

THE REPORT

JUNE 2018
ISSUE 84

The Magazine of the International Institute of Marine Surveying



New REG Yacht Code

**METALS AND THEIR CORROSION
BEHAVIOUR IN SEAWATER**

**LIFECORD:
THE NEW 'SMART' KILL CORD**

THE FUTURE OF FUEL

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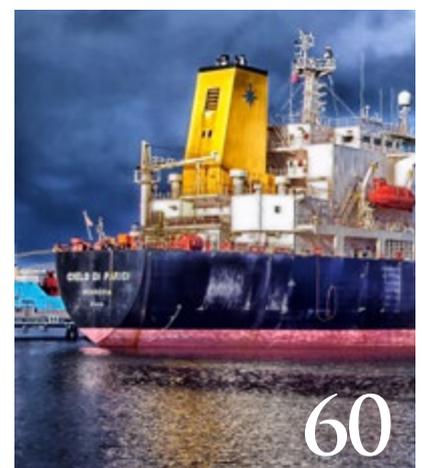
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EDITOR'S LETTER

Dear IIMS Member

We are mid-way through what is proving to be another hectic and challenging year. This issue of The Report Magazine provides a lot of valuable information and background to some important changes happening in the marine world, relevant to surveyors.

But as we approach the Annual General Meeting on 26th June by Heathrow Airport, London (being streamed live this year for the first time), let me start by reviewing the changing of our Presidential guard. After two years as your President, Adam Brancher will stand down to be replaced by President Elect, Capt Zarir Irani. I would like to take this opportunity to personally thank Adam on behalf of Institute members, the management board and myself for his work, guidance and friendship over that period. And as Adam continues to build his surveying business in Australia, I am sure he will look back fondly on his time in office. I am very much looking forward to working with Zarir and am sure our partnership over the next two years will be a positive and fruitful one.

The Institute does not give many Awards, but this year it has chosen

to recognise and acknowledge eleven Honorary Fellowships and Fellowships. Details of who has been recognised can be found on pages 30/31.

The new REG Large Yacht Code passed me by entirely. It was announced late last year and is set to come into force in January 2019. Not a completely new document as such, it takes the old documentation and brings it up to date, particularly relevant due to the changing nature of the over 24 metre yachts and superyachts that have proliferated in recent years. My request for a more detailed article on the new Code was welcomed and it is the lead feature article – see page 42.

Being a woman in a world that is dominated by male marine surveyors must surely be a challenge? Well you can find out. Many members will know the redoubtable Ursula Smith, based in Malta. It was a pleasure to seek out Ursula and to invite her to be the subject of this issue's 'A day in the life of' feature.

There is a large amount of members' news in this issue. Already this year, we have met over 200 members (and non-members) either real time, or online, at the various training

events we have held in the UK and overseas locations and this is certainly a growing part of what we do. Reports on the most recent events can be found in this issue. It is also sad to report the passing of Hugo Du Plessis HonMIIMS. Do read his obituary. He was quite a character and an early exponent of working with GRP.

Safety at sea remains a top priority. So, it is always pleasing to see an innovative organisation taking something that has been around a while and improving it. Kill cords are not new of course, but the development by Lifecord, which can only best be described as a 'smart' kill cord, is lifting this area of safety to a new level; and anything that prevents loss of life or serious injury at sea gets my vote. Read the article on page 50.

I am grateful to all the others who have contributed to this edition of The Report and I commend it to you.

Mike Schwarz
Chief Executive Officer
International Institute of Marine Surveying

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THE PRESIDENT'S COLUMN

Dear Member

Two years passes quickly. It doesn't seem like two months since the London conference where I took over the Presidency of IIMS from Capt Bertrand Apperry and spoke about my wish that the Institute would grow; and that it would actively encourage new entrants, including more women, into the profession. I think I also said something about not wanting to have to ever use the word 'President' and 'Trump' in the same sentence. Two of three achieved isn't bad I suppose.

It's been interesting seeing how various niches and sectors of the profession have fared during my time as President. There is no doubt that oil and gas has been on a continuing downward trend and those working in Class societies, as independent surveyors and inspectors, have seen their revenue markedly decrease. Those in super and other yachts in some parts of the world have been run off their feet, as have draft, cargo, P&I and H&M surveyors. The only constant has been change. Those who keep themselves current and are strategic about the sectors they target continue to prosper, whereas those stuck in a groove and who are

passive are more at the mercy of the market.

Markets do turn and time spent during lulls re-positioning oneself reaps rewards. The educational and other offerings the Institute has for members are really worth a look from that respect. There is truly nowhere else in the world with the amount of concentrated survey expertise and much of it is freely available via video downloads. A half hour a week exploring the rich content we have posted on YouTube, for example, is well worth the effort.

The last month or so has seen a lot of concentrated effort on the part of many senior IIMS members in dealing with a particularly unpleasant disciplinary matter that came to our attention. As President, I deal directly with complaints about the Institute itself, a reflection of just how seriously we take our stated policies and how important it is that the reputation of IIMS amongst the people we serve and the general public is second to none.

I would have liked to complete my tenure without having to exercise this rare function, but sadly that wasn't possible. Suffice to say

that the individual concerned is no longer an IIMS member as the collective wisdom of his peers was that this was the best outcome given the circumstances.

The bottom line is that members should have no concerns if they do their job diligently and competently. IIMS membership is valuable and in signing up we all agree to be bound by a set of rules and ethical standards. Only those who choose to tread a different path will come into contact with the disciplinary process.

So it is time for me to bow out as your President. I wish all the very best to my successor, Captain Zarir Irani. We are truly an International Institute with the presidency having leapt from Tasmania to Dubai. I'd like to personally thank the Board, the CEO and head office staff for their tireless dedication to our profession. The ship is on a good course and I look forward to the journey from here onwards.

Mr Adam Brancher *President*
International Institute of Marine Surveying
Email: adambrancher@kedge.com.au

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A word from your President elect

Dear Member

I look forward to shouldering the responsibility of the next two years as your President on behalf of IIMS. I feel fortunate to have been chosen as a capable candidate for this role and promise to use my best endeavours to uphold its legacy of 27 years and to make a difference during my tenure.

IIMS is a growing and thriving professional organisation that has, and will, require constant attention and also mentoring. Exactly like an efficient voyage requires in-depth passage planning taking into consideration all the no-go areas and the favorable currents and weather enroute, we promise to do exactly that. Plan, execute and measure results will be my approach, and like a good surveyor that reports back on what he or she does, I will do the same.

The vision is to take IIMS digitally to the forefront of what this profession demands and I repeat demands. It's not an option anymore and we need to think and operate digitally in a smarter way. We need to think how we can uplift our professionalism far and wide. Ship's, yachts and boats ply

the seas worldwide and we need professional surveyors in every major port and harbour around the world.

Although the shipping and boating industry, in particular surveying, is a very gender bias profession, this area needs some work in my view. Adam Brancher has initiated this campaign and I intend to take it forward.

The other area of focus is the age bias. Far too many of us professional surveyors are grey haired. While it's good to have experienced professionals amongst the membership, the focus on getting younger professionals to sign up as members and for the Professional Qualification Diploma program should and will be our concentrated effort.

We appreciate the fact that change is a permanent feature of our industry and every time our profession has come out of economic slumber, things have changed dramatically. While we don't know what those changes will be, we can all look into our regional crystal balls and try and anticipate these changes. If we accept this, we are automatically on the path of progress. This is what I personally believe and shall

endeavour to achieve during my tenure. If in the process I am able to leave with good memories, forge new alliances and make good friendships for IIMS, I shall consider to have given back a bit to this noble profession, which has given me and my family a lot to be thankful for and cherish over the years.

As your President elect, with the encouragement of a very supportive board of Directors and with their forward thinking and confidence, I am positive we can deliver results. With the support of Mike Schwarz at the wheel and an extremely efficient engine room (the IIMS head office staff) we shall grow in numbers, communicate effectively and flourish professionally.

Lastly, I would encourage IIMS members to write to me directly with their views, feedback and ideas by email to to Capt.irani@constellationms.com

President Elect
Captain Zarir Soli Irani, FIIMS
International Institute of Marine Surveying

IMO ADOPTS CLIMATE CHANGE STRATEGY FOR SHIPPING

Nations meeting at the United Nations International Maritime Organization (IMO) in London recently have adopted an initial strategy on the reduction of greenhouse gas emissions from ships, setting out a vision to reduce GHG emissions from international shipping and phase them out, as soon as possible in this century.

The vision confirms IMO's commitment to reducing GHG emissions from international shipping and, as a matter of urgency, to phasing them out as soon as possible.



More specifically, under the identified "levels of ambition", the initial strategy envisages for the first time a reduction in total GHG emissions from international shipping which, it says, should peak as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008, while, at the same time, pursuing efforts towards phasing them out entirely.

The strategy includes a specific reference to "a pathway of CO2 emissions reduction consistent with the Paris Agreement temperature goals".

The initial strategy was adopted by IMO's Marine Environment Protection Committee (MEPC), during its 72nd session at IMO Headquarters in London, United Kingdom. The meeting was attended by more than 100 IMO Member States.

IMO Secretary-General Kitack Lim said the adoption of the strategy was another successful illustration of the renowned IMO spirit of cooperation and would allow future IMO work on climate change to be rooted in a solid basis.

Full story:
<https://bit.ly/2HazWMQ>

ARE 'SMART BOLTS' THE THING OF THE FUTURE?

In the future, intelligent wireless bolts in wind turbines or satellites may be able to let the operator know when something is wrong. This could reduce the risk of human injuries and save cost.

A research team at NTNU in Gjøvik is working to create bolts that send an alert when something is not as it should be or when maintenance is needed. Each bolt must be able to contact a control center, which will receive messages from all intelligent bolts of this type in all installations around the world.

The team working on these wireless bolts includes Professor Michael Cheffena, two fellows and the manufacturer Dokka Fasteners. The vision of the research team is to develop wireless sensors to be installed inside the bolts. If the sensors detect that something is wrong with the bolts, they will send a message to the Dokka Control Center, which will then send a message to their customers. This makes it easier for operators to keep an eye on their equipment and prevent major accidents.



