemed potentially hazardous, capturing photos and data that would be sent back to incident command to help prioritize recovery efforts.

"It's a great tool," said Zechman, who estimates that he and a pilot from the Atlantic Strike Team each averaged three or four flights a day during the three-week mission. "We were even able to spot a broken off boom from a crane barge underwater, where there was hull damage to the barge and the diesel tanks on board were leaking into the water."

Zechman's deployment is just one way the Coast Guard is increasing its use of drones after hurricanes and severe weather events. In addition to using UAS for routine inspections, the service's civil engineering units have also brought in drones to identify storm damage in and around Coast Guard and strategic coastal facilities. While airplane surveillance and helicopter rescues may be more visible, a growing fleet of unmanned aircraft is frequently taking the lead in post-storm damage assessment and cleanup. And they're not only doing it more safely, but usually at a fraction of the cost. The battery-powered drone Zechman pilots, for example, costs about $1,800 to buy compared to the $7,000 or more per hour it takes to operate a helicopter says Chief Petty Officer Toni Warnock, the Coast Guard's Short Range UAS subject matter expert and fleet training manager. "We've utilized SR-UAS following every major tropical event since 2018," he added. "The return on investment has been phenomenal."

The Coast Guard has a variety of drones at its disposal, both cutter-based and on land.

At the top end, the Coast Guard uses the General Atomics MQ-9 Predator in partnership with U.S. Customs and Border Protection to conduct surveillance for drug interdiction, migrant traffic, and other nefarious activities along the southern borders. These long- range drones, which are land-based, weigh in at 10,500 pounds and can travel at speeds of up to 276 mph.

In addition, National Security Cutters have medium range UAS capability with the Insitu Scan Eagle and their launching systems on board. These fuel-powered drones have a wingspan of more than eight feet and can remain aloft for 10 hours, traveling at speeds up to 96 miles per hour. Some of them have supported hurricane relief efforts and made damage assessments in the past, including during Hurricane Dorian but they're primarily used for surveillance at sea, particularly for drug interdictions. No cutter-based drones were deployed for Ida.

The short-range UAS, on the other hand, are quite small and portable. A service member who has been certified as a remote pilot can easily carry, launch, and retrieve one of these multi-rotor aircraft from almost any location. Once in flight, these battery-powered drones by regulation must be kept in sight by the pilot and visual observer. But they are capable of flying one and a half to three miles from the pilot and up to 400 feet in altitude for a duration of approximately 20 minutes. Coast Guard UAS teams are equipped with multiple battery packs per system, so these drones can land, swap batteries, and be back airborne in just minutes vs. waiting 45 minutes for the battery to recharge.

The Coast Guard first began using these short-range drones in mid 2018 as part of the Group 1 UAS Prototype Program Initiative (GUPPI). The initial program included seven Coast Guard units and 14 short range systems. Today it has 32 units strategically located around the U.S., with more than 70 systems and 150 certified UAS pilots. Pilots are required to have an FAA Part 107 license (the Coast Guard covers the testing) and complete a three-day ground and flight training course with one of the instructors. But all units and rates will be considered, according to Lt. Cmdr. Dominic Bucciarelli, program manager for the short range UAS. "We have non-rates to senior officers flying these systems," he said.

In just three years, the short-range drones the Coast Guard uses have demonstrated several operational advantages over traditional methods of surveillance or damage assessment following a hurricane.

Improving Safety for our Operators

Drones can be used to inspect a variety of sites and do it safer. They often eliminate the need to send manned Coast Guard aircraft and crews up in precarious weather for missions outside of search and rescue. After Hurricane Ida, the Coast Guard's Civil Engineering Unit used drones to assess damage in and around service facilities. Due to image quality and the accuracy of GPS, software can be used to extract exact measurements from the imagery to determine material needed for repairs. Before, the only way to do this was to have service members or contractors physically climb onto roofs and towers to measure the structures manually.

Image credit: Chief Petty Officer Cameron Steinmetz and Petty Officer 3rd Class Tim Loveday

Improving Response Operations

A short- range drone packs a lot of capability into a small space. This includes a high-quality camera that collects still and video images "far superior to other sources, including manned aircraft and satellite," according to the GUPPI report. This has made them invaluable for assessing damage to exact measurements and helping locate pollution or chemical spills. "They can literally capture images not visible to the naked eye," said Warnock, noting that UAS infrared cameras can detect heat signatures. During Hurricane Dorian, for example, Coast Guard drones were able to identify areas of pollution that were not visible from the ground and most likely would have been missed had drones not been used.

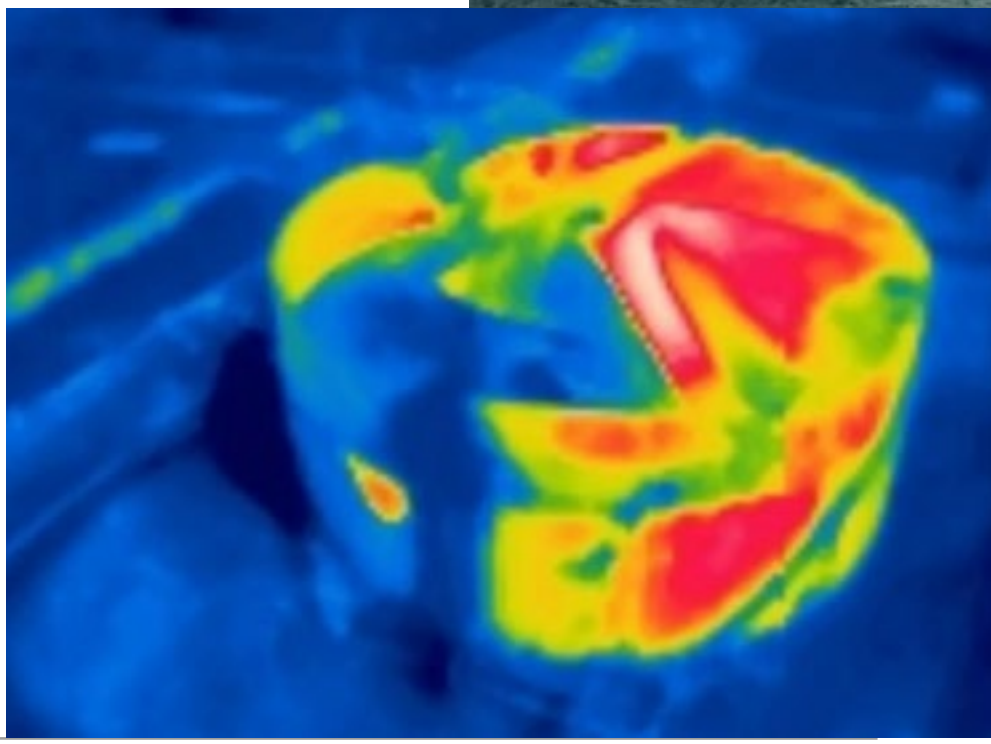


Image credit: Petty Officer 3rd Class Vincent Moreno

Boost Efficiency

Aids to navigation (ATON) are the buoys and channel markers the shipping industry relies on to navigate in and out of ports. They often get dislodged during a storm surge, and cause delays or hazards in the global supply chain. Previously, the only way to address the issue was for Coast Guard ships known as "buoy tenders" to go from buoy to buoy to verify each was in its proper position relative to the channel. Now a pilot can quickly launch a short-range drone from an underway vessel and record the position of several buoys in one sortie. This enables the vessel to continue its patrol of the shipping channel, only stopping if the drone finds a buoy off station or damaged.

Despite the advantages UAS offer, they will never be able to replace manned assets completely. Drones can't implement on scene decisions such as hoisting during a rescue mission, and even large logistics haulers will be hard to replace because of the nature of their missions. But using a UAS to bridge the gap is incredibly helpful – especially in search and rescue, Bucciarelli added.

"The search part is what wears down crews," he said. "If (drones) can take that out of the equation and make it into a 'point to point' mission, we've increased our manned crews' safety exponentially."

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DIGITALIZATION

Keeping Your Hull Stress and Fatigue under control

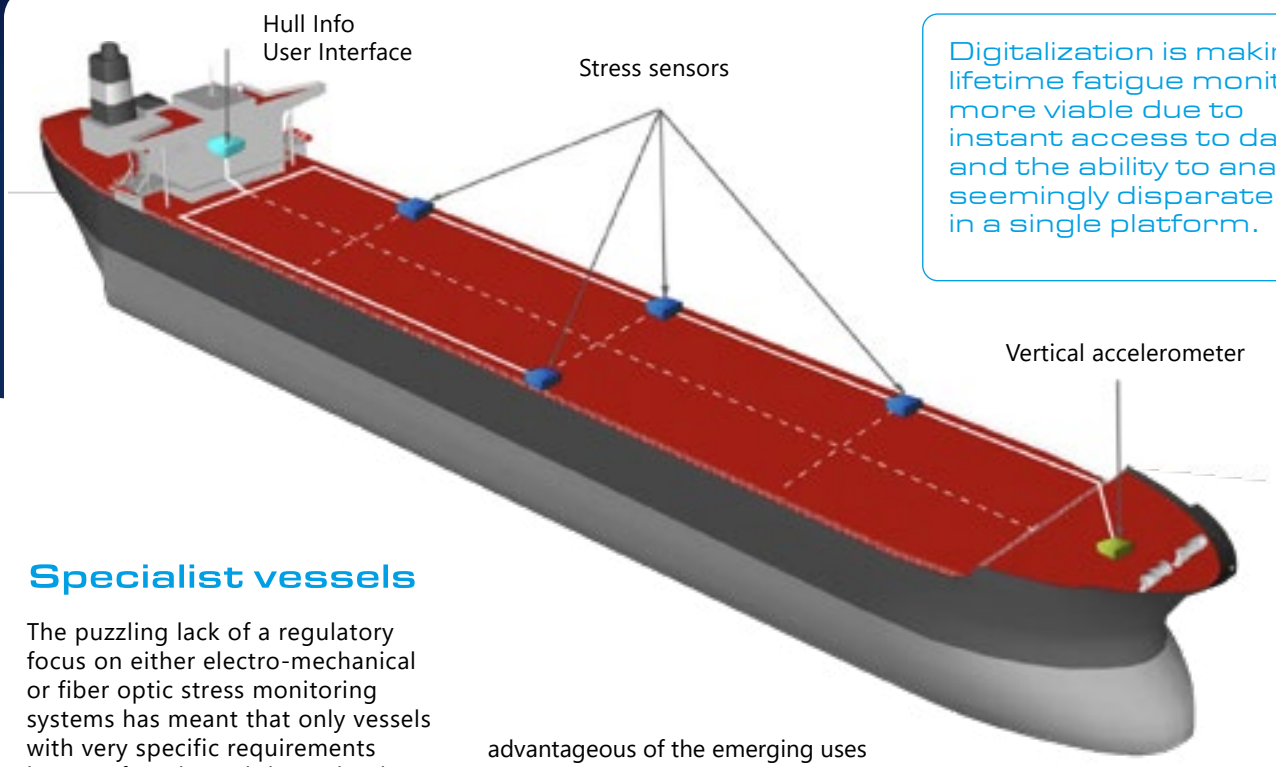
LIGHT STRUCTURES
Passion for Monitoring

By Terje Sannerud, Chief Commercial Officer at Norwegian fiber optic condition monitoring system developer Light Structures.

Digitalization is expediting and maximizing the safety and economics of structural stress and fatigue measurement technologies. Yet to be mandated by the IMO or included in any SOLAS regulations, structural stress and fatigue monitoring systems have in fact been used for providing real-time safety warnings on large and specialist vessels for more than two decades. They are used to measure the impact of dynamic forces on a ship's hull and structure to provide data that captains, and navigators can act on to ensure safe operations in practically any conditions.

There are two competing approaches to hull stress monitoring, setting ship managers and owners up with a choice between electro-mechanical systems or fiber optic technology. The latter is the basis for the SENSFIB Hull measuring system developed by Light Structures, which uses an accurate, high-level multi point monitoring technique called Fiber Bragg Grating (FBG) to deliver more precise data covering diverse local loads and global loads such as deflection, slamming, whipping and springing.

Light Structures was responsible for commercializing FBG-based hull stress sensors as a spin-off from a Norwegian Defense Association project around the turn of the century. The ambition was to provide commercial customers with access to stress and fatigue measurement data that was not only more resilient and granular than that provided by electro-mechanical systems but was also more cost-effective due to being easier to install and having no requirements for annual recalibration.



Digitalization is making lifetime fatigue monitoring more viable due to instant access to data and the ability to analyze seemingly disparate data in a single platform.

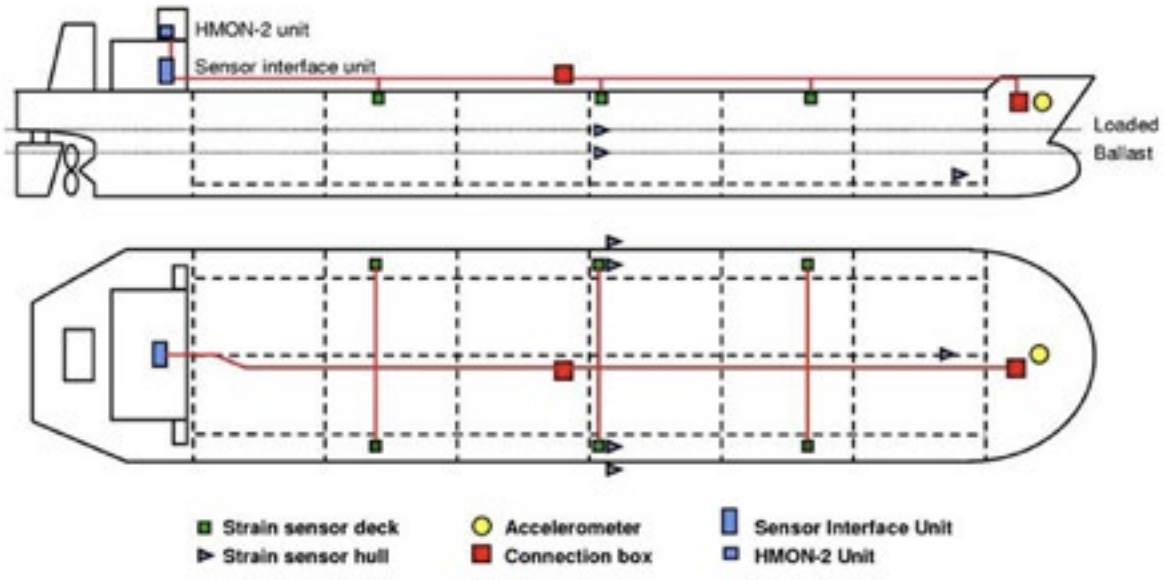
Specialist vessels

The puzzling lack of a regulatory focus on either electro-mechanical or fiber optic stress monitoring systems has meant that only vessels with very specific requirements have so far adopted the technology. Still, despite the lack of pressure from authorities, there are now more than 300 customized SENSFIB installations currently active on the largest commercial ships, oil and gas platforms, FPSOs and naval or coast guard vessels.

The hull stress data acquired via SENSFIB has undoubtedly contributed to reducing maritime casualty statistics, but as the technology and its use as an early warning system on board matures, new avenues for unlocking insight from the data are opening up, especially as maritime digitalization takes hold. Improved fatigue measurements, calculated as a result of monitored deflection and vibrations is perhaps the most advantageous of the emerging uses for structural stress data, especially when applied to verify the design numbers of expensive, one-of-a-kind vessels or to improve asset management across a large fleet of identical, or similar ships.

Comparison of actual fatigue life with design fatigue life is a standard function in SENSFIB systems. Results are normally presented based on the latest half hour of data (single point in time) with a bar graph, and the time history of the comparison implemented as an onshore function. A graphical representation of the timeline can be implemented onboard as a custom function in the SENSFIB operator station and in case there is a significant difference between the actual fatigue life and the design life, the system can provide the user with advice on the cause of this difference.

The standard function is to present the overall fatigue life calculation together with the contribution due to wave loading (included in design life) and contributions due to vibrations (not included in design life). With access to a full set of design parameters and environmental data, including wave data, it is possible to extend the advisory function to include a comparison of the actual loading conditions with the loading conditions used for design life calculations, as well as a comparison of the actual wave scatter with the design wave scatter.



Unlocking Data

To date, fatigue calculations from stress monitoring measurements have been somewhat constrained because the raw data would normally have to be hand delivered on back-up media to the shore office, and then analyzed or applied in what is essentially, an operational silo. Lower cost satellite connectivity and the deeper integration possibilities of digitalization and the Internet of Things are bringing new life to stress and fatigue monitoring data though, and nowhere is this more important than efforts to maximize operational lifetimes of multi-million-dollar maritime assets.

With online access to SENSFIB data uploaded direct from ocean going assets, Light Structures can help to verify or refute complex vessel designs on an on-going basis. Over time, this will contribute to building even safer, more effective and less costly ships and maritime assets. Further, through digitalization of SENSFIB data, it's possible to measure fatigue across entire fleets of identical vessels in order to ascertain how certain maritime environments affect the condition of ships.

As part of a Condition Monitoring System for instance, this data could allow for preventative maintenance on stress and fatigue hotspots as well as providing a platform for improved fleet management. With the ability to measure the impact of dynamic forces in any particular region, the lifespan of vessels across an entire fleet could be improved by minimizing exposure to environments that have been measured to cause more damage to vessels. By 'swapping out' vessels, there is potential to spread the financial and asset life expectancy cost of operating areas with high fatigue rates, therefore reducing damage or downtime caused by fatigue across an entire fleet.

The optional SENSFIB Active Fatigue Management (AFM) system is a service that adds advanced fatigue analysis functionality to the core system, including; a rainflow counting algorithm and miner's sum calculations for calculating actual fatigue damage at sensor locations; hotspot monitoring by sensors in coldspots, by scaling measurements with Stress Concentration Factors (SCFs preferably provided by yard based on structural analyses); virtual sensors, i.e. each actual sensor is scaled with different SCFs for several nearby hotspots; life-time usage based on comparison over time between the actual fatigue life consumption and the nominal consumption for design life; separate calculations of fatigue damage due to wave-driven stresses and fatigue damage due to vibration phenomena and; low-cycle fatigue calculations to include the contribution from loading and offloading cycles.

Long-term Fatigue

Light Structures has already developed methodologies and workflows to apply SENSFIB data for long-term fatigue measurement. The US Coast Guard's Service Life Extension Program (SLEP) is an ideal example, where fatigue data has helped to signpost specific maintenance requirements. With data collected manually however, the complexity has made it the preserve of the particular dedicated owner or operator. It's no surprise that an organization that is duty bound to maximize the lifespan of its assets will carry out such an undertaking then. For the rest, digitalization is making lifetime fatigue monitoring more viable due to instant access to data and the ability to analyze seemingly disparate data in a single platform, which ultimately, can provide more connected insight and even more value.

Light Structures is leveraging more connectivity with the SENSFIB Integrated Marine Monitoring System (IMMS), which combines comprehensive stress monitoring with environment monitoring parameters and advanced processing for real-time analysis of live data and theoretical models. Third party data from environmental monitoring systems, loading computers, DGPS and mooring tension measurements can be combined with data from the FBG sensors for stress and strain monitoring, as well as the motion sensors and wave spectrum analysis that make up a standard SESNSFIB installation.