"Many structures like wind turbines, oil and gas installations are subjected to heavy loads. Today's manual methods for controlling and maintaining bolt loads are very time consuming and costly. So, therefore, developing an effective, common monitoring system is of technical importance," said Cheffena.



LATTICE TECHNOLOGY SECURES FIRST COMMERCIAL SALE OF ITS ON-BOARD LPV LNG FUEL TANK

LATTICE Technology's CEO Hoonjin Park confirmed on May 23rd that the company has secured the order for a 15m³ a lattice pressure vessel (LPV®) LNG fuel tank to be installed onboard a newbuild Port Cleaning Ship to assume service for the Ulsan Port Authority during 2019. The LPV® tank is a Type C-equivalent pressure vessel based on proprietary design by LATTICE Technology. This will be the first commercial contract for a LPV as well as the first LNG-fueled, public service vessel in South Korea.

The Port Cleaning Ship is the first project following the Korean government's recent assertion that it will actively boost eco-friendly LNG-fuelled shipping by ordering LNG-fuelled public service ships and supporting use of LNG-fueled, commercial ships. LATTICE Technology is proud to have been chosen to deliver its unique LPV LNG fuel tank for this project. This LPV is designed for 9 barg pressure and its shape is adapted to the specific ship structure; this implies that it provides 50 percent more capacity than that of a traditional, cylindrical pressure vessel.

LATTICE technology's proprietary LPV containment system for LNG has been approved by seven international classification societies following the successful test of four prototype tanks. Sunbo Industry will combine the LPV fuel tank with its LNG fuel supply system. The total system will be tested and certified by the Korean Register (KR) and delivered to Korea Shipyard in November of this year.

Dr. Pål Bergan, CTO, explains the many advantages of the technology; "The LPV employs a modular, internal lattice structure that enables a completely new type of pressure vessel with unique flexibility with regard to being fully scalable in all directions with a box-like shape. The design is easily adapted to a prescribed design pressure and the overall safety performance is superior to traditional cylindrical pressure vessels. Also, resulting from the internal structure, the fluid sloshing problem is eliminated by default".

Full story: <https://bit.ly/2GY68IG>

DENMARK CANCELS REGISTRATION FEE FOR DANISH REGISTER IN ATTEMPT TO BOOST FLEET SIZE

The Danish Parliament adopted a legislative amendment on 26 of April, which cancels the registration fee for vessels in the Danish Registers of Shipping. The aim of this amendment is to increase the attractiveness of the Danish Flag.

Denmark supports that this measure will indeed increase the attractiveness of the Danish Flag, as it now offers the same benefits as foreign Flags.

This amendment also provides increased economic activity and international influence, when the Danish Flag attracts more vessels from both national as foreign shipowners.

The amendment entered into force on the 1st of May 2018, but with a retroactive effect from the 1st of January 2018.

A refund of the registration fee is possible, provided that it has been paid during the period 1st of January 2018 to 30th of April 2018 and provided it exceeds an amount of 200 DKK.

All applications for repayment will be processed by SKAT. The deadline for applying for repayment of the registration fee is the 31st of July 2018.



BRITISH MARINE ISSUES STATEMENT FOLLOWING CANCELLATION OF 2019 LONDON BOAT SHOW

British Marine, which organises and owns the London Boat Show, has announced that the 2019 Show, due to run at ExCeL London from 9-13 January 2019, will not take place.

This decision was made after independent research by exhibition experts, Zing Insights, showed there was insufficient support from a large proportion of the marine industry to the London Boat Show with its current format, duration and location.

In the last three weeks, Zing Insights has carried out personal interviews with over 67% of exhibitors. This revealed that whilst a number of marine companies supported the change to a five day Show, finding it preferable to a 10 day Show, a large number of key exhibitors were not prepared to commit to exhibiting to a five day Show at ExCeL in January 2019.



Visitor research also showed that consumer satisfaction of the 2018 Show was below acceptable industry standards. Visitor satisfaction was centred on the content of the Show and specifically on the number and diversity of sailing and power boats exhibited. The research results showed a year-on-year decline in audience satisfaction which would continue to fall if the Show proceeded in the same format and continued to fail to satisfy visitor expectations.

Read the statement in full at <http://bit.ly/2kARCri>

DNV GL PUBLISHES ITS REVIEW OF MARINE FUEL ALTERNATIVES

Class society DNV GL has published an up-to-date assessment of the most promising alternative marine fuels available today. The study is timely, as the 2020 fuel sulfur cap is fast approaching and the IMO has just decided to aim for a 50 percent cut in shipping's carbon emissions.

The paper examines the prospects for the full range of alternatives – LNG, LPG, methanol, biofuel, hydrogen, fuel cells, wind and battery technologies – and it compares them to the use of conventional fuel, both with scrubbers and without. It is primarily aimed at helping shipowners understand their compliance options for the approaching sulfur cap, but it also includes a detailed breakdown of the carbon emissions profile of each fuel and propulsion technology.

Over the short term, the paper predicts that the vast majority of vessels in service today will either switch to low sulfur conventional fuels or install a scrubber system while continuing to use heavy fuel oil (HFO). DNV

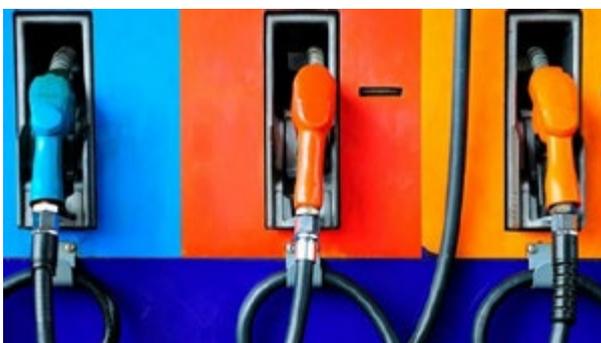


Image courtesy of DNV GL

GL notes that because of the limited availability of scrubber installations, at most about 4,000 vessels will be using the technology in 2020. This raises the question of whether the high-sulfur fuel that scrubber-equipped vessels are designed to consume will remain available, given the small size of the market.

DNV GL's compilation of the carbon profiles of fuel alternatives is particularly timely, as the industry is discussing its options in the wake of the MEPC's agreement on a CO2 reduction target.

Full story: <https://bit.ly/2qRRVSm>

CLASSNK PUBLISHES GUIDELINES FOR USE OF DRONES IN CLASS SURVEYS

Leading classification society ClassNK has released its Guidelines for Use of Drones in Class Surveys. These guidelines incorporate the applicable range and procedures for use of drones in class surveys, the technical considerations for safe operation and the requirements for drone service suppliers.

Because drone-related technologies are improving at an extremely rapid pace, application in diverse fields is increasingly expected. In the maritime industry as well, efforts aimed at utilization in the field of inspections and surveys are being carried out.



At the International Association of Classification Societies (IACS), discussions on the use of Remote Inspection Techniques (RIT) including drones in class surveys are already underway, and IACS Rec. 42 (Guidelines for Use of Remote Inspection Technics for Surveys) was revised in June of 2016. A revision of the related IACS Unified Requirements has also been completed and will take effect in January 2019.

On the other hand, when flying a drone in places such as the cargo hold or ballast tank of a ship, it is important to take into consideration the possibility that the drone may not function properly due to being in a closed space surrounded by magnetic material which may interfere with some of the sensors of the drone (GPS and magnetic compass) which are closely related to flight stability.

In regards to this situation, ClassNK established a R&D Roadmap in September 2017, which described efforts related to drones in the item "Survey Technology Innovation," one of its Four Focus Areas of R&D. In January 2017, the Society began a full-scale study of the use of drones in class surveys, and has conducted various types of verifications by carrying out basic performance experiments and experiments to test flight inside ship tanks and cargo holds.

Full story: <https://bit.ly/2l0pQme>



OYSTER IS SNAPPED UP BY RICHARD HADIDA YACHTING

UK software entrepreneur Richard Hadida has been confirmed as the new owner of Oyster. The deal – brokered by administrators KPMG – covers the assets and business of Oyster Marine Ltd and the assets of Oyster Marine Holdings Ltd, including its shareholdings in companies within the Oyster Group

The sale, to a new company, Richard Hadida Yachting, will secure the employment of the retained staff at Oyster's Southampton and Wroxham sites.

Mr Hadida has sailed an Oyster yacht for several years and says he has fallen in love with the yachts themselves, the events and the Oyster family. It was this passion that led to his decision to acquire the business.

"I firmly believe that we must save this prestigious British yacht builder and continue to nurture and grow the Oyster Group for the long term," he said.

"My investment in Oyster is not merely a hobby."

And he stated that Oyster needs to be a sustainable business with hard, quick decisions made. This could include the company adopting more modern construction techniques such as modular construction to reduce build times.

Full story: <https://bit.ly/2Fa5bpxl>

BOATCOSAFE LAUNCHES BOATING CARBON MONOXIDE ALARMS CAMPAIGN

Mandatory installation of Carbon Monoxide alarms on cabin boats in UK waterways would save lives. In the last 20 years, 19 boaters have died and another 24 have needed hospital attention from Carbon Monoxide gases.

BoatCOSafe has launched with a petition and news on its website see BoatCOSafe.uk along with an intense video highlighting the dangers. There is also an online petition available on the website to encourage parliament to make having a CO alarm mandatory on inland waterways.

“Boats are naturally enclosed spaces where Carbon Monoxide can build up very quickly – and as you can’t smell or see it, you can be affected by it before you realise what has happened,” says lead campaigner Niki Molnar MBE



Full story: <https://bit.ly/2pM5pxr>



UK MCA AND RNLI TEST DRONES FOR SEARCH AND RESCUE

The UK Maritime & Coastguard Agency (MCA) and the Royal National Lifeboat Institution (RNLI) have run a special week-long event to test the use of drones along a stretch of coastline at St Athan, Wales. The testing took place between 23 and 27 April. A selection of drones were used in four different search and rescue scenarios to explore how they could be used to help save lives in the future.

The scenarios were a shoreline search for a casualty, an offshore search for multiple casualties in the sea, a mud rescue and a communications blackspot where a drone is required to relay information between rescue teams and a casualty on a cliff.

Featuring RNLI lifeboats and an HM coastguard search and rescue helicopter, the scenarios explored evaluated the potential impact of using drones (or Unmanned Aerial Systems) on operations. Particular attention was given on how drones can work together with existing search and rescue teams and assets to enhance lifesaving capability and reduce risk to rescue teams.

Full story: <https://bit.ly/2rqFM7k>

INAUGURAL DUBAI SUPERYACHT SUMMIT SEES CHALLENGES FOR UAE AS A YACHTING DESTINATION

The first Dubai International Superyacht Summit saw global industry leaders come together to discuss the opportunities and challenges for the emergence of an “Emirati Riviera” as a superyacht hub and a winter yachting destination.

The summit led to local industry leaders and visitors almost unanimous in acknowledging the vast potential of the region to become a yachting destination and in stressing the improvements needed to realise this potential.

It was noted that to achieve its goals, massive on-going investment is required in infrastructure to allow for the development of the region. A revision of local regulations was also called for to simplify the movement of yachts in the region, and in meeting the needs of multinational superyacht crew intending to cruise in UAE waters.

Full story: <https://bit.ly/2HRMo5I>



MARITIME & COASTGUARD AGENCY CEO SIR ALAN MASSEY ANNOUNCES HIS RETIREMENT



After eight years in charge, the chief executive officer of the UK's Maritime & Coastguard Agency (MCA), Sir Alan Massey KBC CBE, has announced his intention to retire from the role towards the end of 2018.

Sir Alan joined the MCA in July 2010 after a 33-year career with the Royal Navy, where he left as second sea lord.

During his eight-year tenure, Sir Alan has successfully steered the MCA through changes to modernise Her Majesty's Coastguard, new arrangements for the UK's search and rescue helicopter

capability, a transformed survey and inspection capability and a more commercially responsive approach to how the UK Ship Register operates. Sir Alan will continue his role until late 2018, to allow the appointment process for a successor to take place.

Bernadette Kelly, permanent secretary of the Department of Transport, said, "I want to thank Sir Alan for his leadership of the MCA and his tireless commitment to improving safety at sea for all and supporting the UK's maritime interests.

Full story: <https://bit.ly/2uvqvG6>

ABS LAUNCHES DIGITAL E-CERTIFICATES

ABS has announced the launch of e-Certificates. Continuously available, tamper-proof, independently verifiable and secure digital equivalents of traditional ABS paper certificates, e-Certificates are now available to ABS' entire classed-fleet, subject to individual Flag Administrations' authorisation. Traditional paper certificates are always still available.

"E-Certificates are the latest product from ABS' FutureClass™ program. Defining the future of class focuses on the utilization of data and digital technology to deliver benefits for our clients," said ABS Chairman, President and CEO, Christopher J. Wiernicki. "ABS' e-Certificates are a perfect example of how we strive to add value and operating efficiencies for our customers."

Uniquely, ABS' e-Certificate system allows a simultaneous, vessel-wide view of all applicable certificates, rather than requiring the user to look up each certificate individually.

Fully compliant with IMO Guidelines, ABS e-Certificates will reduce administrative burdens, cut onboard clutter, and simplify port State, flag State and third-party validation. Digital protection, the unique tracking number and electronic signatures and endorsements of e-Certificates, are provided by Adobe ES4. Authenticity is independently confirmed via the ABS verification website.



Full story: <https://bit.ly/2FciE0o>

FUTURISTIC 110 METRE SUPERYACHT CONCEPT ELYON BY EXPLEO SET TO BREAK THE SUPERYACHT MOULD



Expleo Design has unveiled a futuristic 110-metre (360-foot) superyacht concept named Elyon, with on-board accommodation for up to 30 guests.

According to Expleo Design, the organic shapes of the yacht “combine elements inspired by nature [and] assembled in a futuristic and innovative approach”. The studio’s main inspiration was a calm ocean wave, which explains its curvaceous exterior lines, which are described as being calm and elegant, yet firm and strong at the same time.

Elyon’s unique bow; the blending between decks; wide-glass windows; and her structural elements are combined with clean design and wide-open spaces to give the feeling of space, freedom and power.

Key entertainment features are spread across six decks, and include a sunbathing area, swimming pool, Jacuzzi, spa, gym, wellness area, and a games and casino room.

The space underneath the helipad on the foredeck has been designed as a dedicated ‘party place’ with a front view and indoor swimming pool.

CAPT. JOHN LLOYD (CEO THE NAUTICAL INSTITUTE VISIT TO PAKISTAN MARCH, 2018)

Capt. John Lloyd CEO Nautical Institute visited Pakistan on March 13th, 14th and 15th during his stay in Pakistan he visited:

The Nautical Institute Pakistan branch to meet members. Various topics were discussed. A very interactive session was held.

Karachi Port Trust (KPT) and met Rear Admiral Jamil Akhtar (Chairman KPT) and Rear Admiral Asif Hameed AFNI (General Manager (Operation)).

Mercantile Marine Department of Pakistan



A half day presentation was given by Capt. John Lloyd at Bahria University on the Continuing Professional Development (CPD). About 100 participants attended including maritime experts, lecturers and professors, naval personnel, Merchant Navy officers, Nautical Institute’s members, government officials and students.

WET DAMAGE THE MOST COSTLY CLAIM FOR BULK CARRIERS SAYS THE SWEDISH CLUB

The Swedish Club has published a report warning bulk carrier owners to pay extra attention to the basics. The Club has concluded that for bulk carrier operators, wet damage is the most costly claim type and the second most common claim that they experience.

The report is entitled Wet Damage on Bulk Carriers and has been prepared in cooperation with DNV GL, and MacGregor. It identifies heavy weather and leaking hatch covers as the most common and the most costly type of wet damage claim and the average cost for a wet damage cargo claim being almost \$110,000.

Whilst weather routing minimises the effects of heavy weather, green sea on deck is surprising, and it is not unusual for cargo hatch covers to be fully immersed in sea water.

Wrongly applied and poorly maintained cargo hatch covers and sealing systems increase the risk of cargo becoming damaged by water. Case studies have shown that many of these claims can be avoided. However, hatch components in poor repair, and applications of tape and seal-foam proving aren't substitutes for good maintenance.

The most common wet cargo problems include leaking cross joints, and compression bars, rubber gaskets, hatch coamings, drain channels and cleats in poor condition.

Wet Damage on Bulk Carriers offers recommendations to avoid these pitfalls, simple checklists and explanations of the routine tasks that can be conducted as part of a vessel's PMS.

Click to read the 32 page report: <https://bit.ly/2jGO0sv>



STANDARD P&I CLUB ISSUES A GUIDE TO FIRE SAFETY ON FERRIES

A fire is one of the most frightening things that can happen at sea. Often, seafarers have no ready access to the emergency services when a fire breaks out and will need to rely on their own resources, courage and training to tackle and extinguish the blaze quickly to ensure the safety of the ship and everyone on board. To help Standard P&I Club has issued a guide to fire safety on ferries.

There are numerous causes of fire but the most relevant to ferries are:

- Electrical defects, such as overloaded electrical equipment, damaged cables and poorly formed connections. – Electrical faults in vehicles, especially when engines are hot/running. Reefer containers are major sources of fire.
- Mechanical failure, such as ignition from overheated bearings or a catastrophic engine failure.
- Uncontrolled release of oil or flammable liquid coming into contact with a hot surface, or the release of a low flashpoint fuel, such as petrol vapour, coming into contact with a source of ignition.
- Dry, readily combustible materials (such as wood, paper, textiles) coming into contact with an ignition source, such as a lighted cigarette, sparks or conducted heat from burning or cutting, highintensity lights or defective electrical equipment.

Click here to download the free 36 page guide: <https://bit.ly/213bCNn>

LONDON P&I CLUB REVEALS KEY CAUSES OF RECENT CONTAINER LOSS CLAIMS

A recent run of container loss claims by the London P&I Club has highlighted some of the common contributory factors that emerge as part of the investigation process. The Club noted that the subject of misdeclared container weights continues to be a problem. But with this particular run of claims it was the attending surveyor's observations about cargo securing equipment that caught the eye.

In these cases, it became clear that several manual twist locks were not correctly locked at the time of the incident. The causes for this were considered to be two-fold – some twist locks were damaged (specifically with locking levers either bent or missing), or the units in service were a mixture of right and left-hand locking units, leading to confusion over the observed status of the twist lock.

Upon investigation, a number of container corner castings and container foundations showed no signs of having a locked twist lock forcibly removed during the collapse, the natural conclusion being that the twist locks were in those cases in the unlocked position. It was also evident that in some cases the degree of wastage of deck/hatch container foundations was such that they were no longer serviceable. As a result, even the best maintained twist lock cannot properly contribute to the planned securing arrangement.

Owners are reminded of the need to ensure that container lashing and securing equipment (including fixed fittings) are included in the ship's planned maintenance system. It is further recommended that at the same time, the ship's equipment is all checked for consistency against the provisions of the ship's prescribed cargo securing equipment inventory within the cargo securing manual.



IMPROPER SECURING ARRANGEMENT OF SEA STRAINER COVER LEADS TO VESSEL CAPSIZING

Shipowners P&I Club has issued a case study about the capsizing of a vessel due to a loose port side sea strainer. Whilst double banked alongside another tug for four months awaiting a placement in dry dock, a harbour tug suddenly developed a list to port. Crew on board at the time quickly investigated to try and determine the point of water ingress, but struggled as the water level reached approximately 1 metre in height in the flooded engine room.

As the engine room crew tried to establish and stop the source of ingress, the deck crew were adjusting the mooring ropes to keep the vessel safely alongside as the vessel listed further to port. Eventually, the master took the decision to abandon the vessel as it was no longer safe to remain on board.

A salvage operation was completed, and upon investigation, the point of water ingress was identified as a loose port side sea strainer cover.