This is also just the start. Light Structures' stress and fatigue data will be used as an essential component in Digital Twins and CBM systems, and through this, the combinations of data types are practically endless. And so too is the insight that can be gained. Regulations or not, the savings enabled by extending the useable lifespan of a vessel or an entire fleet are an attractive proposition for ship owners and managers counting on digitalization to deliver operational efficiency.

Four inefficient shipping regulations that no one talks about

Article Source: Wärtsilä Oyj with contributions from Hendrik Bußhoff, Head of Product Autonomy Solutions, Wärtsilä Voyage

Stop. Take stock and ponder a moment or two. Do you know exactly how many regulations and laws govern today's shipping?

For an industry that's about 5,000 years old and moves approximately 90% of the world's goods, while navigating some of the most challenging environments on international waters, there are bound to be a bunch of rules. In fact, there are so many, it's almost impossible to give an exact number.

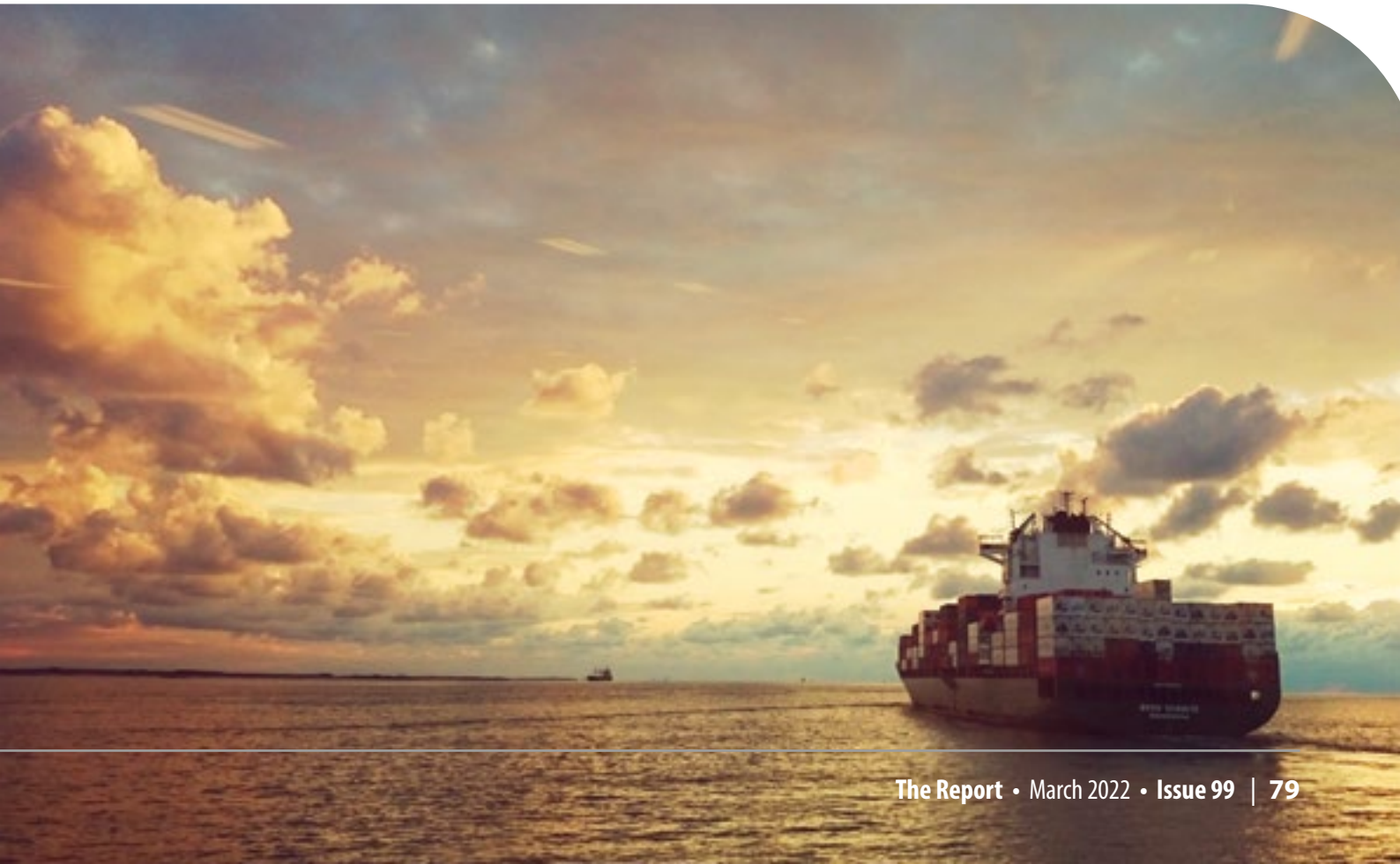
Shipping was amongst the very first industries to adopt the widely implemented international safety standards. Because of its inherent global nature, the International Maritime Organization (IMO) has developed a comprehensive global maritime safety regulations framework. But that's obviously not all. There's SOLAS, MARPOL, COLREG, LOADLINE AND ISPS, which just cover ship operations. Then there's STWC and ILO 147 for the seafarers, and ISM dealing with the shipping companies. On top of this, there are numerous local and port regulations to follow, certifications to obtain, taxation frameworks, cybersecurity guidelines, along with many other maritime instruments concerning more specific issues that are also in force worldwide.

To put it mildly, shipping's regulatory framework is complex.

But what makes this landscape sometimes unnecessarily cumbersome are obsolete rules and requirements that have lost their relevance with time. "We're using AI on ships while forcing them to have a bell on board. In between these two generations of technologies, there's a huge gap that's getting too big to manage," says Hendrik Bußhoff, Head of Product Autonomy Solutions, Wärtsilä Voyage. "With every technological advancement, we keep adding new regulations to the books without retiring or at least reviewing the old ones."

Many of these old conditions of operation are mindlessly enforced, and unnecessary solutions are engineered to incorporate them in modern automated systems merely to check a box.

Following are four such examples of obsolete regulations and redundant systems that shipping could sail without.



The Foghorn

In reduced and low visibility conditions, as per rules, a ship is supposed to sound the horn to signal its presence to other ships. In return, other ships are required to keep a lookout 'by sight and hearing'. On most ships, when you go on the bridge wing, you hear your auxiliary engines, engine room fans and possibly the noise of a few hundred reefer containers. There's hardly a chance of hearing another ship, not to mention determining its accurate bearing and range. So why do we have this requirement? That's because back in the days, you had little choice but to listen. And it did work well when you were on a sailing ship or older three-island designs where the bridge is separate from the engine. But today, it's a different scenario. You no longer have to depend on hearing other ships to be aware of their presence or sound the foghorn to make them aware of yours. We now have a rich set of technology choices to solve this archaic problem that are much better and more accurate than honking the horn or ringing the bells and gongs.

Unmanned engine rooms are a good example of similar progression. Original regulations required an engine room watchkeeper to utilise their senses of hearing, sight, smell and touch. But when we substituted human watchkeeping with 'unmanned' technological solutions, we didn't have to substitute the senses of touch and smell. "That's because, 50 years ago, someone was brave enough to say it doesn't make sense anymore, given all the technological advancements. Take the example of smell, for instance: The original purpose behind this requirement was to ensure that the whole ship doesn't go up in flames. But today we are better off with a contemporary fire detection system than trying to sniff out smoke. So, we decided to get rid of the 'smell' part of the regulation. And, thus, in engine rooms, we have advanced a little further than we have on the bridge," points out Bußhoff.

Logbooks and Noon Reports

There are many digital ways today to quickly and efficiently record data. Yet, the golden standard to date is writing things down. This makes the information neither searchable nor can it be structured or unified. Similarly, like everyone else, ships start their days at midnight and yet are still required to file noon reports. "Noon reports made sense when navigation was based on stars, and around noon the sun offered a convenient opportunity to calculate the vessel's position. We definitely no longer depend on the sun to determine the ship's position and yet continue to obsess with noon reports," says Bußhoff. "Ships are generally not even required to carry sextants anymore. So, even if you remembered how to use it, your noon position often is just out of reach nowadays."

The Magnetic Compass

Lots of time and money is spent on adjusting and operationally monitoring the deviation of the magnetic compass. However, what used to be a tool of immense value on wooden ships, now delivers questionable results on today's ship made of steel. As we know, steel corrupts the core alignment of the compass that's based on Earth's magnetic field. And it doesn't get any better when you have thousands of containers made of, well, steel again. Meaning, the compass has to be reconfigured during every port call as every loading and unloading operation disrupts your careful adjustment. And so, what is often perceived as your last navigational resort to bring you home if the lights went out, has every chance of underperforming when it is needed the most. But then again, considering today's systems, your engines most likely also went out with your lights, making having the compass futile again. But that's not all. "There is a particular failure mode on many new builds connected to the magnetic compass," tells Bußhoff. "Because there is a requirement to have the compass visible on the steering station, many ships have a periscope-like duct, pointing upwards. This open duct catches not only light but often rainwater, which finds its way down, dripping directly on instruments, damaging them and often triggering the same short-circuit against which the magnetic compass is immune to." Thus, the question here is: Does the compass still solve a real problem onboard? Or is it just another nugatory remnant from shipping's evolutionary past, only delivering a perceived sense of safety?

Numerous Certificates to sail

To give an example, we simulated an inland voyage carrying grain from Nakskov in Denmark to Salzgitter, a small port about 200 kilometres south of Hamburg, Germany. The journey starts somewhere in the Baltic Sea, and we travel down Germany's inland river system. To complete this single journey, it requires six different operator qualifications and certifications along with expert knowledge of the German language. Starting with the standard deep-sea certificates of competence to the different pilot exemptions certificates and separate river licenses along with a Class A general inland waterways license, it can take about ten years of training to get there. In short, no one person can be expected to have all these skill sets alone. So, typically a vessel would have to have multiple crew members on board to be able to navigate this small stretch or spend a handsome amount on getting special pilots' assistance at each junction.

The bigger problem with such an arrangement is that all these qualifications and pilot exemption certificates are then tied to resources onboard a specific ship, in a particular area.

Instead, if the operations were carried out by a remotely monitored vessel, there won't be a need to have six different specialists onboard anymore. Having the right competencies available in a single remote-control centre, and used only when they are needed, would both suffice and optimise the process. This way, the same bunch of experts, who are no more tied to a particular vessel, can be shuffled to manage multiple ships in a fleet as, when and where their specialised skill sets are required.

This will not only cut costs and ease operations but also help tackle any plausible crew shortages. Having niche specialisations among operators will also make training easier and faster. "Instead of spending ten years to obtain multiple licenses and certifications to operate one vessel, a person can operate multiple vessels on a particular stretch with a specialised but much shorter training," says Bußhoff.

Shipping is full of such examples where we're expected to have modern automation work around rather ancient rules, which merely exist because "things have always been done that way".

They were the smart solutions in their age and time, but technology has advanced by leaps and bounds since. And there are much more intelligent, precise and safer systems to take care of the same functions. But we have not bothered to get rid of some of these archaic rules and replace them with something more contemporary.

The sea is an unforgiving medium where safety always comes first. Bad weather, wind and waves make for a dangerous environment that challenges the ingenuity of engineers, designers, and navigators. That won't change when the balance between humans and technology shifts in favour of technology. Plus, as the push for decarbonisation becomes a dominant driver, the introduction of new technologies will bring new ways of working and demand a new mindset from everyone involved in shipping.

But before we start building ships with new technology, maybe, it's time to re-evaluate a bit, think which regulations and guidelines are still relevant and make sense, and which ones have become outdated.

The answer is not to simply keep adding new regulations, but also to analyse the old rules and their fundamentals – ask why they exist in the first place, and then implement intelligently – revise where needed, and get rid of the unnecessary.

WHAT'S THE CURRENT POSITION WITH FIRE ONBOARD SHIPS?

This article first appeared on the Safety4Sea website https://safety4sea.com and we thank their editorial team for their insight.

In 2020, there was approximately one fire on average every two weeks onboard ships, while fire/explosion remained the third most common cause of ship total losses (11%) over the past decade. These numbers, revealed in a report by Allianz, show the problem persists despite coordinated industry efforts to minimize such incidents.

Fire onboard remains among the main safety concerns for shipping, since, unlike a fire incident ashore, seafarers are not able to walk away in case of such occurrence and are thus dependent upon adequate fire prevention measures and skills to tackle the incident. The Safety and Shipping Review 2021 by Allianz revealed that the number of fires/explosions resulting in total losses of vessels increased year-on-year hitting a four-year high of ten. Vessel size has a direct correlation to the potential size of loss, while fire hazards onboard are common both in the engine room and the accommodation space.

REGULATORY OVERVIEW

On 1 July 2002, a comprehensive new set of requirements for fire protection, fire detection and fire extinction onboard ships entered into force as a new revised chapter II-2 of the SOLAS, 1974, as amended, incorporating technological advances in fire detection and extinction as well as lessons learned from fire incidents over the years.

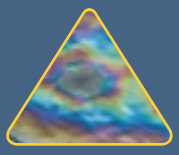
The main regulatory tool for fire detection and fire extinguishing systems is the IMO's Sub-Committee on Ship Systems and Equipment (SSE) which deals with a wide range of technical and operational matters related to systems and equipment on all types of ships, vessels, craft and mobile units covered by IMO instruments.

Recognizing several recent serious fire accidents on ferries, the latest SSE Sub-Committee (SSE 7), that took place in March 2020, focused on potential draft amendments to SOLAS Convention and associated codes, to enhance fire prevention, detection and extinction on these ship types. It also finalized draft amendments to Chapter 9 of the FSS Code:
- The revised guidelines for the design and approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces (MSC.1/Circ.1430/Rev.1) and the Guidelines for the maintenance and inspections of fixed CO2 fire-extinguishing systems (MSC.1/Circ.1318);
- It also progressed the revision of the Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk (MSC.1/Circ.1315).

LET'S ASSESS FOUR COMMON CAUSES OF FIRE ONBOARD

OIL LEAKAGE:

Leakage from high-pressure fuel oil pipes is the most common risk for fire onboard as oil from these pipes can accidentally fall in high temperature areas due to the machinery involved.



Example case: A cruise ship left Livorno, Italy, with around 2,000 people onboard, when smoke and flames erupted from an auxiliary engine. The fire was contained without casualties and the ship safely returned to Livorno. It was found that during a maintenance earlier in the day, the main fuel oil supply and return lines had been dismantled and replaced with new pipes, damaging an O-ring, which led to fuel oil leak close to the turbocharger and the aft exhaust gas manifold.

✓ Do: Insulate any hot surface with a temperature above 220 C to prevent any oil encountering a hot surface

✗ Don't: Invest in poor quality materials regarding pipes and/or associated fittings.

ELECTRICAL FAILURES:

Leaving personal electronic items unattended always entails risks, as there have been cases of faulty devices, overloading of extension cables and plugs, and so on.

Example case: A faulty mobile phone charger caused fire in a seafarer's cabin onboard an RMI-flagged ship. It was found that the charger was left plugged in while unattended and an electrical short circuit ignited paper on a desk.

✓ Do: Remove defective equipment from use/service when damage is identified.

✗ Don't: Use multi-gang extension leads and high current devices onboard.

FLAMMABLE CARGO:

It is not uncommon that fires erupt during loading and unloading of specific cargoes, like coal, as well as from misdeclared hazardous cargo in containers, such as self-igniting charcoal, chemicals and batteries

Example case: The master of a container ship saw a large cloud of smoke issuing from the forward part of the vessel. The vessel was transferred to safe anchorage and the fire was extinguished. It was found that the container where the fire started was not declared as dangerous cargo but was actually loaded with calcium hypochlorite and had been misdeclared by the shipper. The charterer had loaded the container as per the rules of the IMDG code.

✓ Do: Check that all packages are properly marked and labelled; consider using a Container Packing Checklist.

✗ Don't: Pack damaged packages or stow heavy goods on top of light goods.

HOT WORK:

Many cargoes, including a wide range of bulk cargoes and general cargoes, can be ignited by hot work.

Example case: A fire broke out on a container ship during welding as part of repairs to the cell guides in a cargo hold. The fire was extinguished with no injuries but the container that had caught fire was an open top container covered by a tarpaulin and containing cloths, tyres, wooden plates and machinery.

✓ Do: Carefully prepare and isolate the work area before work commences.

✗ Don't: Neglect a written plan for the operation, agreed by everyone involved.

FIVE MAJOR SHIP FIRES IN RECENT YEARS TO REMEMBER

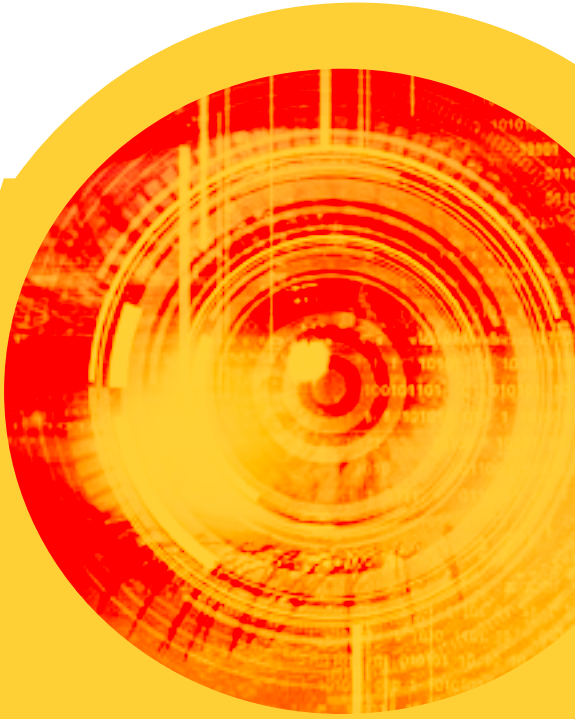
MSC Flaminia - July 2012
MSC Flaminia is a German container ship which caught fire on 14 July 2012, claiming three lives (two confirmed dead and one missing) and forcing the crew to abandon ship in the middle of the Atlantic Ocean. After the fire had been brought under control, the stricken container ship was towed to Europe and arrived at Wilhelmshaven, Germany, on 9 September 2012. In March 2013, she departed Wilhelmshaven for Mangalia, Romania for repairs which were finished in July 2014.

Maersk Honam - March 2018
Maersk Honam is a container ship operated by Maersk Line. The vessel caught fire on 6 March 2018 while sailing in the Arabian Sea. Five members of the crew of twenty-seven were killed, including one rescued crew member who died later from injuries.

Yantian Express - January 2019
On 3 January 2019 the Yantian Express suffered a fire aboard. The ship was en route from Colombo (Sri Lanka) to Halifax when the fire broke out about 800 nm from the Canadian coast. All twenty-three seamen were evacuated on 7 January 2019 by the tow-boat "Smit Nicobar". Seven days after the fire broke out the salvage team was able to bring the fire under control and bring back five seamen left aboard the ship.

Grande America - March 2019
On 10 March 2019, Grande America caught fire while traveling the Atlantic Ocean between France and Spain on its route from Hamburg to Casablanca and sank in the Bay of Biscay on 12 March. The twenty-seven people on board were rescued by the Royal Navy ship HMS Argyll after they abandoned ship on.

X-Press Pearl - May 2021
On 20 May 2021, X-Press Pearl caught fire off the coast of Colombo, Sri Lanka. The vessel was engulfed in flames by 27 May and declared a total loss. It was still afloat, and the fire was thought to be under control by Sri Lankan firefighters by the late hours of 27 May 2021. After burning for twelve days, the vessel sank on 2 June as it was being towed away to deeper waters. The incident was deemed the worst marine ecological disaster in Sri Lankan history.