Fuel and other oils had been removed from the vessel in preparation for the upcoming dry docking, consequently, there was no pollution from the vessel.

The deck crew were able to release the mooring ropes from the neighbouring vessel prior to abandoning, avoiding additional damage.

No personal injuries resulted from the incident.

On the port side sea strainer, only one of the eight wing nuts was found to be in place and standard nuts had been used on the other seven bolts, therefore the securing arrangement had lost most of its integrity. The bolts were also found to be rusty and general condition of the sea strainer was poor.

Completion of tasks such as securing of the sea strainer covers should be suitably supervised by a competent person as required by company procedures and the relevant task risk assessment.

HOT WORK RESULTS IN A MELTDOWN

A ro-ro ferry was operating to a normal schedule with contractors on board to conduct repairs to an auxiliary boiler. The work was planned to start during an evening passage. The repairs involved hot work inside the boiler. Hot work and enclosed space entry permits to work (PTW) were completed by the chief engineer and accepted by both the safety officer and the ship's master. The safety officer stressed the importance of maintaining a fire watch as a number of fire detector heads in the engine room were going to be isolated for the duration of the hot work. The ferry sailed on schedule and work on the boiler was started as planned. On arrival at its destination port, discharge of passengers and vehicles commenced. The chief engineer then informed the safety officer that a small fire had occurred in the boiler about an hour earlier while the contractors were using flame-cutting equipment. Investigations revealed that a portable light unit, used earlier in the day, had been left at the bottom of the boiler and that sparks from the cutting process had caused the unit to ignite. The contractors had reacted quickly and had extinguished the fire using fire-fighting equipment that had been located close to the work-site as part of the PTW requirements.

CCTV recording of the period leading up to the incident showed the fire watch moving potentially flammable material away from the area outside the boiler. However, the portable light unit, which was located inside the boiler, was not readily visible and so was left in place during the hot work.

The Lessons

1. It is vital that emergency procedures are followed. Although in this case the fire was successfully extinguished at an early stage, the master needs to be made immediately aware of all incidents that could affect the safety of the passengers, crew and vessel. Sharing of information also allows a review of actions taken and of potential consequences, such as re-ignition.
2. The raising of a PTW should always involve conducting a thorough risk assessment. In this case, the likelihood that the flame-cutting process would generate sparks should have prompted a thorough inspection of the surrounding area, both outside and inside the boiler, to identify and remove flammable items.
3. Paragraph 14.1.1 of the Code of Safe Working Practices for Merchant Seafarers states: 'Based on the findings of the risk assessment, appropriate control measures should be put in place to protect those who may be affected. . .'. The safety officer had cited the fire watch as an important control measure in this case. However, the particular danger posed by flammable items potentially left inside the boiler had not been identified by the fire watch.

Reprinted from the MAIB Safety Digest 1/2018

CARBON MONOXIDE POISONING STRIKES AGAIN

The owner of a small motor cruiser boarded his vessel at its marina mooring, unzipping one side of the cockpit canopy to gain access. His plan was to start and run the inboard petrol engine. Before starting the engine, however, he noticed a significant amount of water in the engine compartment bilge, which stretched into the cabin area. He started the boat's electric bilge pump to clear the water. Once the water was below the level of the starter motor he started the engine. To assist with pumping out the water, the owner engaged slow ahead while still moored, to force the boat's bow up and cause the water to flow aft into the engine compartment. Approximately an hour later a friend called the owner, but there was no answer. He called another friend who was a berth holder in the marina and asked him to check if the owner was okay. The owner was found face-down in the cabin by two berth holders, with the engine still running. One raised the alarm while the other commenced CPR on the owner. Another person arrived and assisted with the CPR. The first rescuer felt dizzy 10-15 minutes later, and developed a headache. Shortly afterwards, he was helped out of the boat into fresh air.

Paramedics arrived and were directed to the first rescuer initially. After quickly examining him, the paramedics rapidly removed the cockpit canopy and took over first-aid of the boat owner. He was transferred ashore and taken to hospital, but never recovered consciousness. The two rescuers were also taken to hospital suffering from carbon monoxide (CO) poisoning; both made full recoveries. On examination, it was determined that at least two of the flexible rubber bellows of the boat's wet exhaust system were leaking, allowing water and exhaust gas into the boat.

Reprinted from the MAIB Safety Digest 1/2018

LESSONS LEARNED FROM EL FARO ON MAIN PROPULSION PUBLISHED BY USCG

The US Coast Guard has published a safety alert to inform operators and other interested parties of the role that the main propulsion lube oil system was found to have played in the El Faro incident. They have recommended that operators, especially ships' engineers, review the operational procedures and limitations of vital propulsion machinery and verify compliance with SOLAS, Classification Societies and regulatory standards.

The El Faro sank along with its 33 crew onboard in October 2015, marking one of the worst maritime disasters in US history. The USCG official report on the sinking of the El Faro revealed that loss of propulsion during heavy weather was contributing to the sinking. The exact operational status of all vital El Faro engineering equipment prior to the casualty could not be determined, but bridge audio recordings indicate that the vessel lost lube oil pressure to the main propulsion turbine and reduction gear bearings, resulting in loss of propulsion.

It is believed that the vessel's substantial list, coupled with trim by the bow, caused the main engine lube oil pump to lose suction. A detailed modeling and static analysis of El Faro's lube oil system determined that a severe inclination of the ship, coupled with a relatively low volume of oil in the sump, would likely result in a loss of pump suction.

Full details: <https://bit.ly/2qMxxC7>



ARE YOUR FITTINGS LEAK FREE?

While alongside its berth, a coastal ro-ro passenger vessel was using its small auxiliary boiler to provide onboard accommodation heating while the main engines were shut down. Shortly after the boiler began operating, the engine room fire alarm activated, indicating a fire in the vicinity of the auxiliary boiler. The vessel's engineers were mustered and sent to the engine room to investigate. When they approached the auxiliary boiler they saw flames inside the burner casing and smoke entering the engine room through the burner unit's melted sight glass. The engineers quickly shut the boiler down and put the fire out with a portable foam fire extinguisher. When the boiler was examined, the engineers found that the internal fuel supply pipe to the burner nozzle was leaking at a compression fitting. When the pipe was removed, one of its compression fittings was found to be worn and damaged to the point it could no longer provide a seal against the fuel pressure. Fortunately, in this case, the consequences of the fire were not serious. However, boiler explosions, including those resulting in fatalities, have occurred when there has been fuel leakage into a boiler furnace.

The Lessons

1. Regular inspections of the boiler burner unit required the routine removal and refitting of the fuel supply pipe. This provided the opportunity for the condition of the pipe fittings to be assessed. However, as in this case, it also introduced the risk of damaging the seals. All work carried out to the fuel pipework and compression fittings should be closely inspected before being fitted; a zero tolerance on wear and damage will help minimize the risk of fuel leakage and the subsequent introduction of a fire danger.
2. Periodic inspections and maintenance are key to ensuring that equipment and machinery are performing correctly, and enable defects to be identified and rectified. Nevertheless, if the maintenance work introduces faults into the system then this is clearly counterproductive. Formal re-start procedures after an inspection should help ensure that leaks and ill-fitting parts are identified and addressed.

Reprinted from the MAIB Safety Digest 1/2018

RECENT RESEARCH FINDINGS HIGHLIGHT ISSUES WITH DIRTY ENGINE ROOM BILGES

Recent analysis of the Shipowners Club's Condition Survey Programme has highlighted that approximately 25% of the vessels surveyed showed evidence of contaminated engine room bilges. As such, Shipowners Club seeks to raise awareness of the potential fire hazards associated with oily engine room bilges and the checks and steps that a ship's crew and/or surveyor should undertake.

Whilst an oily bilge may not be the immediate source of a fire, any fire that arises in an engine room or machinery space has the potential to escalate and spread rapidly. The presence of oil accumulated in bilges or drip trays act as additional fuel to sustain burning and increase the likelihood of the fire reaching further areas.

With respect to these, the Club notes the following:

- Bilges, especially in the engine room, should be kept clean and free of oil at all times and chemical cleaning should be completed periodically.
- Operators should paint engine room bilges a light colour to assist in visually identifying a fresh leak.
- It is imperative that the source of any oily water in the bilge is fully investigated as oil and water leaking from machinery, pipes and valves within an engine room will seep into the bilges.
- However, a bilge filling up with oil or water could also be a tell-tale sign of a greater problem, such as a leaking propeller shaft, stern seal or cracks in the hull or tank bulkheads.
- PSC officers are increasingly classifying oily bilges as a detainable deficiency, consequently, one of the Club's vessels that failed to safeguard was recently detained. Operators are recommended to refer to the SMS bulletin for guidance on ship specific procedural systems, also to allow for periodic checks on the engine room bilges and ensure that written procedures regarding oily bilge transfer and discharge operations are established.

As previously reported, over 50% of fires within the engine room are caused by fuel/lubricating oil leakage onto hot surfaces. Oil leaks are often due to the failure of pipes and/or associated fittings. These failures can be attributed to a variety of causes including:

- | | |
|--|----------------------------|
| – Mechanical fatigue | – Vibration and pulsations |
| – Chafing/fretting | – Improper securing |
| – Damage during maintenance operations | – Improper repairs |
| – Incorrect tightening procedures | – Poor quality materials |

NEW GUIDANCE ON FIREFIGHTING EQUIPMENT STANDARDS

The US Office of Commercial Vessel Compliance has published a new document entitled "Guidance on Implementation of New Standards for Fire Protection, Detection, and Extinguishing Equipment."

This guidance covers changes to the regulatory requirements for fire protection, detection, and extinguishing equipment used on inspected and uninspected vessels, Outer Continental Shelf facilities, deepwater ports and mobile offshore drilling units.

The policy documentation points to changes after the US Coast Guard's 2016 "Harmonization of Standards for Fire Protection, Detection, and Extinguishing Equipment" rulemaking.