PREVENTING FIRES ONBOARD: *Technology is the key*

The best way to resolve any challenge is to prevent it. The industry seems to have recognized the severity of the issue, especially on container ships, and is trying to be taking initiatives to tackle it. Currently, an IUMI working group on container ship fire safety is working on a draft of recommendations to put before IMO for improved fire detection and firefighting capabilities onboard container ships. Amid an increase of container ship fires in recent years, five partners in the Cargo Integrity Group issued last year the 'CTU Code – a quick guide' to serve as a route-map for the CTU Code and to assist wider understanding of good packing practices.

Among the bright initiatives that do not seem enough to address the issue, innovation and technology with the use of AI and sophisticated algorithms, as well as blockchain, have unveiled potential to bridge the gap.

Currently, the Misdeclaration of Dangerous Goods pilot project by the Maritime Blockchain Labs (MBL) seeks to evaluate how blockchain could support the proper documentation and declaration of dangerous goods. South Korean shipbuilder Hyundai Heavy Industries has developed an AI-based fire alarm system that helps detect the outbreak of fires more quickly, while there are firms, like Zim, are testing the use of AI to identify potential cargo misdeclaration. What is more by using video analytics operators can minimize fire risk; video cameras are widely used in shipboard machinery spaces to detect hazardous conditions. A shipboard camera network combined with video analytics creates a highly efficient means for rapidly detecting oil mist, a precursor to a potential fire or explosion, allowing critical time to take action before disaster strikes.

Maybe these are only a few examples of the upcoming opportunities that technology can open up for the industry to deal with fire incidents onboard.

Good Bunkering Practice

Written by Vijay Rao & Patrick Britton

Bunkering is a routine but essential part of vessel operations, yet frequent disputes ensue because of fuel quality problems causing machinery damage or loss of propulsion and can culminate in substantial claims, for example, where there is considerable disruption to vessels' schedules and operations or where the delays result in cargo damage, demurrage claims such as when the fuel oil has to be removed from the vessel and the tanks cleaned.

A well considered bunker procedure and diligent practice is essential to ensure that bunkers of the correct specification, quality and quantity are stemmed safely and efficiently. The documentation to establish adherence to such procedures will be extremely important in the event of a dispute ensuing.

The International Safety Management Code (ISM) requires that as per the vessel's Safety Management System a detailed bunkering procedure is implemented, that it be based on a detailed risk assessment and that it includes the bunker transfer operation, sampling procedures, training of the crew, and designates a person in charge of the requisition and bunkering operations.

A greater level of cooperation between all concerned parties is now required, and expected, given the changes in the emission regulations, contamination issues that have been experienced, and the availability of the different grades of fuel oil.

Bunker planning

An important stage of the bunkering process is for the receiving vessel to prepare a detailed bunkering plan for the required grades of fuel and quantities. Area of operation, availability of the appropriate grade of fuel and cost of fuel are important elements of the planning process and therefore needs to be considered by the charterer and vessel operator in liaison with the receiving vessel.

For the safe operation of the vessel the Master must ensure that an adequate quantity of fuel oil of the appropriate grade and specification is available on board to complete the passage. For a vessel to be able to undertake its intended passage safely, the fuel oil stemmed must meet the statutory requirements (sulphur content and flash point), be of the grade and specification suitable for consumption in the installed machinery, and be of a quality that will not cause any operational problems or machinery damage.

Depending on the emission compliance strategy adopted a vessel might need to stem multiple grades of fuel oil.

The following information is therefore necessary in order to prepare the bunkering plan:

- Accurate route and passage planning including entry and passage through Emission Control Areas (ECAs).
- Vessel service speed requirements as per charter party
- Current reserve on board of each grade of fuel oil (include any lubrication oil constraints)
- Bunkering locations and availability there of the specific grades of fuel that can be arranged without undue deviation
- Tank capacities (not more than 95%) and segregation requirements.

The analysis is dependent on the accuracy of the passage planning and bunker reserve on board, notwithstanding weather and hull condition which could increase the consumption and lead to insufficient fuel for the passage if not properly accounted for.

The following further information should be agreed between the receiving vessel and the bunker supplier and documented.

- Sequence of loading in case of multiple grades
- Pre and post bunkering documentation required
- Joint gauging and witnessing of samples
- Agreeing on the contractually binding fuel sample
- Sampling requirement – location, procedure and number of samples to include for lab analysis and surveyor sample as applicable.
- Final tank quantities and ullage
- Maximum allowed bunkering rate for each grade

It may also be prudent to specify additional fuel oil properties such as the viscosity, pour point and cold flow properties. These might be dependent on limitations such as in the vessel ability to adequately heat the fuel in the tanks while operating in cold climates or to handle low viscosity fuels.

The receiving vessel may also wish to consider appointing an independent surveyor to witness the bunkering and sampling particularly where there has been previous experience of quality issues or disputes in the area where the bunkers are to be supplied, or where there is any concerns that the correct procedures may not be followed.

Contractual best practice

When the bunker plan has been formulated the following should be agreed by way of the supply contract and where applicable in the charter party.

The latter will address the ownership of the fuel on board. It is important that these requirements are agreed, well documented and communicated to all concerned parties within the terms of contract.

- Grade of each fuel oil
- Specification of fuel oil, as a minimum specify the ISO8217 standard.
- Sulphur content for compliance or suitable for the installed scrubber
- Quantity of each grade of fuel oil

It is, however, possible that fuel is supplied which complies with the ISO8217 Standard, but which is not suitable for use by the vessel. Where the bunker contract is subject to English law, a warranty by the supplier that the bunkers are fit for use by the vessel is likely to be implied into the contract (even if it is not expressly stated), although some suppliers' terms exclude this warranty.

Frequently the supplier will impose its general terms and conditions, published on its website, by referring to them in the Bunker Confirmation or invoice. These will determine crucial issues such as the law and jurisdiction of the contract, mandatory procedures in the event

of a dispute, the retention of title by the supplier until payment is received, and provisions limiting the supplier's liability. Strict adherence to the supplier's procedures is necessary to preserve the buyer's ability to pursue a claim for breach of contract in the event of a quantity or quality dispute.

Suppliers' terms frequently incorporate very short time bars for notification of quality issues (frequently 14 days, but sometimes as short as 24 hours), and it is essential that any issue is therefore notified within the required time period. See the Club's Article "Bunker Time Bars: Buyers Beware".

Supply contracts also frequently provide that the supplier's sample shall be binding in the case of a dispute.

The charterparty

Where the vessel is on time charter, which provides that the charterer is to provide and pay for the bunkers, then the buyer under the sale contract will be the charterer and not the owner. Care will be needed in drafting the charterparty terms as they relate to bunkering.

It is of course in the interests of both owner and charterer that the fuel grade and specification are clearly set out in the charterparty.

In addition, the owner will want to include a warranty that the fuel is fit for use by the vessel (such a warranty may be implied where the charterparty is subject to English law), and will need to consider carefully what other terms they wish to include: for instance, a provision that the charterer does not have authority to bind the owner or the vessel nor to create a lien over the vessel (although in some jurisdictions even such a clause would not be enough to prevent a bunker supplier having a lien for unpaid bunkers).

The charterer, on the other hand, will want to ensure so far as possible that the terms of the charterparty and the sale contract are consistent. Important issues to consider include:

- Binding sample: the vessel owner is likely to want the drip sample taken from the receiving vessel manifold to be recognised as the representative sample for the purpose of any dispute under the charterparty; however, the supplier's terms will almost always provide that the supplier's sample is binding under the sale contract;
- The charterer should try to ensure that the supply contract specifies the origin of the supplier's sample – even if the supplier won't agree to the sample being taken from the receiving vessel's manifold, the risk of discrepancy will be reduced if the supply contract specifies that the sample should be taken by continuous drip from the bunker barge manifold;
- Charterer could require the appointment of their own representative (perhaps a surveyor) to attend the bunkering and take samples on behalf of the charterer;
- Charterparty requiring that the owner provide sealed and signed samples to the charterer
- If the bunkers are unlikely to be burned immediately, how can the charterer know of a quality problem in time to give timely notice under the bunker sale contract? A requirement that a sample be sent immediately for routine testing might enable any quality issue to be identified at an early stage.

Supplier relations

The buyer will specify the fuel oil required and the supplier is responsible for providing fuel oil that meets the agreed specification. The supplier is required to ensure the quality of fuel oil by implementing appropriate control measures within the production and supply chain.

Prior to making a purchase contract, where possible, the buyer should verify that the supplier:

- is licenced by the local authority (potential fines in some countries for use of an unlicensed supplier)
- has a quality management system
- will issue a Certificate of Quality based on fuel analysis in accordance with the ISO8217 standard specification
- has a track record of supplying the required grade of fuel.

Additionally, it should also be verified that the bunker barge operator, if independent of the supplier, has a quality and safety management system in place.

Bunkering Operation

The supplier or representative should provide the following documents for the bunkering operations to the recipient vessel and well enough in advance to allow for any discrepancy to be raised and discussed, thereby avoiding any last-minute disputes and delays.

- Certificate of quality issued in accordance with ISO8217 standard
- Safety Data Sheet (SDS) required as per SOLAS Chapter VI Regulation 5.1
- Bunker Delivery Note (BDN)

The issue of a BDN is required as per Marpol Annex VI Reg 18.5 and must include details as per Appendix V of Marpol. BDN templates issued by local authority must take precedence over Marpol issued BDN template. It is imperative that the BDN is appropriately completed and the entries should be verified by the receiving vessel.

The BDN must include a declaration that the fuel oil is in conformity with MARPOL Annex VI, Reg 18.3 and that the sulphur content of fuel oil supplied does not exceed the limit value as per Regulation 14.1 or 14.4 or else a specified sulphur value has been stated where for example a scrubber has been installed or, in some cases, where exemption has been granted for trials of emission control technology in accordance with MEPC 286(71).

In addition to the above documentation the following should be communicated and agreed between the supplier and the receiving vessel:

- calibration/type approval certificates- flow meter, drip sampler, remote level gauging etc.
- tank volumes start and completion
- local reporting obligations- eg. bunker transfer permit, signed checklist by both parties
- checklists completed - pre-bunkering, during transfer and completion
- timeline of events recorded
- communication, emergency procedures and rates of transfer documented
- Sampling locations and protocols
- Agreement on location of source of binding sample

Some local authorities also require a certificate of inspection to be issued signed by both parties when a joint inspection has been carried out.

A toolbox meeting should be undertaken with all involved parties to review and record what has been agreed before commencement of the bunkering operation.

A checklist should be prepared and used for each stage of the operations as a matter of good bunkering practice by the designated representatives of both parties.

A safe means of personnel transfer between the vessels should be provided, the use of a non-manriding crane is not acceptable. Where there are practical and safety concerns for personnel transfer consideration should be given for remote inspection.

The bunkering operation is to be controlled by the designated person, generally the chief engineer, in line with the vessels International Safety Management procedures and is to be undertaken by a designated bunkering team which should include both deck and engine personnel.

Rest and work hour requirements must be met, especially in case of simultaneous operations, with consideration given for non-critical operations to be postponed.

Sampling

An official sample of bunker fuel is required as per MARPOL Annex VI Reg. 18 and is to be provided by the supplier along with the BDN.

Representative samples are also required for carrying out independent laboratory analysis and a ship sample should be retained for any further testing that may be required as highlighted, for example, in claims where contamination could be an issue.

As per the guidance in MEPC 182(59) the samples should be drawn at the receiving ship's inlet bunker manifold and should be drawn continuously throughout the bunker delivery period.

In case of more than one supplier or, for example, where multiple vessels are used for supply of the required quantity of bunkers, a separate set of samples should be available / drawn along with the applicable BDN.

General sampling procedures:

- A type-approved automatic or manual continuous drip sampler.
- A clean collection container of about 5 litre capacity capable of being sealed at the needle valve in order to prevent contamination.

Bunker in progress

Drip sampler and sealed container

- Continuous uniform flow to be maintained in order to fill the container with a sample representative of the entire bunkering process, avoid changing the flow rate. Where required the container should be changed, ensuring that containers are sealed in agreement with all parties. Experience suggests that the sampling rate needs to be closely monitored by the crew member manning the manifold to prevent overfilling of the container but also to ensure an adequate quantity of sample is collected.
- Upon completion of bunkering, the seal between the container and needle valve is broken
- The sample is thoroughly shaken for homogeneity and immediately transferred into clean 750 ml sample bottles simultaneously filling the samples in portions (i.e. not sequential) until the bottles are filled with at least 400ml in each and be careful to prevent any contamination of the samples.

A minimum of four samples representative of the stemmed bunker should be collected, ideally with additional samples being collected where possible and appropriate such as where a surveyor has been appointed or where a sample is required by the Charterer.

- MARPOL sample (statutory for receiving vessel)
- Supplier's sample (may request additional and should be agreed in advance)
- Ship's additional ship sample in case dispute ensues
- Sample for laboratory analysis

A tamper proof seal and label with the below information must be fitted to each sample bottle

- Vessel details and location
- Supplier details and tanker or terminal name
- Sampling location
- Grade of fuel bunkered
- Seal number for the sample bottle
- Signature of supplier and receiver and stamped

Initial sealing, breaking of seal of the collecting container and transfer to sample bottles and labelling must be witnessed and signed by both parties. A statement must be recorded to this effect.

The seal numbers should be recorded on the BDN including any additional samples that might have been taken on either side of the hose connection.

The BDN and the labels of the sample bottles must be signed by both parties only upon completion of the bunkering and when the quantities have been verified. Due care must be taken in this custody process to avoid any errors arising which could have detrimental consequences when pursuing or defending a potential claim in case of a dispute.

Where the supply contact says that the supplier sample is binding, the receiving vessel should ascertain the origin of the sample. Where there is any doubt as to the veracity of the sample, the receiving vessel should issue a letter of protest as detailed below.

Letter of protest (LOP)/Note of protest (NOP)

Any deviation from the above procedures should be addressed and recorded at the time of bunkering.

A letter of protest should be issued in such situations, detailing the discrepancy. Having preprepared templates could prove useful in such a situation. The Club will be able to assist the Member in this regard.

Whilst not exhaustive, some of the reasons for an LOP include:

- Short supply of bunkers
- BDN not issued or not in accordance with the amended MARPOL VI Reg. 18.5 requirement
- Source of the sample provided by supplier is unknown or not representative per MEPC 182(59) or as per local regulations. In such instances the label should be signed "for receipt only - source unknown"
- Refusal to grant access to the bunker over refusal to carry out joint inspection
- Discrepancy in stated properties in BDN such as temperature, water content, and density as may be verified by on board test kits
- Lack of appropriate documentation, calibration certificates, approved tank tables and plans

Where there is any doubt as to the veracity of the MARPOL Sample provided, or where the supplier fails to provide a MARPOL sample or an agreed binding sample, the receiving vessel should endeavour to seek the agreement of the bunker supplier to utilise the vessel's representative sample [MEPC 182(59)] as the MARPOL and binding sample. The sample should be labelled and numbered for inclusion with the supplier delivered sample, when provided, and additionally recorded in the BDN where agreed. The records of the additional samples should also be maintained in this case. An inventory of a complete set of sample kits as provided by testing laboratories should always be maintained on board for this purpose.

Dispute resolution

The Owner or Charterer should immediately notify its P&I Club and/or FD&D provider in the event of a dispute. The Owner's Hull & Machinery underwriters / Charterers' Damage to Hull underwriters should also be notified if the vessel's machinery has been damaged. If the seller was not the physical supplier, a buyer should also consider notifying the latter in the event that it is possible to bring a claim in tort.

Where not already in place an independent surveyor should be immediately appointed for protecting the interest of the party.

In certain jurisdictions a supplier of fuel oil may have a maritime lien against the vessel. Where a vessel is on charter, Owners can try to protect the vessel against such claims by serving a 'prohibition of lien notice' on the supplier before the supply takes place.

The supplier is then on notice that the fuel oil is supplied for the account of the time charterer alone and no lien is attached to the vessel. The BDN may be similarly endorsed by the ship owner, although the legal effect is questionable.

Dispute resolution procedures may also be specified in the contract, including how the laboratory analysis is to be carried out in case of a fuel oil quality dispute.

Retention and storage

The representative sample per Regulation 18 of Marpol VI 'Marpol sample' is required to be retained for 12 months or until the complete bunker supply has been consumed, whichever is the longer period. The PSC will request for the MARPOL sample along with the BDN in case of an alleged violation of the emission regulations.

A record of the samples taken and retained should be maintained, including details of appropriate disposal upon completion of the statutory period and when there is no ensuing dispute.

The BDN must be retained by both parties for a period of three years and be readily available for PSC inspections.

Similarly, the supplier is also required to retain the BDN for the same period of at least three years and available for verification by the port state. The supplier should retain their representative sample for a minimum of 30 days (3 months recommended) and longer in case of a dispute, when it should be retained until resolution.

The bunker sample should be stored outside the accommodation and preferably outside the engine room in a sheltered space away from direct exposure to sun light and not subject to elevated temperature, recommended as at least 28°Celsius below the flash point. A copy of the Material Safety Data Sheet must be displayed at the location.

General recommendations
In order to be able to draw out fair terms of contract close cooperation between parties involved in the bunkering process is strongly encouraged. Although experience suggests that this can be difficult to implement. The possibility for longer term contracts with suppliers should be explored where the vessel operations allow.

It is imperative that the contractual terms are carefully considered (both the supply contract and any relevant charterparty) Diligent pre-planning, following well established procedures, maintaining full documentary records, duly signed/ witnessed and taking careful and representative sampling is paramount in avoiding a dispute and to support resolution where dispute arises.

MEPC.1/Circ. 875 - Guidance on Best Practice for Fuel Oil Purchasers/ Users for Assuring the Quality of Fuel Oil Onboard Ships, also provides valuable information and guidance.

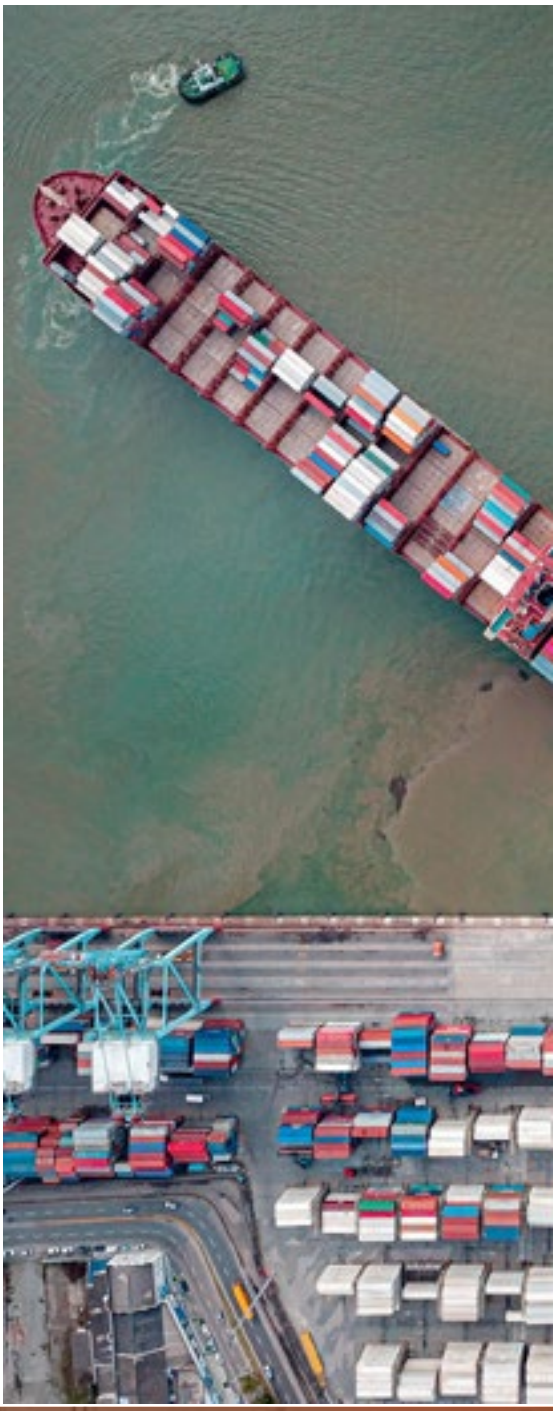
Crew understanding and training is imperative in order to ensure that the bunkering procedures are being strictly adhered to and that records are being meticulously maintained.

Although limited in their range of analysis, onboard testing kits could prove useful in verifying the basic properties of the fuel oil such as density, water content and viscosity and raising any concerns for an early intervention in anticipation of a potential dispute. The on-board testing should, however, not be considered a substitute for laboratory analysis carried out as per ISO specification.

The factors that need to be taken into consideration are the quality assurance in the supply chain, contractual compliance, segregated stemming and storage, fuel analysis and fuel management.

Members are encouraged to make use of the ISO 13739:2010 and regional standards such as SS600 & SS524 Singapore Standards for Code of practice for bunkering. Local requirements for bunkering must always be followed. For vessels trading to the United States the USCG 33 CFR 155 also requires that their requirements are incorporated within the bunkering procedures, followed, recorded and available for inspection.

Members are encouraged to maintain a register of all fuel suppliers in their area of operation and to regularly update the information based upon their fleet experience and other pertinent information that may be publicly available such as the IMO Global Integrated Shipping Information System (GSIS).



For further articles on the topic:

https://www.steamshipmutual.com/publications/Articles/compliance2020sulphurcap092018.htm
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https://www.steamshipmutual.com/publications/Articles/turkeyundeclared-bunker-cases-at-turkishports022020.htm
https://www.steamshipmutual.com/RA60_Bunker_fuel_quality_problems.pdf

Car carrier fires and the associated risks with Electric Vehicle transportation

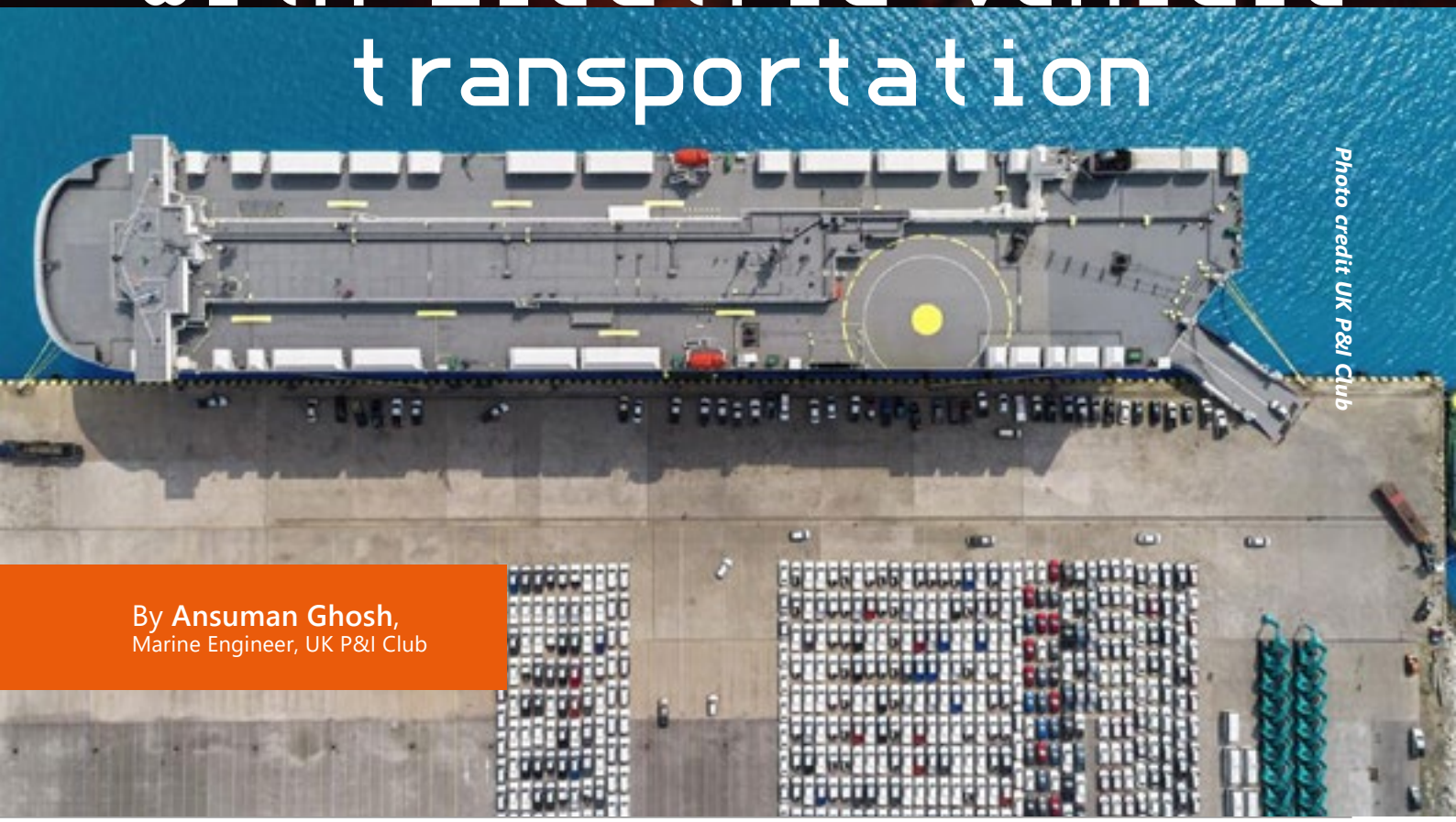

Photo credit UK P&I Club

By **Ansuman Ghosh**,
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With an increasing requirement globally to use alternative sustainable fuels and minimise carbon emissions, share prices for Electric Vehicle (EV) manufacturers like Tesla have doubled in recent months. Car carrier charter rates, particularly regarding transporting EVs, are soaring.

With this growth and demand has come an increased awareness operationally of the risks involved with transporting EVs on ro-ro and ro-pax vessels. Many ro-ro vessel operators are already carrying EVs and alternative fuel vehicles with a cautious approach. In October this year, the Maritime and Coastguard Agency issued a consultation document regarding the safe carriage of EVs and charging facilities on ro-pax ferries, so the safety concerns are clearly being considered on a wider level throughout the maritime industry.

Clearly, these new car types are not inherently unsafe, but, when any new technology is introduced, there is always a potential for unintended consequences, and it is important for every stakeholder to understand the risks to mitigate them effectively. It is timely, therefore, to consider recent case studies of fires on ro-ro vessels, along with the associated safety and risk aspects that should be highlighted during operation, especially with consideration to EVs.

Recent incidents related to fires starting in vehicle decks

Over recent years there have been numerous fires on vehicle carriers, some of which have been attributed to faults in the vehicles being carried onboard. The outcome of these vehicle carrier fires have, in the main, been significant. We have summarised a few of these incidents below.

On the MV Honor in February 2017, a fire in the upper vehicle deck was attributed to a fault in the starter motor solenoid in one of the vehicles being transported. The fire led to extensive damage to the Honor's vehicle decks as well as its cargo of about 5,000 vehicles.

In May 2018, a fire started on the 11th deck of the Auto Banner. The fire was alleged to have been caused by the over-heating of one of the used vehicles on board. The fire was cooled by helicopters dropping water from the air and more than 40 fire engines spraying the hull. The entire crew of 28 were safely evacuated without any reported injuries.

Grande America suffered a fire in March 2018 and subsequently developed a starboard list, causing it to capsize and sink in a depth of around 4,600 metres. The resulting oil spill stretched for 10km and the ship was carrying 2,000 cars and 365 containers, of which 45 were deemed to hold hazardous substances.

Sincerity Ace caught fire in the Pacific on New Year's Eve 2018 with more than 3,500 cars onboard. The crew had to abandon the vessel, and whilst 16 crew were rescued, five tragically died as a result of the incident.

In June 2019, Diamond Highway had to be abandoned by its crew in the South China Sea, due to fire, whilst carrying 6,354 cars. Thankfully, all 25 crew were rescued.

The above are just a few examples of the catastrophic effect of fires onboard car carrier vessels and they serve to illustrate the importance of thorough safety procedures and adequate fire-training. With regards to transportation of EVs, as numbers increase it will no doubt become evident over time where the principal risk factors lie with these vehicles.

Why are EVs different from standard motor vehicles?

To consider the risks involved with carrying EVs in particular, it is worth understanding the technology of their design which makes them different to conventional petrol and diesel vehicles.

There are three types of EVs:

Electric Vehicles (EVs) or Pure EVs

Plug-in Hybrid Electric vehicles (PHEVs)

Hydrogen Fuel Cell vehicles (FCEVs)

EVs rely on being recharged from an external power source, typically a specialised charge point, and are the greenest way to drive, with no tailpipe emissions. Plug-in hybrid electric vehicles (PHEVs) usually have a smaller battery than a pure-EV, but also have a conventional petrol or diesel powertrain. A PHEV can run on the engine alone, and even use the engine to top up the car's battery, but are most efficient when used in electric mode as much as possible. Although rare, hydrogen fuel cell vehicles (FCEVs) are also classed as electric cars. They do not require charging, and refuelling only takes a few minutes, similar to refilling at a petrol station. However, this needs to be done at a dedicated refuelling site.

As technology progresses it is clear that battery sizes in electric cars will continue to increase; there has been continuous technological advancement in terms of storage, driving range and charging speeds for the battery. This fast-paced technological

advancement creates challenges in terms of battery manufacturing quality. Additionally, these high-performance energy storage systems must be intrinsically tolerant of all conditions, including overcharge, short circuit, fire exposure, mechanical shock, and vibration.

Lithium-ion cells and batteries play a dominant role in portable applications and have now entered the field of automotive applications. If a lithium-ion battery catches fire, it can result in temperatures exceeding 1,000 °C. In recent trials, large amounts of water were found to be an effective fire-fighting agent, primarily as the cooling effect prevented vehicle components from catching fire. As with most fires, battery fires also produce highly toxic gases.

Potential risks associated with transporting EVs

The following are all potential risk scenarios that could arise when transporting EVs:

- Battery fire during on-board charging of the EV
- Battery fire due to increase in temperature from a fire in the surrounding area
- Battery fire after an accidental impact during cargo operation or vessel movement in bad weather
- Fire or explosion due to the escape of hydrogen from the fuel cell hydrogen pressure tank resulting from fire in the lower deck or surrounding area
- Battery runaway due to an internal short circuit resulting from an impact, or poor battery quality leading to fire when the battery internal safety mechanisms stop working

In addition, a lithium-ion battery exposed to temperatures above 150 °C from a surrounding fire might start to discharge toxic gases with possible ignition. In case of a fire in the vicinity of a FCEV it is possible for the pressure to increase in the hydrogen tank from an external temperature increase. A significant amount of hydrogen could then escape forming flammable mixtures which could be ignited by non-explosion-proof equipment, such as lamps and fans.

Charging EVs on-board and related risks

To date, the safety of charging EVs on carriers has not been widely discussed, however as this is an area on which the UK Maritime and Coastguard Agency are currently consulting it is clearly an area to which consideration needs to be given.

Operational changes that could minimise risk

Inform and train

It is important to inform the crew of the risks the vehicles present and to adapt the personal protective equipment onboard accordingly. Moreover, it is important for the crew to know where such vehicles are located onboard. EV and PHEV/FCEV vehicles must be clearly marked on the stowage plan so that emergency services can act accordingly. The training and equipment (protective clothing, respiratory protection, and possibly thermal imaging cameras) of the rescue workers might need to be adapted to these risks.

Cooling or sprinkler systems

Unfortunately, sprinkler systems are located above cars from the deckhead (ceiling) down, so would have a marginal effect on cooling lithium-ion batteries as they are located close to the car floor. In the case of fires involving EVs, it is especially important to cool down the material that is on fire as well as its surrounding area. This requires large quantities of water. Therefore, to avoid endangering the stability of the ship with the extinguishing water, ensuring the unhindered runoff of the extinguishing water is of great importance. Another important factor in this regard is that the runoffs must be kept free from burnt material and cargo. High pressure water mist systems seem to be particularly suitable due to their inerting and cooling effect, so these systems are preferable for battery fires.

Effective cargo operations

Watch-keeping and fire rounds are essential to keep a close eye on damaged cars, coolant leakages, indications of heat, and venting. Use of thermal imaging scanners by the cargo watch-keepers is suggested, and some vessels are provided with CCTV cameras for monitoring which can lead to early detection.

Effective drill schedules and realistic onboard drills

A quick muster, decision making, and effective teamwork can ensure a fire is under control quickly before it spreads. EV and PHEV/FCEV vehicles should be transported in special areas equipped with appropriate detectors, fire extinguishing equipment, and fire extinguishing agents. In the case of a fire, the possibility of separating vehicles by means of a water wall or mobile partitions could be explored.

Detecting gases or gas mixtures

which escape from faulty batteries at the earliest opportunity makes it possible to locate and fight fires at their earliest stage. Escape of hydrogen on a closed or even a semi-open deck can easily lead to an explosion followed by a fire. For this reason, it is recommended that fuel cell-powered vehicles operated with hydrogen should exclusively be transported on open loading decks. It is also important to note that spaces where hydrogen can escape must not be protected by a CO2-based fire suppression system, as CO2 when being discharged, may ignite hydrogen.

Fuel cell vehicles present a special risk if hydrogen is used as fuel

The hydrogen is stored in the vehicle tank under high pressure. When heated strongly, for example due to a fire on the same deck or the one below, the pressure in the tank will increase until the overpressure relief valve opens and the hydrogen is discharged. Since hydrogen is lighter than air, it will primarily collect under the deckhead (ceiling) of the vehicle

deck and could cause an explosion. Currently prevention of explosions are targeted at gases that are heavier than air and require appropriate explosion protection on vehicle decks only for installations near the deck (floor).

Conclusion

As EVs are still relatively new, there is limited available data regarding their potential fire risk. Until reliable data is available it is recommended that owners adopt a cautious policy for the EVs carried onboard. Fighting fires in EVs introduces new challenges of which the crew should be made aware and for which they should be specially trained. Fires in battery packages are difficult to put out but they can be cooled by use of water, and leakage from a hydrogen fuelled vehicle is not very likely but, if ignited, will cause a fire with a high heat release rate.

There are number of areas where further investigation is required, such as the ideal state of charge of the batteries, effectiveness of different combinations of fire detection, gas detection and fire-fighting installations in areas which might be used specially for the stowage of electric vehicles. In the days ahead, with further reliable data and investigations, there might be additional design changes and operational requirements. It is important to keep in mind however, that although the technology driving the cars being carried on ro-ros is changing, the existing ro-ros will probably not undergo any substantial design changes in terms of firefighting capability or fire detection. Unfortunately, industry regulations are frequently slow to respond to developing market trends, and so the onus will be on the operating procedures for ships and their crew to mitigate this new risk.

NEWSFLASH

At the time of going to publication, The Report picked up an update on the Felicity Ace, a car carrier with 4,000 vehicles onboard, (some of them fitted with lithium-ion batters), which is currently ablaze off the Azores. The report says that firefighters are struggling to put out the fire.

"The intervention has to be done very slowly," João Mendes Cabeças, captain of the nearest port in the Azorean Island of Faial said.

Lithium-ion batteries in the electric vehicles on board are "keeping the fire alive," Cabeças said, adding that specialist equipment to extinguish it was on the way.

They also cannot use water because adding weight to the ship could make it more unstable, and traditional water extinguishers do not stop lithium-ion batteries from burning, Cabeças said.

Forensic Accounting in Marine Claims and Cargo Losses

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Since the COVID-19 pandemic began, the logistical challenges, delays, and risks to the global marine supply chain have been well documented on both TV and the internet. While ships continue to sit at ports for extended periods of time, sales backlogs and other intangible reputational damages have mounted when companies cannot ship goods to customers as intended.

While the delays in cargo shipments are generally not insurable, physical damages or loss to cargo may be. Additionally, the risks of physical damage or theft can be much greater the longer ships are backlogged and the longer cargo either is not in transit or is being stored at less secure locations at ports. Perils such as explosions, fires, floods, hurricanes, earthquakes, and even tornadoes could threaten the cargo while in storage. All of these issues amount to great concern for insurers, as the risk for a major loss can occur at any moment.

Forensic accountants assist insurers in assessing marine and cargo losses, and their insight can be pivotal to the claims process.

Cargo Stored in Warehouses

One of the most common marine insurance claims is associated with inventory stored in warehouses. These losses occur due to perils such as natural disasters, structural collapses, equipment failures, and other physical damage events.

Imagine a scenario in which a large warehouse and distribution center for wine and spirits suffers storm damage. In this scenario, the facility quickly returns to full operations; however, the building repairs take significantly longer. During the initial storm, portions of the collapsed roof destroy bottles, cases, and pallets of inventory, making a physical count of the damaged goods impossible.

Forensic accountants can analyze records to determine if the inventory was in storage or in transit, as the status of the inventory may have different policy provisions. A forensic accountant can create detailed schedules and databases by product which identify the quantity of goods lost and the associated purchase costs, selling prices, taxes, etc. to determine the amount of damaged goods at the valuation allowed for by the policy. These databases would also be pivotal in ascertaining the amount of excise tax for each product that was not incurred, as the product was not ultimately sold.

Cargo in Transit

Goods are frequently damaged in transit. This often includes large custom-made equipment that does not make the journey intact or commodity goods delivered on a truck or container that are not delivered in the same condition as when originally shipped. For damage to custom-made equipment, analysis is commonly focused on the costs incurred to repair the damaged equipment.

In these instances, forensic accountants can assist in the measurement of the costs incurred as allowed under the policy. These losses can also include business interruption, extra expenses, or contingent business interruption. In other instances, goods damaged in transit may be easily replaced from inventory, such as with manufacturers or retailers, or they can be purchased on the open market. Supply chain problems have recently complicated the replacement cost issue.

Cargo on the Water

Cargo damaged on the water can have an added level of complexity if a portion of the shipment was damaged and/or that damage has impacted the volume or weight of the commodity. In these instances, forensic accountants use every available resource to correctly determine the volume or weight of the damaged goods and the afforded valuation as allowed under the policy.

Theft, Missing Goods, or Unknown Disappearance

Marine claims that are ultimately deemed theft, missing goods, or unknown disappearance can present themselves in different forms.

When a theft has occurred, forensic accountants can help the adjuster by analyzing records, inventory purchases, sales, shipping records, pre- and post-loss physical inventory counts and other available data to quantify the amounts that are missing and may have been stolen. It is important that the accountant understands what the records represent and how they are relevant to the claimed goods. The records provided may include other locations outside of the loss location; therefore, those records would not support the assertion that the goods were at the loss location at the time of claimed loss. Whenever possible, a post-loss physical inventory count should be performed to determine exactly what remained.