This change affects all inspected and uninspected vessels. The most immediate change relates to portable and semi-portable fire extinguishers. Additionally, the USCG changed the approval standards for fire detection and alarm systems and added, or changed other firefighting equipment and system standards including spanner wrenches for certain small passenger vessels.

The 2016 rule does not affect fixed fire extinguishing systems including carbon dioxide. All mention of extinguishers in this policy document refers only to portable or semi-portable fire extinguishing equipment. This policy is not applicable to foreign vessels subject to SOLAS.

Read the document in full: <https://bit.ly/2KKzfvX>

DECK WATER SPRAY FAILURE HIGHLIGHTED AS ONE OF THE MAIN DEFICIENCIES ON LNG CARRIERS

The US Coast Guard has published an information bulletin about the ongoing issue regarding inadequate deck water spray systems on LNG carriers. US Coast Guard has noted that inadequate coverage of the required areas by a deck water spray system is one of the main deficiencies identified when certificate of compliance inspections are undertaken on these vessels.

The Deck Water Spray system is required by the IGC Code 1993, Regulation 11.3. This requirement text has remained nearly identical back through the GC Code 1983 and to the EGC Code. The new 2016 edition of the IGC Code incorporates the amendments adopted by the IMO MSC at its ninety-third session (May 2014) by resolution MSC.370(93).

These amendments, which entered into force on 1 Jan 2016, consist of a complete replacement text of the IGC Code and will apply to ships whose keels are laid or are at a similar stage of construction, on or after 1 July 2016.

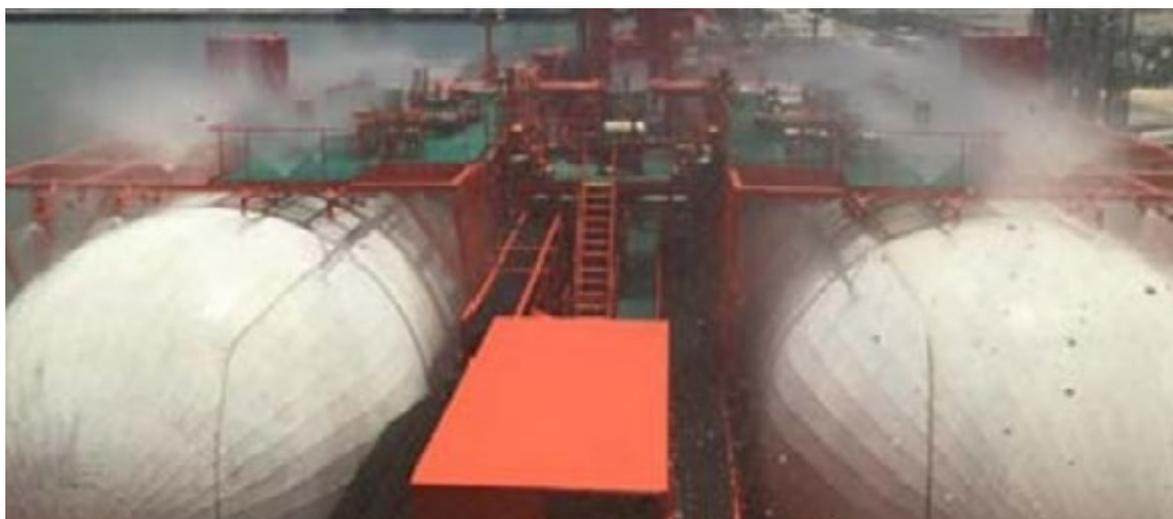
Across the industry, vessel operators and crews have struggled to keep these simple systems operating properly. Ineffective operation of the deck water spray appears easily managed by periodic removal of the installed orifice plates & piping end caps and then flushing the debris from the system. Failure to do this allows for the rapid and substantial build up of debris behind each orifice plate.

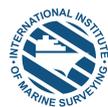
This situation, like plaque in an artery, has gone undiagnosed for decades as vessel crews endlessly poke at the clogged nozzles in futile attempts to cure a more severe and untreated issue.

Experience added with the volume of CoC-Gas exams has helped Sector PSCOs understand and accept that individual deck water spray nozzles are likely to be found blocked or ineffective every time a water spray system is energized. Circumstances and design should help dictate the observed severity of a blockage. If one of two nozzles is blocked over a cargo manifold, it is likely a bigger deal than one or two of 12 nozzles covering the same area. PSCOs assess each situation encountered individually and base written deficiencies on "adequate coverage".

USCG experience has shown that if vessel crews or management are unaware of the orifice plates installed throughout the water spray system, the system will be rendered ineffective within only a few years of construction. This leads to problems and frustration with the ship's crew, problems during inspections and more importantly an unresolved and tacitly accepted degradation in a significant safety system on these vessels.

For several years we have informally asked Classification societies and Flag State Administrations to take a more active role during annual inspections and share this simple fix with no apparent results as failures and inadequacies of this system are still being identified.





International Institute of Marine Surveying Notice of Annual General Meeting

Venue: Hilton Garden Inn, Eastern Perimeter Road, Longford, Hounslow, Middlesex TW6 2SQ (by Heathrow Airport)

Time: 13.00 to 15.00
Date: Tuesday 26 June 2018

- 1) Apologies
- 2) Minutes of previous AGM held in September 2017
- 3) President's Report
- 4) Chief Executive Officer's Report
- 5) Director's Reports
- 6) Elections
 - a) Management Board
 - b) Peter Broad FIIMS election as Deputy Vice President
- 7) Voting on
 - a) Proposed fee structure for 2019 membership
 - b) Change to the IIMS disciplinary procedure
 - c) Plan to move in principle from rented accommodation to property purchased outright by mortgage
 - d) Development of a non-mandatory higher membership level accreditation scheme
- 8) Fellowship Awards and Honorary Membership
- 9) Any Other Business
 - a) Presidency hand over from Adam Brancher to Capt Zarir Irani

Voting

As you will see, a number of matters require voting on this year and your vote matters. You are reminded that only Full Members who have paid their membership fees are entitled to vote. Full members who join the AGM online cannot vote on the day and must have completed the Postal or Proxy Voting Form, or given their Proxy Vote to the President or other Full Member who will be present in the room. The deadline for postal and/or proxy voting is 22 June 2018. This form can also be downloaded from the IIMS website address as below.

Important notes about the 2018 IIMS Annual General Meeting

Everything you need to know about the 2018 AGM will be stored on the password protected page on the IIMS website at <https://bit.ly/2segbPm>. The password is Survey.

The CEO's report and reports from Chairmen and Regional Directors will be published there over the coming weeks and are available to download from this page before the meeting.

Attendance at the AGM is free either in person or as an online delegate. This year's AGM will be streamed live by Zoom for the first time. So, no matter where in the world you are, you can join the AGM online. However, if you plan to join as an online delegate, you must register your place via the website at <https://bit.ly/2segbPm> and online joining instructions will be emailed to you. The deadline for registering is 25 June at 17.00 UK time. If you plan to attend the AGM in person, registration is not required.

SMALL CRAFT SURVEYORS FORUM TO MEET AT SEAWORK IN JULY

On Wednesday 4th July, the Small Craft Surveyors Forum will present their highly popular, annual seminar at the Seawork show in Southampton from 13.30 in Conference Room 2. This is a free to attend event and anyone is welcome to sit in and listen, but please register your place - see below.

The programme for the afternoon is as follows:

- 13.30 Introduction by Trevor Blakeley (CEO RINA)
- 13.40 Challenges for 24m and mini ISM Code vessel surveyors by Richard Franklin, Braemar Yacht Services
- 14.30 Tonnage Measurement. Calculating Load Line Length, breaks and depth by Paul Johnston, Euro Marine Surveys
- 15.15 Tea/coffee break
- 15.30 The importance of maintaining and extending your knowledge and skills as a marine surveyor

A panel chaired by Mike Schwarz (IIMS CEO), comprising Nick Gladwell (SCMS - workboats); Hugo Morgan-Harris (YDSA/IIMS - sailing yachts) and Richard Linford (YDSA - mentoring) – will look at and discuss some of the issues the associations experience, and will invite delegates to put forward views from their perspective. Questions submitted beforehand will be welcome.

- 16.15 Conclusion and Close

The seminar is free to attend but please reserve your place at <https://bit.ly/2IR9rB2> so we have numbers for H&S, chairs and catering.

SCSF Member Organisations include RINA, IMarEST, IIMS, SCMS, NI, YDSA



MARINE SURVEYING ACADEMY CORPORATE RESTRUCTURE

The Marine Surveying Academy (MSA), a wholly owned subsidiary of IIMS, has made a number of appointments to bolster its board. As part of a succession plan, Mike Schwarz and Hilary Excell have been appointed Executive Directors alongside existing Director, Paul Homer.

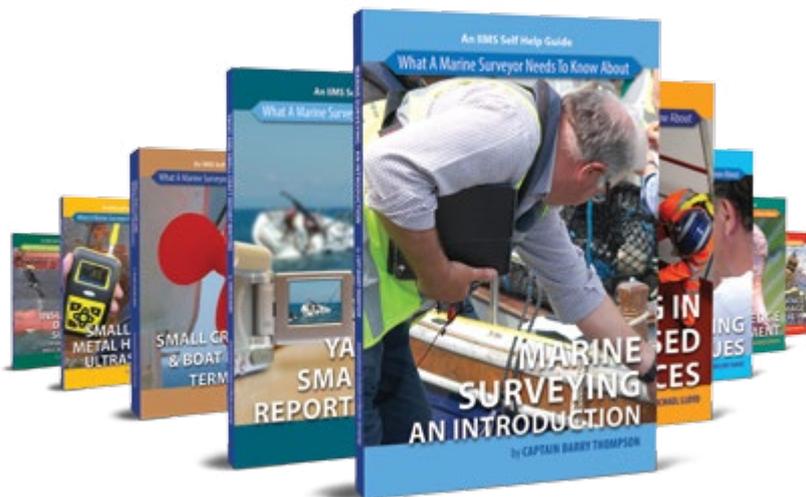
Additionally, MSA has appointed two non Executive Directors, both IIMS members. They are Ian Coates and Mike Proudlove. In their role as non Executive Directors, Ian and Mike will be involved in helping and advising the MSA executive team with current projects (the IRMII qualification,

RMCI superyacht paint coating standard and eCMID Accredited Vessel Inspector Scheme) as well as looking at new opportunities in associated marine sectors.