Time Element: Business Interruption and Extra Expense

As previously mentioned, business interruption and extra expense claims also arise in marine losses. Consider a case wherein a vessel collides with docks at a marine terminal where ships regularly load and/or unload cargo. Business interruption and extra expense losses ensue, since the damaged dock is unable to accept product and customers are unable to transport and store product at their dedicated storage location. For example, the insured might not be able to accept deliveries of refined or residual fuel oil to be stored in dedicated storage tanks, thereby generating a multi-year restoration period.

In this case, customer contracts and financial books and records are analyzed to evaluate the actual business loss sustained by the terminal owner. Accounting-related questions may be critical in projecting revenue for the business interruption calculation and may play a key role if the case results in litigation.

Contingent Business Interruption and Delays

Sales losses can occur not only because of physical damages to business operations but also the delay in the shipment of goods. For example, consider a scenario in which a domestic apparel company sustains losses caused by the delay in the arrival of goods due to a fire aboard a vessel in transit.

If the fire hadn't happened, the vessel would have delivered the goods to the port, and from there the goods would be transported to a distribution warehouse to be sold. However, the goods are delayed and are never sold during their intended season, forcing the cargo owner to liquidate the goods at a lower price.

To measure the lost sales of the delayed goods, a separate analysis of the anticipated net sales to be earned at the retail locations vs. net sales earned online and/or through wholesalers is needed. The situation also requires a review to determine whether the specific goods were deemed to be "seasonal." That determination relates to analyzing whether the goods could only be sold during a particular period of time, whether any repeat styles could be sold in a later period, or whether substitute inventory on-hand could have been sold to mitigate the sales loss.

This hypothetical case also includes a unique set of circumstances: the policyholder switches insurance providers at the same time the vessel catches fire, and the goods subject to the delay are covered by two separate parties. To accurately apportion the total loss amongst the two insurance providers, a meticulous review of the variables included within the bills of lading is required.

Hull and Marine Liability: Repair and Rework to Insured Property

Unfortunately, accidents happen, and property gets damaged. Consider a situation in which forensic accountants must assist in the measurement of damages due to inefficiencies and delays caused by the damage to a vessel.

For example, a shipbuilder had a vessel under construction and it was damaged while docked in their yard. As the shipyard must adhere to a tight schedule, it has limited time and physical space to work around a damaged vessel. In instances like these, a team of experts is assembled by the underwriters to lend their knowledge and experience to determine the damage calculations.

For instance, an experienced marine surveyor and an expert in shipbuilding would collaborate to determine the period of restoration. An experienced forensic accountant would contribute a measurement of the additional costs incurred during that period. In addition to quantifying the repair costs, forensic accountants are hired to evaluate the additional in-house labor required to work around the damage and attempt to meet the contracted delivery dates, as well as to measure the costs related to additional vessels delayed due to the damaged vessel occupying space in the yard.

Although large vessels may take years to build, shipbuilders often have numerous long-term government or commercial contracts underway. As such, the accountants provide an analysis regarding the effect and projected economic impact of the loss event for years to come associated with the damaged vessel and the other impacted vessels.

Review of Salvage Recovery Costs

In the event of an unforeseen natural disaster due to heavy winds, strong seas, rising tides, and other weather-related events that may occur, experienced marine surveyors and salvors are often retained or deployed to assist in the salvage recovery process.

Natural disasters can cause significant physical damage to insured marine contracts-in-progress; they may also potentially trigger liability obligations to third parties. While the benefit of retaining a marine surveyor with previous experience in negotiating salvors' contract terms and rates is paramount to protecting the interests of Underwriters, the forensic accountant may be added to the adjustment team to facilitate the gathering of the necessary financial data, to review and evaluate the scope of work, and to track and apportion costs to key coverages identified. This will assist in achieving common objectives of securing the necessary accounting information to mitigate a protracted exchange of Requests for Information (RFIs).

The continuous monitoring of insured barge and equipment values on marine projects in-progress may be necessary as well. Current replacement and insured values should be tested to avoid the possibility of vessels being declared Constructive Total Losses ("CTLs") as this may trigger the movement of an Insured vessel(s) from the Hull Policy to the Protection and Indemnity ("P&I") policy (as a wreck removal).

In addition to monitoring salvage recovery costs, the forensic accountant can account for estimated and actual repair costs incurred and evaluated by the surveyor, as well as residual values generated from the sale of insured vessels before or after final repairs. Depending on the size and complexity of the engagement, forensic accountants may be added to the adjusting/surveyor team to assist in the monitoring and allocation of costs to sue and labor, hull and machinery policy, contractor's equipment, P&I coverage, or possibly other coverages.

Retaining a forensic accountant early can provide tremendous value to the claims review process. Given their unique skill sets and experience handling large or small marine and cargo claims globally, they can prove to be invaluable resources for insurance companies, attorneys, third-party administrators and governmental authorities.

Getting to zero coalition
Closing the Gap: A new report

Report authors Dr Domagoj Baresic, Isabelle Rojon, Dr Alison Shaw and Dr Nishatabbas Rehmatulla

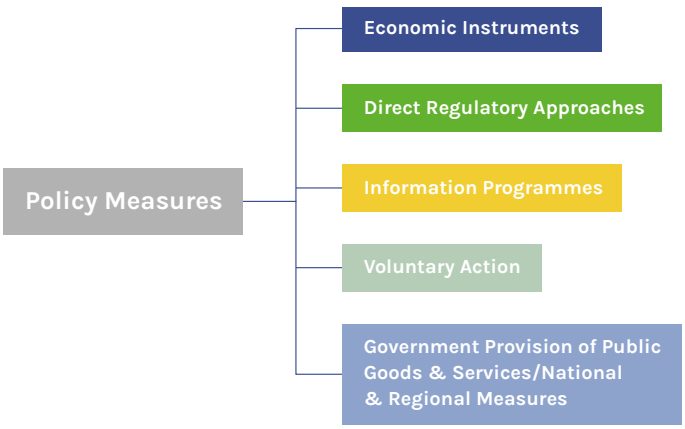
This new report published in January 2022 assesses where the shipping industry is at as it continues to work towards a greener future and decarbonisation. But as the report highlights, much more needs to be done to create effective polices as shipping is currently on an emissions trajectory that is dramatically out of line with the Paris Agreement temperature goal. Here is the Executive Summary taken from the much longer 84 page report that can be downloaded at the end of this article.

Shipping is a cornerstone of global trade and, as such, the GHG emissions created by shipping are significant and rising, accounting for almost 3% of global anthropogenic emissions (Faber et al. 2020a). Recent projections suggest that by 2050, shipping emissions will increase by between 90-130% of 2008 emissions by 2050 (ibid.). However, in April 2018, the IMO adopted the Initial GHG Strategy which set the ambition to reduce total annual GHG emissions by at least 50% by 2050, while pursuing effort towards phasing out GHG emissions this century as a matter of urgency, consistent with the Paris Agreement temperature goal. With emissions projected to rise and international targets having been set, the question becomes, how these targets can be met by shipping?

For international shipping to align with the IMO's Initial GHG Strategy, zero-emission fuels would need to become the dominant fuel source by the 2040s, gradually phasing out current fossil fuels.

However, there exists a significant competitiveness gap between incumbent fossil fuels and alternative zero-emission options. This gap is the result of the existence of market barriers and failures, availability issues, a relative lack of information and regulation on safety, as well as the price difference in the fuels, which in turn is driven by R&D, infrastructure, and investment requirements. Projections suggest that across the 2030s and 2040s, zero-emission fuels will be approximately double the price of conventional fuel at best (Lloyd's Register & UMAS 2020). As a result, there is an urgent need for policy to close the competitiveness gap and ensure shipping meets its decarbonisation commitments.

There is a range of potential measures to promote decarbonisation in shipping, including economic instruments or MBMs, direct regulatory approaches, information policies, voluntary initiatives, and national and regional action. This report provides an overview of different policy measures to address maritime decarbonisation and to close the competitiveness gap while enabling an equitable transition. Fairness and equity aspects are emphasised by e.g. the Initial IMO GHG Strategy. Therefore, the viability of any IMO climate policy instrument depends



to a large extent on how these aspects are considered and operationalised.

This report explains which policy options could help close the competitiveness gap and enable an equitable transition. It considers the policy options shown in the diagram below.

Overview of Economic Instruments

In many other sectors and countries, economic instruments, or market based measures (MBMs), are widely used by regulators to internalise the costs of pollution caused by economic activities, address market inefficiencies and decrease price differences between fossil fuels and alternatives. MBMs have been on the IMO agenda since 2003 and although discussions of MBMs in the IMO were suspended in 2013, MEPC 76 in June 2021 adopted a structured plan to start work on mid-term measures to cut GHG emissions from ships, which include MBMs alongside other measures.

MBMs can support the decarbonisation of shipping by closing the competitiveness gap between fossil fuels and zero-emission fuels by increasing the costs of using fossil fuels through setting a price on carbon, and/or reducing the costs of zero-emission alternatives, e.g. through tax breaks, RD&D funds, subsidies, or a combination of these. Additionally, MBMs can also help to mitigate some of the market failures and barriers which are slowing decarbonisation efforts.

Potential Uses of Revenue Generated by Economic Instruments

A key advantage of taxes/levies and ETS is the potential to generate significant revenues which could be used in different ways to help close the competitiveness gap and/or enable an equitable transition, for example:

- Addressing disproportionately negative impacts on States of GHG reduction measures as stipulated by the Initial IMO GHG Strategy.
- Supporting capacity development, technology transfer, and crew training in developing countries, in particular small island developing States (SIDS) and least developed countries (LDCs), to facilitate the development and uptake of zero-emission technologies and fuels, and the implementation of maritime climate policies.
- Funding climate projects in developing countries, SIDS and LDCs through existing or new climate finance mechanisms under the UNFCCC or other international organisations.
- Recycling revenues back into the maritime industry to support shipping decarbonisation by subsidising deployment of zero-emission fuels and technologies.
- Offering incentives to ships with lower emissions or carbon intensity compared to a certain benchmark.

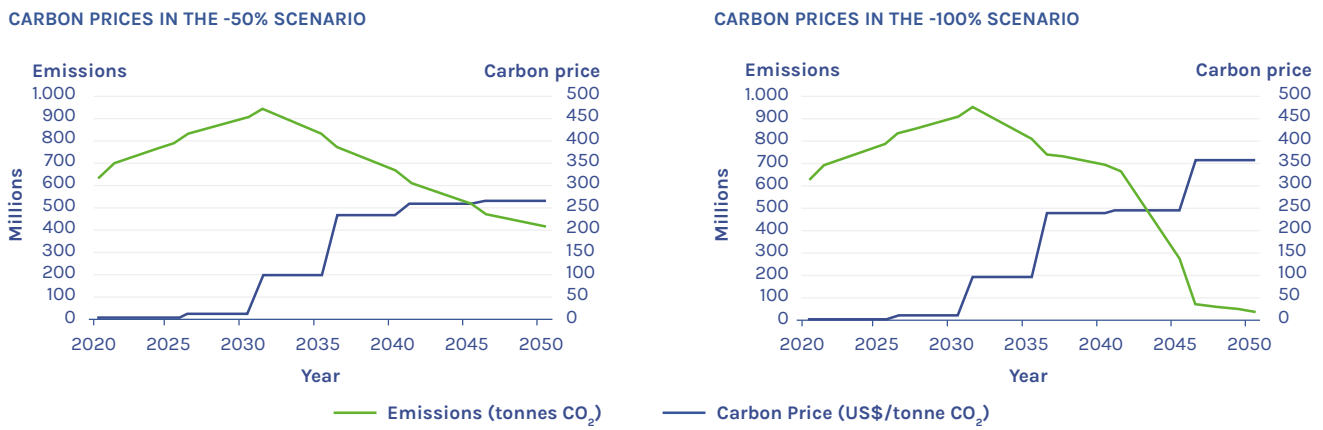
The most fair and effective allocation of revenues across the different options will require further investigation and deliberation. The management of revenue, from collection to allocation and distribution, is a fundamental aspect to be considered and for some of the revenue usage options, existing mechanisms could be used. An aim of any system should be to avoid significant administration and transaction costs.

Possible Level of the Carbon Price

Recent analysis based on techno-economic models provides estimates of how the carbon price might need to be set to enable a certain absolute emissions reduction trajectory. Two scenarios are produced, achieving a 50% and 100% reduction in absolute emissions by 2050 respectively. In both scenarios, the carbon price is started in 2025, but the emissions pathway followed has emissions rising until a peak in 2030. It should be noted that all carbon price estimates have been calculated solely to create the commercial case for reducing emissions. The modelling does not include the consideration of how to ensure that emissions mitigation is equitable.

In order to achieve 50% GHG emissions reduction by 2050 compared to 2008 (-50% scenario), the carbon price level averages US$173/tonne CO_2. For a 2050 target of full decarbonisation (-100% scenario), the average carbon price would only need to be slightly higher: around US$191/tonne CO_2. In both scenarios, according to the model, the price level begins at US$11/tonne CO_2 when introduced in 2025 and is ramped up to around US$100/tonne CO_2 in the early 2030s at which point emissions start to decline. The carbon price then further increases to US$264/tonne CO_2 in the -50% scenario, and to US$360/tonne CO_2 in the -100% scenario.

The carbon price trajectories and their associated emissions trajectories are shown in the figure below.



Even though the carbon prices as modelled in the two scenarios start at a very low level, they make two significant price increases over the following decade. These two price jumps may be challenging from both a political and practical business perspective; thus, it could be better to set the initial carbon price at a higher level than the model and follow a smoother increase, thereby easing potential economic shocks of sharp price increases. This could also help to ensure there is an emergence phase of the transition during the 2020s (e.g. funding RD&D to reach five percent zero-emission fuel penetration by 2030), which enables shipping-specific cost reductions prior to the more rapid uptake of new fuels scheduled for the 2030s.

Carbon prices could be lower than the model estimates if revenues generated by the MBM are 'recycled' to further support decarbonisation of shipping, for example by subsidising the deployment of zero-emission fuels and technologies. If all MBM revenue was recycled to support shipping decarbonisation, in theory, this could lower the carbon price level by up to half (but this would mean no revenue use for enabling an equitable transition and addressing disproportionately negative impacts on States). Depending on the level of revenue recycling, an MBM with global scope in the -100% scenario could be designed to have a carbon price level averaging between US$96-191/tonne CO_2 and reaching a maximum of between US$179-358/tonne CO_2 (see the figure below). In reality, the carbon price would likely be somewhere in this range, so that more revenue can be used to enable an equitable transition.

It is worth noting that the relationship between the carbon price and revenue collected depends on modelling assumptions, including global transport demand, future fuel cost assumptions and the emission reduction pathway for which only one scenario is being presented here. The collected revenue should be considered in terms of the total amount of available revenue which can be distributed over the period of decarbonisation (from 2025-2050), rather than assuming the revenue will be deployed only in the year it is collected. This scenario generally provides more subsidy/support for zero-emission fuels early in the transition when price spreads to zero-emission fuels are expected to be highest, and less towards the end of the transition when zero-emission fuels are more established and have a lower price spread. Other scenarios and spending profiles are conceivable.

Direct Regulatory Approaches

Direct regulatory approaches, such as the IMO's energy efficiency regulation (EEDI, EEXI and CII), often called command-and-control measures, could also be employed to close the competitiveness gap and include the following:

- Performance or Emission Standards: Set specific performance goals that must be achieved, but without mandating which technologies or techniques to use to achieve the goal.
- Technology Standards: Mandate which technologies or techniques must be adopted without specifying the overall outcome.
- Product Standards: Define the characteristics of potentially polluting products.

These standards can support efforts to reach the goals of the Initial IMO GHG Strategy by directly decreasing ship emissions, thus indirectly making fossil fuels more expensive. They could have a positive effect on RD&D and stimulate the uptake of alternative fuels in a similar way to carbon pricing. By mandating certain outcomes, they can also bypass some of the market barriers and failures and guide investments in a way that avoids locking in infrastructural choices and stranding of assets.

One potential shortcoming of standards is they do not generate revenues, meaning that unless they are accompanied by an appropriate revenueraising and -use policy, they are restricted in their capacity to enable an equitable transition and address disproportionately negative impacts on States. Design elements, such as exemptions, differentiation in the standard's stringency and/or phased implementation of the standard, could be used. However, such design elements could have adverse consequences. For example, they would lower the environmental effectiveness of the standard, could (if applied on a route-level basis) create loopholes and lead to carbon leakage, but also result in exempted routes being serviced by increasingly old and inefficient ships which would leave countries serviced by those vessels behind on the technological trajectory.

National and Regional Policy Measures

While IMO mainly regulates international shipping, about 30% of GHG emissions from shipping stems from domestic shipping. Therefore, national and regional policy measures have the potential to contribute significantly to the reduction of ship emissions. Furthermore, the ambition of countries' Nationally Determined Contributions (NDC) should increase over time, so it can be expected that countries will look increasingly to sectors not previously considered in their NDCs. The IMO also recently adopted a resolution encouraging countries to develop voluntary National Action Plans to address GHG emissions from ships.

Engagement at a national and regional level could help create enabling environments for first movers, stimulate innovation and shield it from open market pressures initially before scaling it up over time. Zero-emission trade routes could be established between countries supporting each other to develop the necessary infrastructure, enabling zero-emission trading and a more collaborative and equitable transition. Countries with more capacities and resources could lead the decarbonisation of their national maritime sectors and domestic shipping through the development of dedicated policies and National Action Plans.

Portions of any national or regional revenue-generating policy measures could be used to support developing countries, LDCs, and SIDS as part of the equitable transition. Many countries are already taking widespread action at a national level which can inform and potentially complement the development of global IMO-driven policies.

Concluding Remarks

There are multiple potential policy options for closing the competitiveness gap between fossil and zero-emission fuels and enabling an effective and equitable transition. One potential route forward is the following policy package:

1. Adopt a global MBM capable of generating significant revenue. This mechanism needs to create a carbon price that incentivises emissions reductions and investments into readily available GHG mitigation options in the near term, and fuel switching once alternative zero emission fuels are widely available.

2. Combine an MBM with an effective and fair use of revenue recycling and other revenue use options to drive both demand and supply of zero-emission fuels whilst also supporting an equitable transition and addressing disproportionately negative impacts on States.

3. Use a direct command-and-control measure such as a fuel mandate in the long term to send an unequivocable signal to the market that a fuel transition will take place.

4. Develop national and regional policy that can ensure the transition of domestic fleets at least at the same rate or sooner than international fleets and that work in synergy with global IMO-driven policy.

5. Promote voluntary initiatives and information programmes to stimulate supply-side investments in RD&D and infrastructure, encourage knowledge sharing and support capacity development.

Shipping is an essential global industry which is currently on an emissions trajectory that is dramatically out of line with the Paris Agreement temperature goal. As such, there is an urgent need for the development of policies which guide and support this sector through an equitable transition towards zero emissions.

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

3D Scanning and Fusion 360 in Traditional Boat Building

Using modern day technology in traditional craftsmanship

3D capturing the hull of a boat with the EinScan H hybrid light 3D scanner

Daniel Lee at work

Daniel is scanning the full hull of the Stapley ski race boat in his workshop

The Cotswolds, a region of outstanding natural beauty located in the heart of the UK, is not where one might expect to find a boat builder. For Daniel Lee, building a boat is the ultimate woodworking project. Lines on a boat are very rarely straight. This adds a whole new dimension, challenge and beauty to the way of forming a boat, he says.