Commenting on their appointment, Paul Homer said, "We are grateful to have two experienced IIMS members from different backgrounds join the Board in a non-exec capacity. Their knowledge and skills will be invaluable and will help us to make sound and sensible commercial decisions".

SEVENTEEN IIMS HANDY GUIDES NOW AVAILABLE TO DOWNLOAD IN PDF FORMAT

The series of IIMS handy guides, launched a couple of years ago in paperback format under the collection heading of 'What a marine surveyor needs to know about', stands at seventeen publications currently.



IIMS has now taken the bold move to release the entire series of handy guides additionally as eBooks in downloadable pdf format, available exclusively via the IIMS website. So now the publications are available in paperback and eBook formats.

Delivering the handy guides in this new, downloadable format means that IIMS can offer them at a lower cost, typically discounted by up to 25%, as there are no printing and carriage charges to apply.

The latest handy guide to be published is *What a marine surveyor needs to know about surveying sails* by Ian Nicolson. To view the range of handy guides in downloadable pdf format go to <https://bit.ly/2G2SfT8>.

IIMS LAUNCHES PAY PER VIEW TRAINING VIDEOS

IIMS has been publishing Conference and seminar videos on the web site and also available to view freely on its YouTube channel - see <https://bit.ly/2c7Vpuz> - so that is nothing new. However, IIMS has now launched a Pay Per View section on the website where much longer, in depth training videos can be purchased. By purchasing a video, you get a full copy to keep. The collection will grow, but for now consists of two videos made by IIMS.

Report Writing Online Seminar

This three-hour seminar, featuring a lot of new content, brings the art of report writing bang up to date and aims to provide the essential information that a yacht and small craft surveyor needs to consider when gathering the information and then compiling his/her report.

For more info see <https://bit.ly/2pJ7NoF>.

How to conduct a complete mast and rigging survey

Using a series of photos, Kim Skov-Nielsen delivers an informative and powerful masterclass on the subject of inspecting and surveying masts and rigs using his extensive knowledge, gained over many years. He talks about how to inspect the mast and rigging, when to inspect it, what to expect as you inspect and what specifically to look for and where. He also speaks about how to include the findings and recommendations in the report as well as caveats. In his presentation, Kim touches on all types of rigging from rope to galvanised steel wire to carbon, as well as looking at different types of masts too, whilst reminding surveyors to keep a clear focus on their personal safety.

For more info see <https://bit.ly/2qFofHd>.



EXTRACT FROM THE 2018 AGM OF THE IIMS ALUMNI ASSOCIATION NIGERIA BRANCH HELD AT LAGOS

“My dear Colleagues,
It is my pleasure to welcome you all to the first Annual General Meeting of our Association, International Institute of Marine Surveying Nigeria Branch.

You will recall on 31 May 2016, the West Africa Regional Director, Mr Monday Ogadina, inaugurated the IIMS Nigeria Branch at this venue. It was about 35 days short of being exactly 2 years ago. At the inauguration a 9 member Executive Management Committee was elected for the Branch and it consisted of:

Chairman:	Engr. Emeraku Ijioma	Committee Members:	Capt. Tajudeen Alao, Engr. Kuzi Onyibe, Capt. Ade Olopoenia, Capt. Benson Aja-Ukpabi, Capt. Oladipupo Olubowale Mr. Ralph Opara
General Secretary:	Engr. B. Peter Onwordi		
Treasurer:	Mr. Peter I. Enerichekor		

Some of the members had been concerned that your Branch Chairman had not updated members with situations concerning our branch. I appreciate your frustrations in this regard.

The truth is that the Executive Committee that you elected the day our IIMS NIGERIA Branch was inaugurated had been assiduously working toward ensuring that our Association is recognized by Nigerian laws so that we could go about our activities legitimately. I am happy to announce that we been registered and the name for our branch is INTERNATIONAL INSTITUTE OF MARINE SURVEYING ALUMINI ASSOCIATION, NIGERIA BRANCH. This is the name we were able to obtain Corporate Affairs Commission (CAC) approval for. Following this we proceeded to making sure that we opened a bank account which details have been circulated to members by the Treasurer.

The silence on our part had been occasioned by the fact that the EXCO need not bore members with challenges being faced in the process of registering the Association with CAC. I can assure you that major decisions regarding the selection of name were made with the consent IIMS Headquarters. The choice of name that we got was accepted so long as it is recognized by the laws of Nigeria. To the IIMS Headquarters, we remain IIMS Nigeria Branch.

I would like to, at this point, appreciate the collective and individual contributions of EXCO members toward the attainment of this goal. For your information, the EXCO members taxed themselves financially to make sure that we pursued the Branch CAC registration without having to deplete our funds. The Treasurer will present a detailed statement of our financial activities when he delivers the financial report.

Let me once again welcome us all to this 2018 AGM of IIMSAA Nigeria Branch”.

Prepared and submitted by Engr. Emeraku Ijioma OON CEng FRINA FNSE MIIMS FAEng Naval Architect and Marine Surveyor

IIMS SINGAPORE SEMINAR

For operational reasons, IIMS has cancelled its planned seminar in Australia. However, it has been decided to arrange an event in Singapore that will appeal to both IIMS members and eCMID inspectors alike.

The three day event will run from 31 July to 2 August. The first day is a dedicated eCMID AVI accreditation validation course. Day two offers a range of topics of relevance to both sectors and the third day focuses more on general surveying matters.

Full details of the event can be found on the IIMS website.



IIMS WELCOMES NEW MEMBERS FROM SOUTH KOREA

IIMS is delighted to welcome five new members to the Institute as full Members from South Korea from February 2018.

Peter Broad FIIMS, IIMS in country representative for South Korea, has been working together with the five surveyors for many years on new building projects in some of the biggest shipyards in the world and on some of the most technically advanced vessels to enter into global service.

Whilst Peter's Korean colleagues are not all 'Surveyors' in the truest sense of the word, as he points out, "we have to remember that the work of a New Building Superintendent and In Service Superintendent is a form of surveying."

"We all work to sets of Rules and Standards and have to make decisions based on our technical experience and educational background.

"We all have to write reports that are clear and concise.

"We have to engage with our clients, from the Ship Owner and Technical Manager to the Shipyards and their sub-contractors.

"We have to conduct ourselves in a professional manner."

While many of Peter's colleagues have previous sailing experience as either Master Mariners or Chief Engineers they have applied for membership based on the IIMS 'Experiences matrix' category 'N' Superintendency. Peter believes that in the future IIMS can expand this category to embrace more marine professionals in this diverse part of the industry (ship building and ship repair).

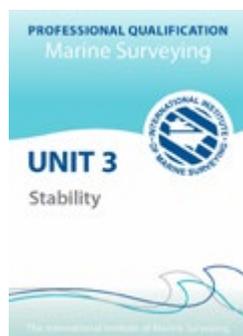


*Photo, from left to right:
Mr Jung Min LEE, Mr Sung Hyun KIM, Capt Eun Seong JEON, Mr Woo Young BYUN, Mr Si Won KIM, Mr Peter BROAD.*

Peter and his colleagues are all continuing to work on their CPD and are always expanding their knowledge of ship new building technology.

Web site: www.broadreachmarine.com

ONLINE TUTORING AND MENTORING



The first online mentoring session with students studying for the IIMS Professional Qualification in Marine Surveying took place recently. The idea was simply to connect students currently working on Unit 3 – Stability – online via a live stream with the assessor and tutor of that module, Carey Golesworthy.

Several students accepted the chance to take advantage joining from as far afield as Canada, Bali and New Zealand. Although it was envisaged to last perhaps forty five minutes, the group chatted on with questions and discussions for nearly two hours.

The event was deemed such a success that IIMS plans to extend the programme with a series of 'Meet the Tutor' online sessions over the coming months. Watch for further details.



IIMS INDIA SEMINAR

The date for the next biennial IIMS India Branch Conference has been set for 10 October 2018 to be held in Mumbai. More details will be available soon.

REPORT ON THE WESTERN MEDITERRANEAN LYSCWG TRAINING EVENT

The annual IIMS Western Mediterranean Large Yacht & Small Craft Working Group training event took place

in Palma on 26-27 April and attracted 18 surveyors. As well as local Mallorca based IIMS members, others had travelled from Portugal, Gibraltar, Ireland, mainland Spain and France to take part in the event.

On the first morning, the group travelled by bus to the METALNOX facility. METALNOX staff explained how they repair and recondition propellers and check and repair shafts. Surveyors were given a demonstration of the Prop Scan software that is used to optimise propeller performance.

After lunch, the group headed into the classroom for three presentations. First to speak was Karen Brain, Matrix Insurance, who talked about the various types of insurance a surveyor should consider.

Phil Duffy talked knowledgeably about surveying superyachts and in particular some of the key survey differences between looking at vessels above and below 24 metres. He stressed the importance of making the initial written quotation process a highly professional one.

Bob Hoghton spoke about Mini ISM and explained the history behind how and why the international safety management code was developed and became necessary.

On the second day, surveyors met inside the superyacht show as Mike Schwarz, IIMS CEO, gave a verbal update on head office matters and developments.



The group then headed out to spend the morning as guests of Oscar Sierra, one of the largest, specialist providers of marine safety equipment in the Western Med. To start with, the group was shown how fire extinguishers are serviced, including being repressurised and refilled. Moving across to the other side of the facility, surveyors observed some of the staff actively inflating life rafts to check pressures and to ensure the seams and stitching were in good order as part of the servicing regime.

IIMS CERTIFYING AUTHORITY SPRING 2018 TRAINING DAY

A group of 20 delegates, including some online, joined the training day, held this year at PETA near Portsmouth. The day proved to be full on, thought provoking and provided a forum for some intense and excellent debate.