At the Intersection of Craftsmanship and Technology

Boats and wood have both been Daniel´s passions since a very young age. He loves the combination where the two meet. His favourite are vintage race boats and runabouts from the pre-war era. He believes the 'golden age' of boating dates back to a time when quality and style in wooden boat building were at their peak. The advancement of technology, modern construction methods, design and how this brings constant change to boat building fascinate Daniel.

His father and grandfather have always 'played with boats' and wood, so wooden boat building was a natural path of interest for Daniel to end up following. For many years he wanted to get into boat building full time. He has now taken the step into this adventure at the intersection of handcrafting and high-tech equipment.

From Scanning to Manufacturing: Authentic Digital Restoration and Replication with the EinScan H and Fusion 360

1 3D scanning with the EinScan H

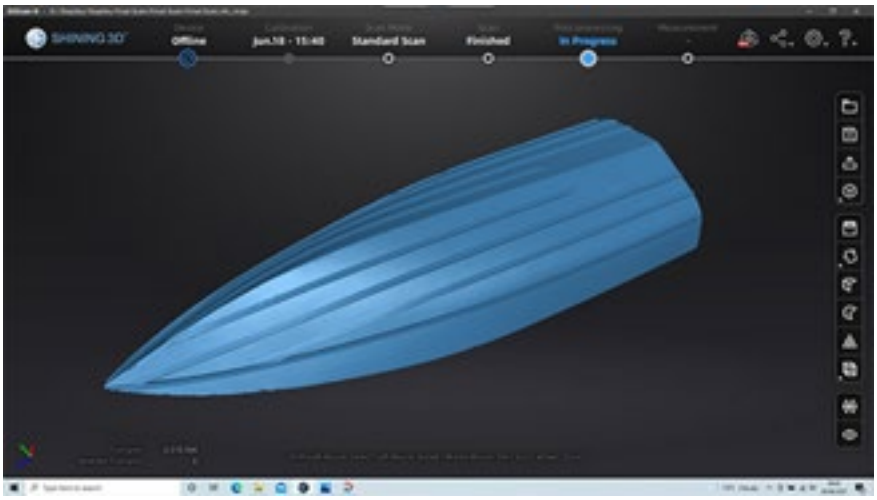
Currently, Daniel is working on the restoration of a Stapley ski race boat. He is using the EinScan H Hybrid Light 3D Scanner to digitally capture the entire hull.

As the EinScan H is a very efficient, user friendly and at the same time accessible device, it is the perfect tool for Daniel´s boat-building business. Getting started 3D scanning with the EinScan H is smooth and easy, also in technically demanding environments. It is light and flexible, so even getting it set up in a workshop and manoeuvring it around huge objects for surface capturing is a simple task.

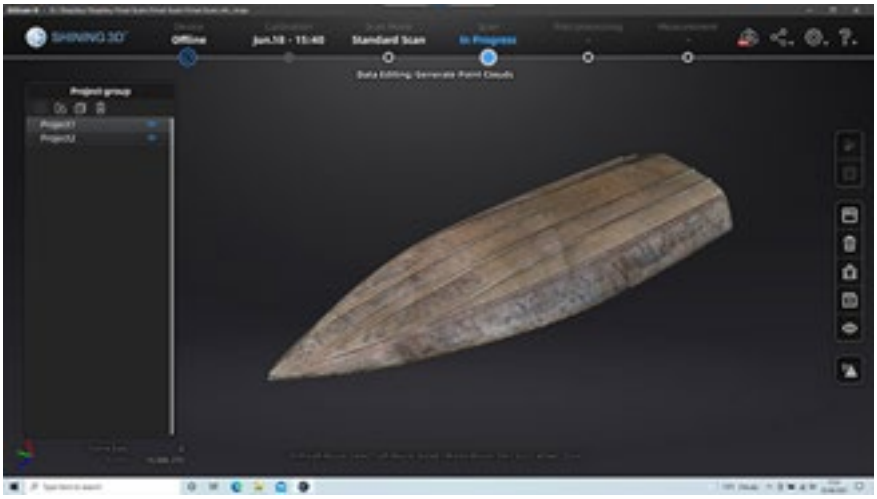
3D scanning with the EinScan H creates an authentic digital image of the boat hull in the EXScan software. The boat was scanned on a medium detail level to an accuracy of 1mm.

2 Reverse Engineering in Fusion 360

In the further process, alongside the restoration of the boat, Daniel is using Fusion 360 to reverse engineer

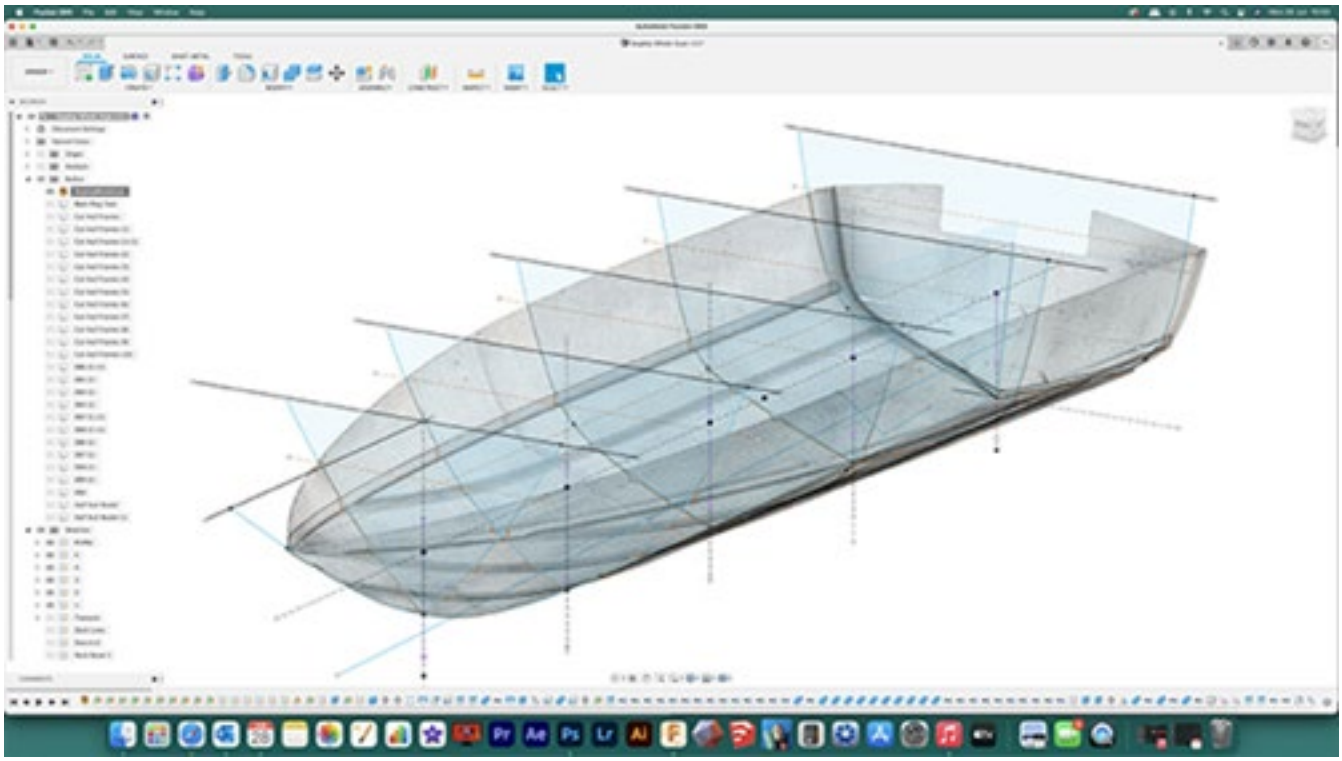


Stapley ski race boat full hull in the EXScan software



Boat hull with original colour features in EXScan software

Creating equally spaced cross-sections in Fusion 360



the scanning data to create mould sets. With this information, he is able to roughly calculate the costs of replicating the Stapley ski race boat with modern construction technologies and materials.

Placement of some equally spaced cross sections or "stations" in order to create the new hull. Combined with a cross-section of the keel, these are used to loft new skins for the boat.

Rough drawing of the new hull, deck and transom components. At this point, the hull isn't faired but the shape is close enough to be able to obtain material quantities for producing a new boat.

Drawing of an approximate layout of the mould. The original boats contain 6 layers of mahogany veneer, laid in opposing diagonal directions over a mould to form a rigid shell. This mould can be made from CNC cut sheets of MDF that will slot together in an egg crate style assembly.

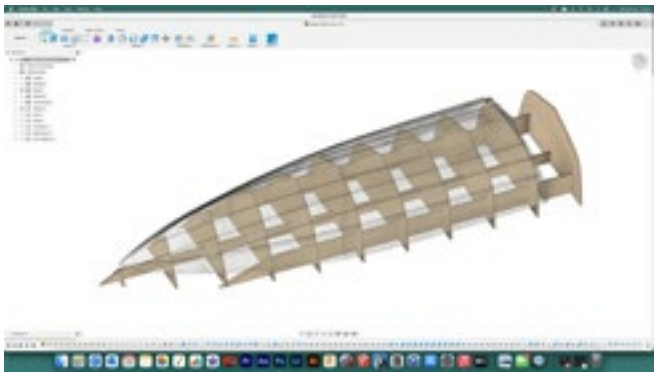
The mould is then skinned with wood battens which would be faired and used to build up the layers of veneer. The outer surface of this mould needs to match the inner shape of the hull.

The last step is the comparison of the scan data to the newly lofted hull skin and transom.

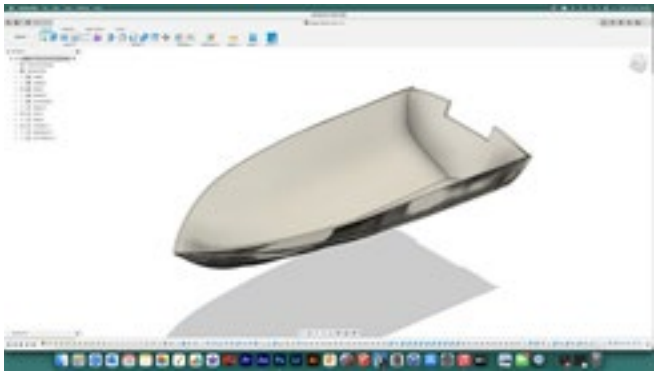
Daniel drew the data up in around 2 hours for the purposes of working out some rough pricing for what a replica of the boat might cost to build. If prices seem feasible Daniel can start to draw the boat up in more detail and do some refinements.

Sketch of the new hull

Drawing the layout for a mould



Design of the hull



Data comparison

All images in this article are courtesy of Daniel Lee at Dan Lee Boatbuilding.

For more information on Daniel and his work with the EinScan H visit **www.danleeboatbuilding.co.uk**

AND THE BAND PLAYED ON...

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

The verdict is now out, and the sentence issued in the Wakashio incident. The events do not make for comfortable reading; "closing the coast to get a Wi-Fi signal", "lookout released to attend a birthday party", master admitting to drinking "moderately", another pristine island's coastline damaged by pollution and the total loss of a ship. An incident that has cast shame on our industry.

I am surprised not to read more articles in the (non-maritime) press asking how is this possible. It is 10 years ago where I first publicly raised this in an article published in Lloyds List. In the article I stated that the number of navigational incidents appeared to continue unabated despite all the technological and training advances. I felt that something was missing and that the "big one" was about to happen. Well, it did, and it only took 8 days before Costa Concordia struck the rocks.

I felt the way forward was to adopt navigational audits to be undertaken whilst ships were underway at sea and I have continued to promote this concept at S4S conferences and magazine articles. In the same article I singled out the tanker sector as the only one promoting the concept of navigational audits; OCIMF through TMSA. I said that this should be extended to other sectors of our industry as the dangers - collisions and groundings are not unique only to tankers.

As we see, the majority of the recent incidents involve non tankers which may be proof positive of the beneficial effect such focus is having. Not only does the tanker sector promote navigational audits but they also publish Best Practice Guidance on how they should be conducted and also recent articles on the Effective use of ECDIS. Intertanko joins this safe navigation thrust with their own publications on safe navigation.

The Nautical Institute has been involved in the promotion of Navigational Audits through their publication Navigation Assessments. Recognising that any auditor, inspector or assessor needs to be properly trained they also established a Navigation assessor training and examination programme.

At present such audits are voluntary, although most tanker owners recognise that charterers of their vessels will be looking for confirmation these are in fact being conducted. So what about charterers of other tonnage? Do you confirm that the ships you are employing will be navigated safely? If you think the ISM Safety Management Certificate is a guarantee of safe navigation, think again; after all Costa Concordia and Wakashio had these certificates.

Finally, there is a disturbing trend and one that I would call the "wild card" or rogue behaviour. That is where well qualified and trained people decide to take actions which are unprofessional and go against all known standards. Even for an experienced auditor, this behaviour may not be apparent during their time spent onboard ship.

There is however a very simple solution; the equipment and instrumentation already exists onboard to identify if this behaviour is taking place. The question is however, who is ready to put this into practice?

WAKASHIO

INCIDENT TIMELINE

25 July 2021
Wakashio ran aground on a coral reef but did not immediately begin leaking oil.
6 August 2021
Oil began to leak from the ship by which time Mauritius authorities were trying to control the spill and minimize its effects. They isolated environmentally sensitive areas of the coast while waiting for help from foreign countries to pump out an estimated 3,890 tons of very low sulphur-fuel oil.
10 August 2021
About 1,000 metric tons of fuel had spilled, with estimates of the remaining oil onboard ranging from 2,500 to 3,000 metric tons. High winds and 5 metres (16 ft) waves halted clean-up efforts. Visible cracks in the hull of the ship led to worries that the ship might "break in two," according to Mauritius' prime minister, Pravind Kumar Jugnauth. Jugnauth said that 3,000 tons of oil had been pumped out of the ship's fuel reservoirs.
11 August 2021
Data from Finnish Iceye satellites indicated the spill had increased 27 km2 (10 sq mi) from the initial f3.3 km2 (1.3 sq mi) on 6 August.
15 August 2021
The ship broke up when there were still 166 tons of fuel inside. Waves 4.5 metres (15 ft) high hindered clean-up.
24 August 2021
After she split, Wakashio's bow section was towed into the open ocean and scuttled on. Recovery operations continued around the stern section, which remained aground.
31 August 2021
A tugboat working on the wreck sank after colliding with a barge in heavy weather, killing at least three crewmembers.
October 2021
A salvage contract for the remaining stern section of Wakashio, still grounded on the reef, was awarded to Lianyungang Dali Underwater Engineering of China to begin deconstruction.

Source: Wikipedia

About the author:
Capt Mark Bull FNI commenced his career in 1970 as a cadet with P&O S.N. Co. He subsequently spent the next 27 years at sea. On coming ashore, he qualified as an ISM and ISO lead auditor and joined a large ship management company becoming the QM/DPA over time. Mark then moved to London where he became the Loss Prevention Manager of an IG P&I Club. Since 2012, he has been an independent consultant having started his own company.

The Web is for Everyone: Identity and The Trusted Web (Part 1)

By Nick Parkyn

The Web or World Wide Web (WWW), commonly known as the **Web**, is an information system where documents and other web resources are accessible over the **Internet** (a global system of interconnected computer networks).

Tim Berners-Lee who invented the world wide web in 1989, said he was disappointed with the current state of the internet, following scandals over the abuse of personal data and the use of social media to spread hate. In 2009, he wrote:

I said, *"The web as I envisaged it, we have not seen yet."* That was because people were using the web just for documents, not for the data of a big web-wide computer. Since then, we have seen a wave of open data, but not of read-write data. For example, much open government data is produced through a one-way pipeline, so we can only view it. It should become a read-write web where users can interact and innovate, collaborate, and share.

Meanwhile though, there is a wave of concern, and related energy, desperate for change. People want to have a web they can trust. People want apps that help them do what they want and need to do - without spying on them. Apps that don't have an ulterior motive of distracting them with propositions to buy this or that. People will pay for this kind of quality and assurance.

People want to have a web they can trust.
— Tim Berners-Lee

The web is for everyone!

More recently he wrote:

I've always believed the web is for everyone. That's why I and others fight fiercely to protect it. The changes we've managed to bring have created a better and more connected world. But for all the good we've achieved; the web has evolved into an engine of inequity and division; swayed by powerful forces who use it for their own agendas.

The Internet was built without an identity layer.
— Kim Cameron, Chief Architecture of Identity, Microsoft

Since the Internet was built without an identity layer, it was built with no way of knowing who and what you are connecting to / communicating with. This has created limitations regarding what we can do with the Internet and exposes us to significant dangers of various forms.

Today, I believe we've reached a critical tipping point, and that powerful change for the better is possible - and necessary.
— Tim Berners-Lee

Evolution of Identity Models

Since the birth of the Internet, identity models have evolved to attempt to address the missing identity layer. They were driven by need, but unfortunately often by greed by companies with intent monetise your identity and other data.

The initial identity model was the Centralised Identity Model followed by evolution to other more creative models.

Centralised Identity Model / Account-based Identity Model

A centralised identity system is one where verified credentials such as national identity numbers, passports, identity cards, membership cards, loyalty cards, driving licenses, and social media logins and handles are stored and controlled by a single central authorities like online stores, service providers, governments, and social media companies.

The centralized model is also the original form of internet identity, that Tim Berners-Lee is unhappy with and is the model that in many cases, is still in use today.

You establish an identity by registering an account, (identified by a username / user id and password) with a website, service, or application.

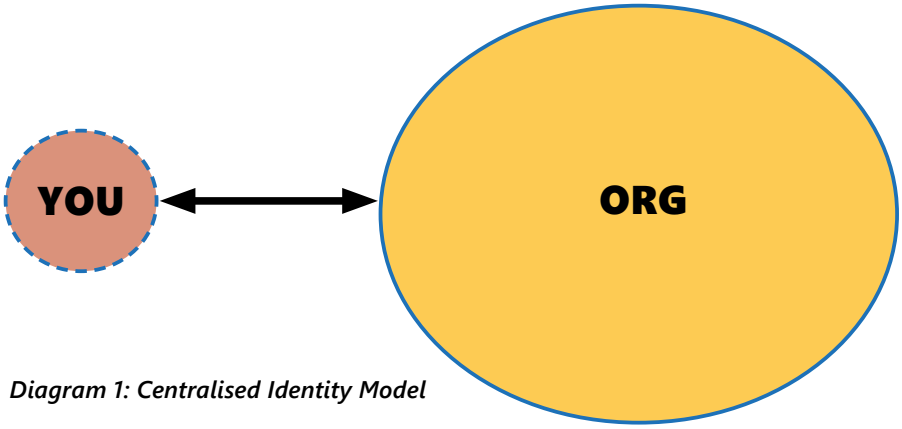


Diagram 1: Centralised Identity Model

In the world of centralized identity (Diagram 1), "You" are represented by the dashed circle, since the real "You" doesn't exist without an account being present in some centralized system. The real "You" is given permission to interact and transact with a website, service, or application because the Org is lending you credentials that represent "You" with limited controls and permissions. However, since the credentials are "loaned" to you the credentials belong to the Org.