The first presentation was given by Rob Aldous, Managing Director of Fireboy-Xintex. His topic was fire detection and suppression in sub 24 metre vessels. John Excell followed Rob and talked about the importance of accident reporting.

The first afternoon presentation was entitled life raft specification and associated servicing and was expertly presented by Alistair Hackett from 3si Ocean Safety. Part of Alistair's presentation included a practical demonstration, during which two life rafts were inflated in the room for inspection and discussion.

Mike Schwarz closed the day with some updates on recent documents issued by the MCA affecting coding surveyors and offered some practical advice and guidelines for Certifying Authority examiners.

TONNAGE TRAINING REPORT

The first IIMS tonnage training day organised by IIMS to run in the UK for some considerable time in mid May attracted an international delegation of nearly twenty members and non-members. The event, held at Itchenor Sailing Club, could not have been at a better or more suitable venue and the weather duly obliged with a hot, sunny day.



John Excell, Chairman of Large Yacht & Small Craft Surveying delivered tonnage measurement theory in the classroom during the morning. After lunch the group split into two groups. The first one set about measuring a rib, which was set on the hard. The other group headed down on to the pontoon to measure a 28 foot motor vessel in the water. Once complete, the groups swapped vessels and completed the exercise.

Delegates assembled in the classroom at the end of the day and the groups compared their tonnage measurements, which certainly had some discrepancies between them.

ECMID AVI SPRING 2018 SEMINAR

The third eCMID Accredited Vessel Inspector seminar took place at Heathrow Airport, London on Tuesday 22nd May. The event, organised by IIMS subsidiary, Marine Surveying Academy, attracted an audience of around 50 delegates with almost as many online as were physically in the room. The seminar was hailed a great success by all who attended it judging by the feedback received afterwards.

Mike Schwarz hosted the event. He also gave a comprehensive update of the eCMID AVI Scheme. Lead tutor for the programme, Ian Coates, Managing Director, Specialist Marine Consultants Ltd, was next to speak. He talked openly about the key learnings from the eCMID AVI accreditation courses he had personally run and gave a frank overview of the current state of the marketplace.

A strong delegation from IMCA, owners and developers of the eCMID standard, was present. Mark Ford, IMCA Technical Manager, gave an update on the eCMID eDatabase and other new announcements hot off the press regarding the scheme. He also took a number of questions from delegates, supported by his fellow IMCA colleagues Adam Hugo and Jordan Lawler. Another IMCA representative and technical advisor, Andy Goldsmith, spoke about the important subject of the reactivation of DP vessels. From feedback, it is clear that this is a key topic and more time will be given over to this going forward.



The afternoon session was opened by Peter Solvang, Managing Director, DP & Marine Assurance Norway AS, who tackled the complex subject of inspecting a DP vessel and the eCMID DP supplement. Mike Proudlove, Operations Manager, Offshore Turbine Services, took to the stage and spoke knowledgeably about the challenges of inspecting windfarm vessels from an operator's perspective.

The final presentation of the day, a second one, was given by Ian Coates. He spoke passionately about inspections for the windfarm industry and the MISW supplement, highlighting some of the new geographic regions that will provide opportunities in the future.

REPORT ON IIMS 2018 BALTIMORE CONFERENCE

Entitled "Tools & Rules", the IIMS 2018 Baltimore Conference took place on Friday 23rd and Saturday 24th March at The Marine Conference Center, MITAGS (Maritime Institute of Technology and Advanced Graduate Studies) in Baltimore. Heavy snow in the north east of America took its toll on the delegate numbers, much to organiser, James Renn's disappointment. But those who got to the event were treated to a couple of days of first class presentations given by some highly knowledgeable and capable individuals on a broad range of topics.



Mike Schwarz opened up the first day when he spoke about 'An Introduction and Explanation of eCMID-Common Marine Inspection Document and Accreditation Scheme'. He was followed by Joseph De Remer, Beacon Marine Service, who spoke on the topic of corrosion and its causes and prevention. Brook Stevens from Sea Keeper talked about the eye-opening subject of the latest technology in gyroscopic stabilization, a fascinating topic. Just prior to lunch, the group headed for a visit to the ship bridge simulator, which made for an extraordinary 20 minutes as a real live scenario was created as the ship came into Baltimore docks with the added challenges of inclement weather and even an iceberg looming large.



Lloyd E. Griffin III presented 'Metal vessel damage investigation and repairs by the numbers – NVIC's, NAVSEA codes and standards'. Next to talk was James Renn on propulsion emissions and the "Tier" system and the potential for Surveyor profit. The day was brought to an end by David DiQuinzio. He spoke about the work that Annapolis Hybrid Marine is doing installing electric propulsion systems and alternate new build and repower solutions.

Day two was opened by John Cavenner, who spoke about estimating by general rule canvas losses, top fame costs and the types of clear enclosures material and lifespans. Erich Black returned for the second year with an update on infrared technology and the Flir photo camera and moisture meter combination. Fredric Wise joined the meeting and talked about his project to rebuild from frames up of a 1965 43' wooden sailing vessel.

After lunch, experienced rigger, James (Tripp) Ewers III, delivered a presentation entitled 'An explanation and understanding of commercial and recreational sailing vessel rigging per NVIC 0216. Explanation of cited maintenance and inspection procedures'. It fell to Richard Parks, (ex US Navy) to introduce his salt meter gauge as he talked about the state of the art soluble salt and conductivity with regards to ISO 8502-6 and 8502-9 and how the procedures relate to standards and NAVSEA.

IIMS is grateful to James Renn for his considerable efforts in putting together such a valuable two day programme. Videos of the event are freely available on the IIMS YouTube channel at <https://bit.ly/2c7Vpuz>.

REPORT ON THE FIRST INLAND WATERWAYS WORKING GROUP EVENT



A group of 20 surveyors came together to inaugurate the IIMS Inland Waterways Working Group, held at P&S Marine, Watford. IIMS would like to express their thanks to Ralph and Tom from P&S Marine for making the facility available and also to Jon Sharland, Tritex NDT, for being on hand with his thickness gauge testing equipment.

The morning started with an overview of welding and welding techniques, studying good and bad welds. As the morning went on, those who wanted to have a go at welding got their chance, providing an understanding of just what a skill it is.

A basic inspection of an overplated narrowboat took place under the auspices of Jeffrey Casciani- Wood, who seemed to take delight in wielding a 2lb hammer to test the steel hull integrity. After lunch, the group talked about how they might report what they had inspected. Other aspects of best practice report writing were also discussed.

IIMS is keen to draw up a best practice document to cover the topic of overplating (or doubling as it is also known). Whilst not a legal document or regulation, the aim is to provide and publish a set of guidelines to help surveyors in what is something of a grey area. Jeffrey Casciani-Wood presented his thoughts, aided by John Heath (IIMS Technical Director), who will be responsible for agreeing the final document, its wording and content.



The next IIMS Inland Waterways Working Group event is planned for 15 October 2018 at a venue yet to be announced, but almost certain to be in the UK midlands. Watch for details.

REPORT ON SURVEYING MASTS AND RIGS TRAINING DAY

Kim Skov-Nielsen MIIMS is something of an expert when it comes to surveying masts and rigs, as those who attended the one day course on Southampton in March were to discover.



A group of 20 surveyors came to the event in person, with more joining the morning session online via Zoom. The morning session comprised a series of photos, which Kim used as the backdrop for his comprehensive overview of this important, but often overlooked and sometimes misunderstood area of surveying.

After lunch the group headed down to the nearby Rig Shop. The team had laid out two masts and rigs together with a number of recovered broken and damaged parts and fittings for review. It was plain to see that one of the masts was not fit for purpose and should be condemned. The other mast and rig, from a 56'

Oyster, proved to be more of a challenge. No clue was given to delegates, other than there was a potentially serious flaw and their task was to try and establish what it was. IIMS would like to extend its thanks to The Rig Shop, Southampton for their help.

FELLOWSHIP AWARDS

The International Institute of Marine Surveying is pleased to announce a number of awards made to some of its senior members. The awards will be formally and publicly recognised at the AGM, being held in London on 26 June 2018. Congratulations to those who have been recognised for their contribution to the Institute.



JOHN HEATH

Awarded an Honorary Fellowship

John Heath has been one of the cornerstones of the Institute for many years and has acted as Technical Director for the organisation. His knowledge and surveying experience, particularly in matters of stability, is second to none; and as he starts to wind down his surveying activities, it is fitting that he has been awarded an Honorary Fellowship. As well as an active member of the management board, John is also Joint Deputy Chairman of the IIMS Certifying Authority.



CAPT JOHN NOBLE

Awarded an Honorary Fellowship

Capt John Noble has served IIMS and the surveying profession with distinction over many years. He has held a number of positions within the organisation. As well as being an active member of the management board, John holds the post of Chairman of Administration (responsible for the Head Office function) and also chairs the Education Committee. It is for these reasons, coupled with his mentoring skills, that John has been awarded an Honorary Fellowship.



MILIND TAMBE

Awarded an Honorary Fellowship

Based in the Mumbai area of India, Milind has been a stalwart of the organisation for many years. He has been a regular visitor to IIMS Conferences and training events in the UK and elsewhere in the world. Milind has presented at IIMS events on his specialist subject, imaging techniques and how to get the best use of your camera whilst on survey. Milind retired as Regional Director of IIMS India after a long stint and is recognised for his efforts in developing the Institute in India.



TONY FERNANDEZ

Awarded an Honorary Fellowship

Those who know Tony are unlikely to ever forget him. He is a larger than life character and an inspiration to many younger surveyors as well as some senior ones too. When Tony delivers a presentation, he does so with aplomb using his many years' surveying experience, leaving a positive impression. Tony is a guru to many surveyors in India and IIMS is delighted to award him an Honorary Fellowship.



PARIMAL KANTI BHATTACHARYYA

Awarded an Honorary Fellowship

Located in India, Parimal has been a member of the Institute for many years. He has been a regular attendee at IIMS India conferences over that time and has presented papers on iron-ore carriage and has written articles for the Report Magazine. Parimal is highly regarded by his peers in India and this award recognises the respect in which he is held.