If you delete all your accounts at these centralised providers:

- The "YOU" in Diagram 1 will completely disappear from the internet
- Your ability to access services will be disabled
- All the data about you will no longer be under your control
- All the data about you will belong to the Org.

This evolution was away from the undesirable initial centralised identity model and included:

- The Federated Identity Model
- The Decentralised Identity Model.

The Federated Identity Model

To evolve away from the limitations of the centralized identity model, the IT industry developed a new federated model, the Federated Identity Model.

The basic idea is a simple "man in the middle" approach: insert a service provider, the Identity Provider (IDP) in the middle.

Now you can just have one identity account with the IDP, and it, in turn, can log you in and share some basic identity data with any site, service, or app that uses that IDP. The collection of all the sites that use the same IDP (or group of IDPs) is called a *federation*. Within a federation, each of the Orgs is often called a *relying party* (RP).

Three generations of federated identity protocols have been developed since 2005 and they have been successful and beneficial.

Federated identity management (FIM) also started to catch on in the consumer internet, where was referred to as *user-centric identity.* Using protocols like OpenID Connect, *social login* buttons from Facebook, Google, Twitter, LinkedIn, etc. are now a standard feature on many consumer-facing websites (Diagram 2).

Despite all the work that has gone into federated identity since 2005, it has not really delivered on the requirement to provide us with the internet's missing identity layer.

The Decentralized Identity Model

A new approach FIDO (Fast IDentification Online) which was inspired by blockchain encryption technology, emerged in 2015. FIDO and FIDO2 (released in 2018) are based on free and open standards and supported / managed by the FIDO Alliance. FIDO2 reflects the industry's answer to the global password problem and addresses all the issues of traditional authentication.

The FIDO / FIDO2 approach does not rely on centralized or federated identity providers as is fundamentally a decentralized solution (Diagram 3).

The core ideas driving FIDO are:

1. Ease of use
2. Privacy and security
3. Standardization.

FIDO was rapidly adopted, driving new developments in cryptography, distributed databases, and decentralized networks.

The Decentralised Identity Model drove the development of new decentralized identity standards including:

- Decentralized Identifiers (DIDs)
- Verifiable Credentials (VCs)

Which are managed and controlled by the W3C Credentials Community Group.

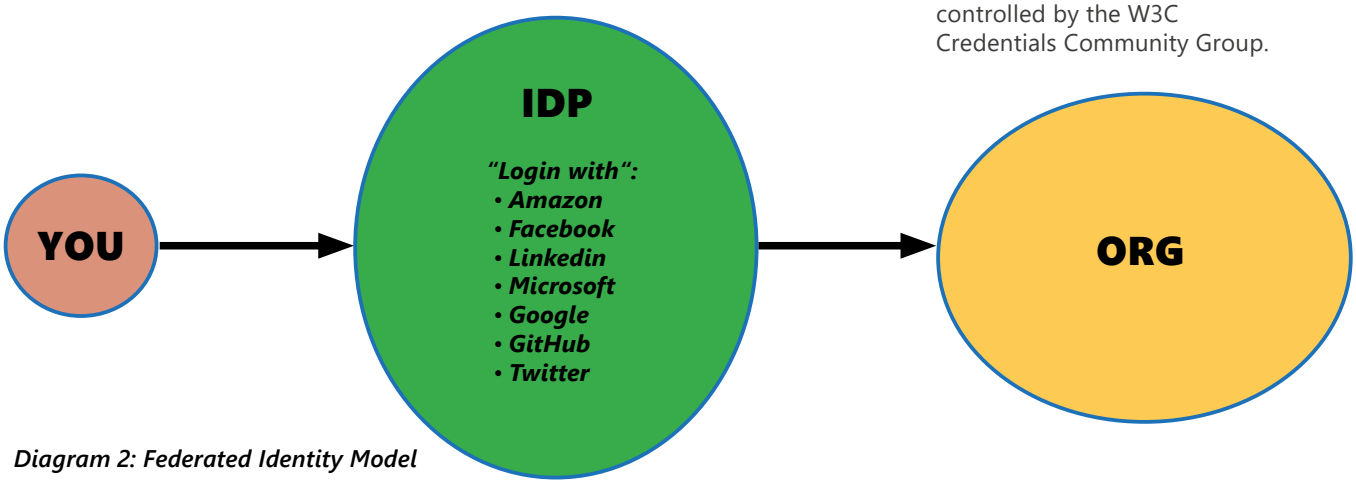


Diagram 2: Federated Identity Model

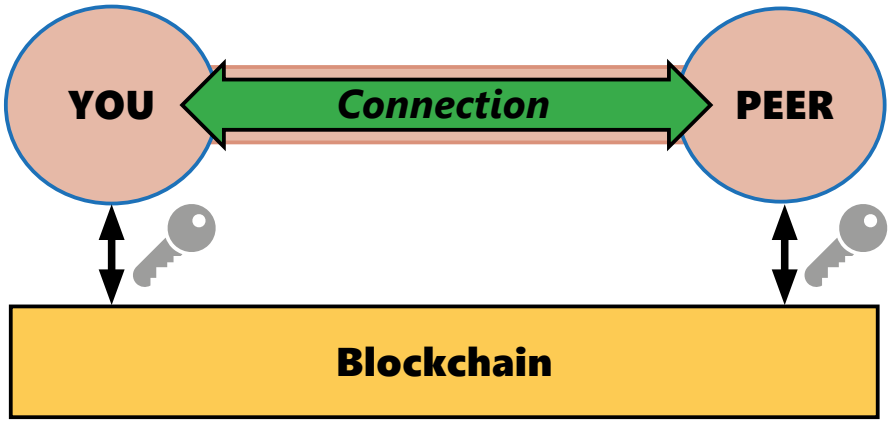


Diagram 3: Decentralised Identity Model

The Decentralized Identity Model operates like identity does in the real world and is not account-based. The Decentralised Identity Model is based on a direct peer to peer relationship between you and another party. Whether any party is a person, an organization, or a thing, neither of parties "owns", "controls" or "provides" the relationship.

Today all the above identity models are still used.

Self-Sovereign Identity

Existing identity management models are not fit for the future. The existing digital identity management models rely on centralized data repositories and centralized identity providers. The proliferation of digital services has positioned digital identity in the forefront and as a result the user (identity holder) has lost control of their data or been forced to relinquish control of their data "in exchange for" the use of social media and other applications.

A report "Value of Our Digital Identity" by The Boston Consulting Group *found that most consumers are concerned about how their personal data are used: 88 percent consider at least one industry to be a threat to their privacy when they are online. But far fewer (30 percent) have a relatively comprehensive understanding of which sectors are collecting and using their information. And fewer still are in control of their digital identity; just 10 percent of respondents have ever taken six or more out of eight common privacy-protecting measures, such as changing their privacy settings in a social network or opting out of certain data uses.*

The concept behind self-sovereign identity is the ability for the users (identity holders) to exercise better control, finer grain control and portability over their identity data.

Lack of adequate data ownership and control over digital identity data and the granularity of access by users, has had significant impact on users' privacy rights. As an example, your passport in a coarse grain identity document, which presents several different pieces of your identity information including your name, your nationality, your date of birth, your place of birth, passport number and an image of yourself. If an hotel requests to see our passport, what is the minimum amount of identity information they actually require for what they need to validate? Do they need to validate your personal identity (name, and image)? Then only name and image are required, however you have provided more identity related information to them than they need or are entitled to, including date of birth, place of birth, nationality, passport number. What might they do with this additional identity related information and how might they monetise it for their personal gain? You should have been able to provide them with only the identity information that they require.

Currently, fine grain control of your data is important but is in many cases not possible!

The retention of users' identity data on multiple centralized repositories, with diverse and often inadequate implementations of data security, data privacy standards and data management practices, have created compelling targets for hackers and cyber criminals, resulting in the escalation of security breaches and identity fraud.

There is positive change:

- Privacy laws and protection initiatives like GDPR (General Data Protection Regulation) legal framework have been mandated in many countries
- The Zero Trust Security Model ("never trust, always verify") is gaining widespread usage
- The Self-Sovereign Identity (SSI) movement which is influencing change
- Applications enabling Digital Wallet and Digital Vault technology are emerging.

SSI is a fundamental paradigm shift for digital identity.

Self-Sovereign Identity (SSI) is a new model for digital identity on the internet: i.e., how we prove who we are to the websites, services, and apps with which we need to establish trusted relationships to access or protect private information. SSI is enabled by new technologies and standards in cryptography, smartphones distributed networks and cloud computing.

However, SSI enabled by the Decentralised Identity Model is a fundamental paradigm shift for digital identity.

In summary: Self-Sovereign Identity infers that a person's identity that is neither dependent on nor subjected to any other power or state. Self-Sovereign Identity solutions are typically enabled by the Decentralised Identity Model.

In Part 2 of this article, we will further investigate this subject and explore how these, and associated technologies, will enable marine surveyors and organisations like the IIMS.

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Understanding the reasons for and the importance of accurately reading and reporting the HIN of a small craft

by Geoff Waddington, IIMS President

I am aware (and it is apparent) that even after 23 years in existence some marine surveyors still do not fully understand what a Hull Identification Number (HIN) is and how to interpret what is shows. Some Hull Identification Numbers are not being recorded accurately. One of the common mistakes made is recording the year of manufacture correctly. I cannot stress enough the importance of the correct recording being made of a vessel's particulars.

There are several very important pieces of information.

For small craft surveyors it is a basic requirement within a survey that the vessel's Hull Identification Number (HIN), or Craft Identification Number (CIN) and even a Watercraft Identification Number (WIN), is accurately recorded.

A vessel's identification number is basically the same as a VIN (Vehicle Identification number). All cars and light commercial vehicles built after 1981 should have a unique 17-character number, which provides access to valuable information about that vehicle's history.

A vessel's Hull Identification Number provides a 14-character unique vessel identifier code this identifies the country of origin, the builder, the model and, of course, records the year of manufacture. The importance of recording this information on the vessel's registration, title documents and all the vessel's documentation cannot be overstated. My advice is always check the vessel's paperwork, if available, to ensure that the correct numbers are recorded.

The small craft Hull Identification Number is defined in the CE RCD/ Recreational Craft Directive and was applied to all craft moulded in 1998, in addition to some in preparation for the impending legislation (June 16th 1998), which may have had Hull Identification Numbers applied as early as 1997 and even 1996.

The format of a Hull Identification Number is required to be in accordance with ISO 10087.95 as follows:

GB – GBB Y3101 J 3 04

GB (Country Code)

GBB (Builder's Identification Code)

Y3101 (Model Y3 and serial number of the boat 101)

J (Month of Manufacture) (October – Tenth letter of the Alphabet and Tenth month)

3 (Year of build 2003)

04 (Model Year 2004). Vessels built after June of one year are often built to next year's design.

You may possibly find some interesting numbers, such as GB-GBB Y3101 J 0 98 which refers to a vessel built in 2000 to a 1998 design.

According to the ISO (the following extract text in italics is a quotation)

"the HIN shall be carved, burned, embossed, moulded or otherwise permanently affixed, so that alteration, removal, or replacement will be obvious. If on a plate, the plate shall be fastened-excluding screwing or riveting as sole means of fastening so that removal will cause scarring to the surrounding area."

"The CIN shall be visible on the starboard outboard side of the transom, or near the stern within 50 mm of the transom top, gunwale, hull/deck joint or its capping, whichever is lowest.

- *5.3.1 On craft with a transom, the CIN shall be located on the starboard side of the transom.*
- *5.3.2 On craft without a transom or with a transom on which it is impractical to locate the CIN, the CIN shall be affixed within 300 mm of the stern.*
- *5.3.3 On catamarans the CIN shall be located as follows.*
- *Hulls structurally permanently connected: on the starboard hull.*
- *Hulls detachable but regarded as the primary structure: on both hulls.*
- *Hulls readily removable and/ or replaceable: on the aft cross-beam within 300 mm of the starboard hull; this also applies to catamaran-type pontoon boats.*
- *5.3.4 On trimarans the CIN shall be located on the centre hull in accordance with 5.3.1 or 5.3.2.*

The CIN shall be affixed to the craft during the construction or assembly of the craft. In no case shall the craft be put on the market without the CIN being affixed."

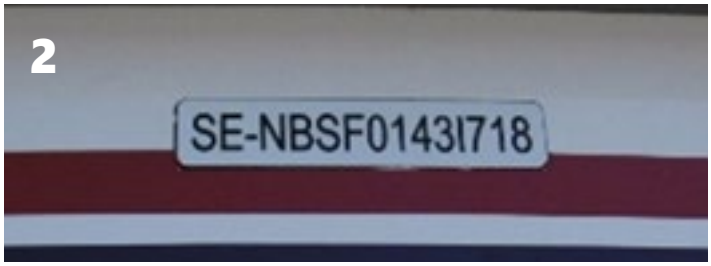


Photo 1 is a typical etched hull number starboard aft top of the topside by 'Jeanneau' - (this type is very easy to accidentally or intentionally polish out). Photo 2 a fixed plate type, by Nimbus, clearly showing the vessel as built in 2017.

The ISO also states that: *"A duplicate CIN shall be affixed to a non-removable part of the craft in a hidden location only known by the manufacturer. The duplicate CIN shall be located in the interior or beneath a fitting or item of hardware. Catamarans shall have this hidden CIN in or on both hulls. The CIN should be located so that it is extremely difficult to reach and modify".*

From experience different manufacturers have different locations, so if the surveyor doesn't know from previous experience, he/she can always request clarity from the manufacturer.

Aside from Hull Identification Numbers there is also a requirement for vessels built after June 16th 1998 to also have a permanently affixed Builder's Plate (CE plate). Extracted from ISO 14945:

"The builder's plate shall be readily visible, preferably in the cockpit or near the main steering position. In any case, the builder's plate shall be separate from the hull identification number".

There are certain minimum requirements, but manufacturers are allowed to include additional information if they wish, as you be seen from the above photographs. Be aware of the maximum loading and, if shown, the maximum power, both of which can sometimes be exceeded.

In addition to the Hull Identification Number, the Builders' Certificates can also show the original engine and gearbox numbers which can also give the surveyor good information to determine whether engines and/or gear boxes have been replaced.

In addition to all of this a CE Compliant Vessel is required to fulfil the essential requirements. Should a vessel be found not to have the required Hull Identification Number, or CE plate fixed to the structure, there should also be manufacturer supplied documentation which will contain vital information which could demonstrate that the vessel was compliant, and therefore the Hull Identification Number and CE plate could be reinstated. This information includes a Builder's Certificate, a Certificate of Conformity a documentary copy of the CE Plate with the category, maximum loading and so on. All this and more should be contained within the Owner's Manual, the existence of which is also a requirement of CE conformity.

If a boat is thought not to be CE compliant, it could be that it is not required to be as there are vessels which may have been exempt from the Directive. These are:

(a) craft intended solely for racing, including rowing racing boats and training rowing boats labelled as such by the manufacturer'

(b) canoes and kayaks, gondolas and pedalos;

(c) sailing surfboards;

(d) powered surfboards, personal watercraft and other similar powered craft;

(e) original, and individual replicas of, historical craft designed before 1950, built predominantly with the original materials and labelled as such by the manufacturer;

(f) experimental craft, provided that they are not subsequently placed on the Community market;

(g) craft built for own use, provided that they are not subsequently placed on the Community market during a period of five years;

(h) craft specifically intended to be crewed and to carry passengers for commercial purposes, without prejudice to paragraph 2, in particular those defined in Directive 82/716/EEC of 4 October 1982 laying down technical requirements for inland waterway vessels (2), regardless of the number of passengers;

(i) submersibles;

(j) air cushion vehicles;

(k) hydrofoils.

As one would expect there are always some difficult to understand sections:

Chapter 1 Paragraph 1 of the Directive, for example:
Partly Completed Boats.
Often Inland Waterways Craft predominantly 'Narrowboats' are bought as a hull for fitting out by a private individual, in which case quoting the Directive, *"The Partly Completed Boat does not fulfil all the essential requirements of the directive and is deemed to be completed i.e. completely fulfil the essential requirements, by another party who will be regarded as the manufacturer".*

This means that the person completing the boat becomes responsible for ensuring that it satisfies the requirements of the Directive and must therefore ensure that all the *"when separate and installed"* components are assessed for conformity during construction and have the vessel assessed for 'Post Constructive Compliance' on completion. Therefore, these vessels are not exempt.

Kit built boats built using all the necessary components as supplied by the supplier of the Kit (ie the manufacturer), must be certified by the manufacturer on completion. Therefore, these are not exempt.

(g) Home built boats sold after the five-year limit. The issue here is that the purchaser of any such vessel must be aware that it may not have been built in accordance with any recognised standards. A good analogy is that you are buying a boat, as you may buy a car, that had been constructed in somebodies back garden using materials of unknown quality which the builder sourced himself. (Buyer beware) because it appears that these vessels are exempt.

During discussions regarding the question of compliance I have been told on several occasions that nobody has ever been prosecuted for selling a non-compliant vessel. This I cannot confirm myself; however, I would consider that if a person sold a non-compliant vessel which subsequently suffered a catastrophic failure, the person who first placed the vessel on the market or imported the vessel could find themselves liable.

According to the directive *"Placing on the market refers to each individual product which physically exists and is complete (except those specifically referred to (above) in the directive) and is covered by the directive, regardless of the time or place of manufacture and whether it was made as an individual unit or in series. The concept of placing on the market must be clearly distinguished from sale. Placing on the market relates to the physical availability of the product regardless of the legal aspects of the act of transfer (loan, gift, sale or hire. Thus, manufacturer's stock, wherever physically situated after the 16th June 1998, where no transfer has taken place (seed definition of "Making Available") will be required to comply with the requirements of the Directive when placed on the market."*

During survey a surveyor must satisfy themselves whether the vessel needs to be compliant or not and in addition that the vessel has been constructed correctly, that the systems and fitted equipment are to the ISO standards as required by the directive and should record these facts within the submitted survey report.

UK Coastguard celebrates

200 years of service

From its beginnings with coastal lookouts to today's hi-tech national network of coordination centres, from small localised beginnings to international players – one thing has stayed the same for two centuries – Her Majesty's Coastguard seeks to search, to rescue and to save.

Two hundred years of saving lives along the UK coast and at sea, as well as coordinating rescues for those in distress in international waters, is being marked this year as HM Coastguard celebrates its milestone anniversary.

It was on 15 January 1822, that HM Coastguard was formally brought into existence and has been working to keep people safe at the coast and sea ever since.

In honour of that actual birthday, coastguards across all four home nations are cast throwlines as a symbol of the service's dedication - past and present.

Throwlines, which form part of the lifesaving kit used by coastguard teams, will be cast into the seas around England, Scotland, Wales and Northern Ireland at 11am, with each team operating under the latest COVID-19 guidance for the local areas.

Over the past two centuries, HM Coastguard has gone from strength to strength. In 2022, coastguard

Modern day Coastguard at work

operations centres coordinate responses to emergency situations at the coast calling on 310 Coastguard Rescue Teams – made up of 3500 dedicated volunteers – and using 10 search and rescue helicopter bases.

Although the way in which we operate has changed beyond recognition in the last two centuries, HM Coastguard continues to look to the future. Innovation has always been a driver – whether it be pushing forward state of the art technology in the national network of maritime rescue coordination centres or leading the way in rope, water and mud techniques.

In December 2021 HM Coastguard began to implement its new updated search and rescue radio network which uses fibre technology. More than £175million has been invested to upgrade the Coastguard's national radio network across all 165 sites over the next two years. This will improve and future proof its communication infrastructure and ensure that it remains able to communicate and exchange data quickly and reliably in order to co-ordinate rescues and save lives.

The service continues to adapt to changes – in the last few years providing mutual aid and support during events and incidents to other emergency partners. During the pandemic, coastguards supported the NHS, attended the G7 and COP26 in 2021 and are called in to support during national emergencies including flooding or supplying water to stranded drivers.

HM Coastguard provides training to search and rescue authorities around the world and also shares knowledge on a mutual basis with others. A key player with the International Maritime Organization, HM Coastguard's input and insight around the obligations of SOLAS (The International Convention for the Safety of Life at Sea) is sought and valued.

The service is currently working hard to reduce its carbon footprint and is aiming to make its UK-wide fleet of vehicles electric wherever possible over the next five years.

Following trials, six electric vehicles have already been purchased, with 19 more currently being procured for use across the UK. Opportunities to electrify the fleet where operationally possible continue to be identified, with the trialling and integrating of electric models as they arrive on the market.

And with technology ever evolving, the service will continue to strive to be at the forefront of innovation to carry out its life-saving work.

Maritime Minister, Robert Courts said:

Congratulations HM Coastguard on their 200-year anniversary. I am immensely proud and humbled by the continued dedication and professionalism from the staff and volunteers which ensures everyone's safety on our shores and around our coast.

HM Coastguard is the backbone of our maritime sector and the nation is indebted to its incredible workforce which continues to deliver an exceptional service.

Claire Hughes, Director of HM Coastguard said:

When you look at how we started and where we are now, it's easy to celebrate the innovation and development that can be seen throughout the service. And yet, we are far more proud of the people, the volunteers and the staff who throughout two centuries have continued to strive to keep people safe at the coast and out at sea. We always have and always will respond to those in distress.

While this milestone is an opportunity for us to look back with pride on what we've achieved, we have always looked to the future, and I'm proud that we continue to look for ways in which to improve and save lives. I'm proud of the commitment, the dedication and selfless sacrifice and I'm proud of how the service has developed and continues to do so.

A short history of HM Coastguard...

Coastguard 'magic lantern' 1890

17th/18th century As soon as medieval taxes were charged on imports and exports, people begin smuggling. By 1743 the estimate is that half the tea drunk in Britain was illegally imported. Smuggling is highly profitable, making local people live in fear, with violent reprisals on informers and the murder of revenue officers, while corruption enables smugglers to evade harsh penalties.

1790s Henry Greathead designs the first original lifeboat in South Shields. Twenty other locations place orders.

1808 A Captain Manby experiments with firing mortars to carry lines offshore to stricken ships. The "Elizabeth", 150 yards out at sea sees the first life save due to this method. Cots hung below safety lines soon follow.

1809 The Board of Customs forms the Preventative Water Guard to fight smugglers and this small force uses boats to patrol every bay and cove.

1816 The guard is placed under the Treasury. At each station the chief officer and chief boatman are experienced naval seamen or fishermen. In bad weather they form a shore patrol. Although created to end smuggling, the Preventative Water Guard quickly acquires extra duties and are instructed to take responsibility of shipwrecks to safeguard cargoes and vessels from looters. They are also trained with lifesaving equipment.

1821 The Preventative Water Guard is recognised as a major force against smuggling and it is recommended that it is again controlled by the Board of Customs. In a minute dated 15 January 1822, the Treasury accept the proposal noting the new force will be called 'Coast Guard' which is, in effect, the birth certificate of HM Coastguard.

15th Jan 1822 The Coastguard was formed in 1822 by the amalgamation of three services set up to prevent smuggling:

the Revenue Cruisers
the Riding Officers
the Preventive Water Guard

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 fusion hybrid antifoul from Hempel

Hempaspeed TF uses new, patent-pending technology combines traditional tough thin-film coatings with Hempel's patented hydrogel fouling release technology, creating a fusion hybrid antifouling that is biocide-free. The product combines the qualities of a robust hard antifouling with an ultra-smooth finish. It is suitable for use in both salt and fresh waters and has been developed to minimise growth and drag, to be easy to clean even with high pressure washing, with no risk for run-off contamination. It is suitable for all sailing boats including racing and trailer boats.

"The aim is for our product solutions to be more efficient and effective, as well as respecting the environment, so we constantly work on developing new technologies to help make that happen," explained Tino Rikkert, Hempel's yacht director Europe. "The new Hempaspeed TF is a perfect addition to our biocide-free range and aligns with our strategic goal of being a trusted sustainable coating partner."

Pioneering anchor completes on-land trials

A new marine anchor solution has successfully completed on-land trials validating the technology and sealing approval for full-scale production and ocean deployment.

The UMACK (Universal Mooring, Anchor & Connectivity Kit) Project has developed a unique mooring and anchoring solution in a bid to supersede traditional 'gravity-based' and tubular monopile anchors – reducing CAPEX, installation and O&M (Operational & Maintenance) costs by more than 50%.

After undergoing rigorous field trials in northern Portugal, the novel technology is now rapidly advancing through full-scale production ahead of ocean deployment. The UMACK system will be integrated with wave energy developer, CorPower Ocean's first commercial-scale WEC (Wave Energy Converter), as a key part of the overall flagship HiWave-5 Ocean Demonstration Project.

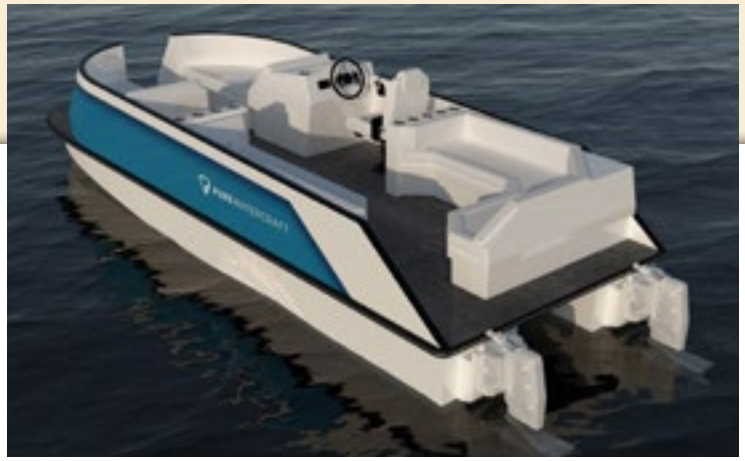
This recent field trial build upon previous successful stages of the anchor test programme at the world-class scaled anchor centrifuge testing facility at University of Dundee (UoD), and on-land testing at the world-renowned Fraunhofer Institute for Wind Energy System (IWES) in cooperation with the Test Centre for Support Structures (TTH) of the Leibniz University of Hannover.

World's first 'hybrid skimmer separator' comes to the UK

A Swedish tech developer with a clever new device with a pumping mechanism based on the human heart has partnered with a prominent UK environmental services company.

SurfCleaner's products are designed to separate and recover contaminants from the water surface – including oil, diesel, petrol, sludge and other pollutants. The company's hero product is its SCO 1000 machine which uses a world first dual skimmer separator technology.

The technology can be used across multiple sectors from industrial wastewater and municipal water-treatment to oil-spill clean-up and recovery. It also holds major potential for use across the maritime sector, covering harbours, coastlines and nearshore markets.



Pure Watercraft and General Motors launch first electric pontoon boat

Pure Watercraft, manufacturer of electric boats and propulsion systems, and General Motors has unveiled its all-electric pontoon boat at the CES exhibition and has opened pre-orders on its website. This is the first product to result from Pure Watercraft's collaboration with General Motors.

Pure Watercraft says its affordable luxury all-electric pontoon boat provides a new level of enjoyment, performance, and low maintenance to a segment that represents approximately 20 per cent of the US recreational boating market, growing more than 20 per cent annually.

Pure Watercraft's 7.5m pontoon boat, with top speed of up to 23mph, will have capacity for up to ten people, and is powered by single or twin Pure Outboard motors and a GM battery pack of up to 66kWh.

£75m marina redevelopment means green boat cleaning

Central to the new boatyard facilities at Dart Marina is a boat wash-down water recycling system from FiltaBund which ensures that no chemicals end up in the River Dart.

The wash down system, manufactured in the UK, operates a closed loop system so that all debris and water run-off is collected and put through a three-stage filtration system to be recycled for the next wash down.

The system is able to deal with copper, zinc, marine debris, silt and various proprietary additives contained in paint. It works by first removing large marine debris and paint flakes through bag filtration, followed by coagulation and settlement of free-floating particles.

Turkish firm launches yacht management software

Atlantis Global Management Information Systems S.A. of Turkey has launched a new yacht management software platform, FOMCS.com (Fleet Operation Management Control System), aimed at everyone from yacht owners, charter companies, yacht managers and brokers to yacht agencies and small to medium-sized enterprises (SMEs).

Founded in 2020 by Leonidas Tsiropoulos and Itir Ipekel Tsiropoulos, Atlantis Global's expertise is in producing software for the marine industry. "Many software packages are available with only one focus in the sector, but FOMCS was created with a single goal – all in one. And we achieved that," says Leonidas Tsiropoulos, whose background spans more than 30 years in the shipping and maritime industries.

FOMCS users can register and create an account online according to their current needs and can upgrade at any time. Some of the features include yacht administration and management, charter offers – option and bookings, yacht sales, yacht maintenance management, crew management and more.

NEW PRODUCTS

Yamaha targets small boat sector with new outboard launch

Yamaha Marine has announced four new variants of its popular F25 four-stroke outboard in a clear bid to capture a greater share of the tender and small fishing boat markets. The company unveiled a pair of F25 models with 15-inch shaft lengths and power trim and tilt functionality, along with two additional models featuring a new factory-installed tiller handle.

"Yamaha's F25 won a coveted NMMA Innovation Award shortly after introduction," said Yamaha Marine Engine Systems new product introduction manager, David Meeler. "As the lightest 25 horsepower model available – two-stroke or four-stroke – it features the highest power-to-weight ratio in its class. With the addition of these new models, Yamaha adds more value and convenience to premium portable power."

Topcoat has a high pigment load

The Acrylic Topcoat X is the latest addition to the ALEXSEAL coatings portfolio. The product uses the latest acrylic resin technologies, developed for a faster application process in a wide variety of application conditions. The resin technology used in the new X series allows for a higher pigment load in the coating, for enhanced coverage per square foot and full hide in two coats with most colours.

ALEXSEAL has taken into consideration different application conditions around the world such as temperature, humidity, and dust, to develop the fast-drying product.

In formulating the X series, ALEXSEAL's laboratory technicians used a mixture of new and proven raw materials to produce a flexible binding matrix. The product can be applied by brush and roller. A roll additive can also be used such as non-skid and flattening additives.

It has high abrasion resistance that helps protect it from fender rub and scratching, and UV protection for a long-lasting finish.

A new AIS MOB has been launched to coincide with 20 years of FastFind Personal Locator Beacons

The FastFind brand now has RLS PLB and AIS MOB solutions with the launch of the FastFind CREW1 AIS MOB.

FastFind CREW1 will join the Seas of Solutions marine electronics portfolio alongside the RLS enabled FastFind Return Link PLB.

The semi-automatic FastFind CREW1 can be water or manually activated. It's submersible to 50m and has an extended 36 hour battery life and high-powered SOS strobe capability. When the beacon is activated in an emergency crew recovery situation, an alert message is transmitted to all AIS receivers and AIS enabled chart plotters within a four-mile radius.

An AIS SART alert icon marks the survivor's location, including GPS position, which becomes viewable when the chart plotter cursor is positioned over the icon. The FastFind CREW1 is supplied, as default, with a clip to attach the device to lifejacket strap and an alternative clip which can be attached to the lifejacket's oral tube.

Talking Facts – Part 1

Do we really know what facts are and why is it important to distinguish between facts and interpretation?

Dictionary definitions include:

"A noun - a thing that is known or proved to be true."

"Information used as evidence or as part of a report or news article."

"In law the truth about events as opposed to interpretation."

The problem that we and others come across is that professionals are interpreting their findings and placing their interpretation in the findings section of their report instead of only stating their findings of fact. This can cause issues for their clients and equally so if there is a dispute regarding their findings and ultimate advice provided.

This short article will be one of three, the next will provide more technical examples for surveyors of fact versus interpretation, and in our final article we shall have some fun with the golden gate task to see if you can achieve the goal.

So, when writing a report for your client it is important to only state facts in the findings section of your report, not your interpretation of your findings of facts; and the summary section is what it says, a summary of the facts. The conclusion section of a report should be your conclusion drawn from the facts supported by the facts. Ultimately a third party will be reading your report and they need to read the facts, assimilate them, and decide if they agree with your conclusions and hence recommendations.

Now let's look at facts versus interpretation! Here are some simple light-hearted examples:

Interpretation: I was driving my car on the motorway, and I saw the car going very fast by my car so he must have been driving over the speed limit.
Versus
Fact: I was driving my car on the motorway, and I looked at my speedometer as the car was passing me and it showed I was driving at 70 miles per hour so he must have been driving over the speed limit to pass me.

Interpretation: He was very aggressive.
Versus
Fact: He was leaning into me with clenched fists repeating he would punch me.

Interpretation: It was cold when I got there early morning and I slipped when I got out of my car so it must have been icy.
Versus
Fact: I arrived at 7 am in the morning and I noticed the temperature gauge on my car showed minus 2, this was just before I opened the car door and put my foot down outside the car and I slipped.

The fact section provides evidence. If you need to draw evidence from external information you should say where you obtained the information and why you are relying on it as a fact. So, for example, if a renowned author has stated a fact in one of their articles or books that they can support in their writings and you refer to it, it may be for example regarding known time periods for certain metals to decay, then state the source and explain the eminence of the author. He may be a reputed metallurgist that is also frequently an expert witness.

My final message of the day is take care when writing reports. Use checklists, check headers and footers, and always leave the document for some time before the final reading of your report.

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A day in the life of...

Mick Uberti *AssocIIMS*

Mick Uberti will be known by some in Australia for his surveying work, but perhaps not by those elsewhere in the world. Over the past few years, Mick has helped to organise several IIMS events in the Australian region. Mike Schwarz tracked down Mick and posed a series of questions to him.

Question 1.
Pease tell me something about your working life before you came into the surveying profession.

I completed an apprenticeship as a mechanic and then worked at a Caterpillar dealer on a range of machinery from heavy mining equipment to on-highway trucks and generators. I then spent 8 years at sea as a marine engineer.

Question 2.
What was the attraction of marine surveying and how did you get a foothold in the industry?

I have always been interested in compliance and why maritime rules exist. While studying at Warsash in Southampton, UK, I applied for a job as a marine surveyor for the Victorian Department of Transport in Australia. I was fortunate enough to spend 8.5 years there which was a great learning experience and a great platform to start Maritime Survey Australia (MSA). I am one of the Directors at MSA along with Thom Magnuson, Isi Lyons and James Nolan.

Question 3.
The effects of the pandemic have challenged the role of the surveyor and, let's face it, none of us saw this coming. Australia has had its fair share of lockdowns and state border controls imposed. What have been the biggest challenges for you in your role as a surveyor and how have you had to adapt your working practices over the past 2 years?

Without drawing on all the negatives, a positive to come out of COVID is the acceptance from industry to complete more client meetings and training remotely.

As Australia has strict rules around international travel, this has made it impossible to complete physical inspections overseas, however we did see an uptake in more domestic work. We have had to engage with outside contractors more often than we would like. The biggest challenge has been keeping up with the constantly changing rules set by Local, State and Federal Governments.

Question 4.
There seem to be a number of amendments coming from AMSA in recent times. How can the Australian marine regulator best support the work of local surveyors?

The best thing AMSA can do is to have faith in the system they have put together. It is not perfect, but no system is. In many cases doing less would be doing more for surveyors.

Question 5.
What mechanisms do you use to help yourself to keep abreast of changes in the surveying profession to keep yourself current?

Every week MSA has a tech talk where we complete a presentation or a chat on compliance changes, or an interesting job that one of the surveyors is doing. This brings about discussion and learnings by the team, which is so valuable.

I subscribe to many industry magazines, including the IIMS and class societies which give regular updates. I also enjoy listening to webinars that are on offer from IIMS, Nautical Institute and Class societies.

Question 6.
What pieces of advice would you pass on to the next generation of marine surveyors?

Be a part of a team: It is so difficult keeping up to date and abreast of changes in compliance and technology. I have found that being part of a team enables you to learn more and be more productive and motivated towards client and company goals. Teamwork at MSA helps everyone to communicate better and come up with a solution to get the best outcome for the client. All this in turn leads to higher quality output. Being part of a team enables us to have a more flexible working arrangement.

Bring something to the team: Being a marine surveyor is a specialist role, so it is important to bring experiences from being an engineer, naval architect, shipwright, master or equivalent to draw upon as the role is so broad.

Question 7.
How do you see the surveying profession changing in the next 20 years in Australia and do you think it will still be an attractive second career option?

I think the part time approach that many enter the industry with is slowly diminishing, as clients are demanding and there is an expectation that you are always available and knowledgeable. Also, more naval architects in Australia are choosing surveying as a career option. One of the reasons for this may be because of the AMSA accreditation process is more suited to being a naval architect.

Question 8.
What do you most like about your role as a marine surveyors and which aspects of the job do you find most challenging?

Being one of the Directors at MSA, I enjoy the challenge of developing the business and enjoy meeting with clients and coming

Mick on board the PS Canberra

up with solutions. This can also be the most challenging when the solution may be an expensive one, or something that the client does not want to do. It's important to explore all options and get advice from the team.

The job can be very different from day to day, surveying a paddle steamer one day and the next day looking at a Sydney Ferry. The job has also taken me around the world, with clients from Thursday Island to Saudi Arabia. Jumping on and off planes isn't as much fun as it used to be, however visiting new places and cultures is still enjoyable.

Question 9.
What is the most important item in your toolbox and why?

Being part of the Maritime Survey Australia Team, without this I would be lost. Being able to solve a problem quickly by looking at our system online, or shooting a message out to the WhatsApp group makes the role a lot easier.

From a tech perspective, I always have my torch, phone and tablet with me as we are a paperless company.

Question 10.
How important is it to be part of a worldwide marine surveying professional body such as IIMS?

When I started MSA, I visited Mike and the team at Murrills House. They have a great network of surveyors who were willing to spend time with me and give valuable advice. I visited Damian Likely in Brittany and John Walker and John Excell in Palma Mallorca, who were all open and honest in sharing thoughts and advice. The IIMS provided a vehicle for me to learn from real professionals in their field.

IIMS have great courses and webinars that enable you to learn and become a better surveyor as a result. For marine surveyors that are not part of a team like MSA, it is essential that they are part of a good support network such as IIMS.

Question 11.
Please tell me a couple of interesting or unusual facts that most people would not know about you.

I once opened the batting for Corfu in a cricket match against Crete. I made one run and wasn't asked to go back!

I am also known to make a mean Pasta Amatriciana!

Question 12.
How do you like to relax when the surveying work is done for the day?

I enjoy spending time with family and friends. I enjoy cycling with a group most weekends, which is more about spending time with friends rather than the fitness.

I recently finished restoring a 1972 MGB with my father which has been a lot of fun. MG made these vehicles to ensure that their owners would always have something to fix, so that is also keeping me busy at the moment.

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