CAPT EUGENE CURRY

Awarded a Fellowship

Based in the fair city of Dublin, Ireland, Capt Eugene Curry has been a long standing member and supporter of the Institute. Eugene has been an active and valued member of the Professional Assessment Committee. He is one of those senior members who assesses potential new membership applications. It is for his outstanding dedication in this role that Eugene is awarded a Fellowship.



CAPT IAN COATES

Awarded a Fellowship

Ian is an entrepreneurial surveyor running a successful business, Specialist Marine Consultants Ltd, which he established in 2006. Ian is also an eCMID accredited vessel inspector. Since 2015, Ian has been lead tutor for the eCMID scheme and has personally delivered a number of courses as well as helping to develop the course and its content. He has also recently become a non-executive Director of the Marine Surveying Academy.



JAMES 'RANDY' RENN

Awarded a Fellowship

James is known to many IIMS members and has been recognised by the Institute for his work on behalf of the organisation. He is a frequent visitor to conference and AGM in the UK and is the IIMS USA Regional Director and a member of the management board. Over the years, James has worked tirelessly to attract new members and to promote the Institute's education programme. He has organised successful conferences in Baltimore.



JOHN WALKER

Awarded a Fellowship

John (or Johnnie to his friends) Walker is an experienced yacht and small craft surveyor based in Palma, Majorca. He is also a recent recruit to the IIMS Professional Assessment Committee. John has acted as the non-elected Chairman of the IIMS Western Mediterranean Large Yacht & Small Group for a number of years. In recent years, his impetus and contacts locally have helped the group to flourish. It is for this reason that he is awarded a Fellowship.



PETER VALLES

Awarded a Fellowship

Peter has been Chairman of the IIMS Dubai branch for the past couple of years and prior to that, an energetic committee member. His organisation, Inchcape, has sponsored IIMS events and functions in the region. Peter has hosted the past two IIMS Dubai Conferences. He is recognised for his good work with the committee, IIMS Dubai branch and for promoting the aims of the Institute generally in the Middle East.



CAPT RUCHIN DAYAL

Awarded a Fellowship

Ruchin has been a staunch supporter of the IIMS since becoming a member some years ago. He has presented at various IIMS Conferences and seminars on an area he has a lot of expertise in - the IMSBC code and iron ore fines. Ruchin has also been responsible with his colleagues in Goa for developing and launching ground breaking Apps for the institute and is currently working on a new Surveyor Search App.

STERLING GLOBAL MARINE ACQUIRES GEOFF WADDINGTON & PARTNERS

Sterling Global Marine, a leading surveyor of private and commercial vessels, has announced it has acquired marine surveying company, Geoff Waddington & Partners. This move sees Sterling Global Marine become one of the fastest growing independent marine surveying companies in the UK, allowing the company to significantly upscale its business across both the leisure and commercial industry sectors.

Sterling Global Marine has experienced rapid growth and success worldwide since its creation in 2015. Spearheaded by founding director, Lee Warltier, the company specialises in all disciplines of marine surveying, including new build project management, coding and MCA compliance, draft and bunker surveys and project cargo.

Geoff Waddington, former Managing Director and Chairman, commented: "Following my retirement from Geoff Waddington & Partners and having worked alongside Lee previously, I am confident that Sterling Global Marine is the perfect fit for our customers moving forward. I can say with certainty that their company will provide a high level of expertise and excellent service and I hope that that our present customers and colleagues in the marine industry continue to use the team in the future."

Lee Warltier, Director of Sterling Global Marine, added: "Over the past three years we have worked on expanding the company and welcomed a number of surveyors to our team – each with specific areas of expertise.

"This has allowed us to diversify in the industry and keep a very high level of professionalism in all that we do. Geoff Waddington & Partners is a renowned marine surveying company with a strong reputation, particularly in the areas of yacht shipping and cargo surveys."



New IIMS members in the last quarter include:

Full members

Andrea Mastellone	MIIMS	Italy
Emmanuel Inkoom	MIIMS	Canada
Joao Goncalves	MIIMS	Mozambique
Jonathan Mills	MIIMS	UK
Kafaru Lawal	MIIMS	Nigeria
Roopesh Nair	MIIMS	UAE
Russell Bradley	MIIMS	Canada
Scott Ure	MIIMS	UK
Stephen Hawthorne	MIIMS	Hong Kong
Thomas Hustler	MIIMS	UK
Yuri Oshurko	MIIMS	Canada

Technician members

Marc Lawrence	TechIIMS	UK
Markku Sandell	TechIIMS	Finland

Associate members

Giovanni Palama	AssocIIMS	Italy
Guy Nicholls	AssocIIMS	UK
Richard Franklin	AssocIIMS	UK

Affiliate members

Divyesh Modi	AffIIIMS	India
Michiel Lijnsvelt	AffIIIMS	Spain
Mohammad Azam	AffIIIMS	Australia
Muhammad Sadique	AffIIIMS	Pakistan
Petro Zaarour	AffIIIMS	UK
Hanspeter De Koning	AffIIIMS	Dominica Republic

Corporate member

Braemar Yacht Services	CorpIIMS	UK
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Students who have passed the IIMS Professional Qualification in Marine Surveying and who have received their Diploma in the last quarter are:

Professional Qualification in Commercial Ship Marine Surveying
Philip Corsano

HNC in Marine Surveying
Noel Parry

Professional Qualification in Yacht & Small Craft Marine Surveying
Ian Braham
Richard Thompson

Michael Willie
Ross Collingwood



OBITUARY**HUGO DU PLESSIS HonMIIMS**

The sad death of Hugo Du Plessis has been announced at the age of 94. Expert yacht surveyor and author of a guide to fibreglass boat construction and maintenance, Hugo had been an Honorary member of IIMS for some years.

Highly regarded in the cruising world, Hugo was an experienced sailor. Born in 1923, he and his sister were home educated before he went on to boarding school and then to Southampton University where he studied electronics.

Hugo was just 16 when the Second World War broke out and he served with his father, Gerald, in the Boldre Platoon Home Guard.

Growing up in the English New Forest, Hampshire, in close proximity to the Beaulieu and Lymington rivers, his love of boats was born. Many happy hours were spent negotiating the low tide mudflats in various craft from a Sharpie to a canoe before he eventually purchased his first yacht, Crimson Rambler.

Between 1942 ND 1946, Hugo undertook National Service in the Fleet Air Arm as a radar technician, working on the development of microwave radar for night fighter aircraft.

Hugo's growing interest in electronics continued after the war and he worked at Decca Navigator in Weymouth. At this time his knowledge of fibreglass as a material grew and with this his interest in writing too. He also cruised extensively in his yacht, a Bermudan sloop, visiting the Channel Islands, France, Spain and Ireland.

He met Joyce Keevil, a pharmacist from London and they married in 1952, settling in the Boldre area of Hampshire. Hugo's two children were born, Primrose in 1962 and so Christopher the following year.



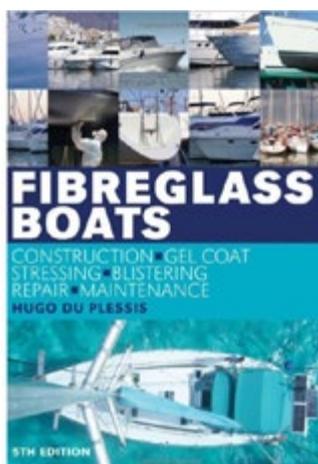
During the 1960s, Hugo and his business partner, Mick Hammick, founded the Ropewalk Boatyard in Lymington, later to become known as Lymington Yacht Haven. He further developed his knowledge of fibreglass and became a marine surveyor of repute. His first edition of Fibreglass Boats was published in 1966.

Following the death of his mother, he moved his family to Bantry Bay in West Cork, Ireland. Here he continues his work as a surveyor and established his first yacht charter business. He cruised the south west of Ireland

extensively and was Commodore of Bantry Bay Sailing Club for many years.

In 1986, Hugo set out to achieve his lifelong ambition of sailing around the world. However he got no further than the Caribbean, the beauty of which turned his head. He was to remain there living on his 36" Westerly Conway, Samharchin, for 15 years. During this time, he continued to write for well-known magazines, including Yachting Monthly, Yachting World and Practical Boat Owner. He also updated his book Fibreglass Boats.

Hugo returned to the UK in 2001 following the death of his sister and moved into her house, remaining there until 2016 when his health took a turn for the worse and he moved to a care home.



Fibreglass Boats is available from Bloomsbury Publishing at <https://bit.ly/2v3KkVi>

Publishing the fifth edition of Fibreglass Boats in 2010, Hugo continued his passion for writing right up until just a few weeks before his death.

He was a life member of the Royal Cruising Club, joining in 1947 and won the Romola Cup, The Dulelbella Prize and the Founder's Cup.

Hugo is survived by his children, Primrose and Christopher, his grandchildren and five great grandchildren.

**Hugo Du Plessis HonMIIMS
1923 – 2018 Rest in Peace.**

METALS AND THEIR CORROSION BEHAVIOUR IN SEAWATER

A brief overview of metals used in seawater and common corrosion issues to be avoided

By **CAROL POWELL** BSc CEng FIMMM MIMarEST¹ and **MARK TUR** MIMMM MCIM MBA²

¹ Consultant to Nickel Institute and Copper Development Association

² Consultant to Copper Development Association

The majority of metals are susceptible to corrosion in one form or another in seawater. Their successful application relies on knowledge of the types of corrosion each alloy might be susceptible to and how to avoid potential problems by good material selection, design, fabrication and operational practices. Seawater, of course, is very complex and its composition varies. It contains many different salts, dissolved gases, trace elements, suspended solids, decomposed organic matter and living organisms. Also, temperature and biological activity alter with local climate and season.

The corrosion behaviour of metals is largely influenced by oxygen in the seawater as well as flow velocity, temperature, pollution and marine organisms. As it is a good electrolyte, seawater may also lead to galvanic and localised corrosion in susceptible alloys. The following overview describes the relative corrosion resistance of several alloy families used in seawater systems, the more common types of corrosion which can occur and how these can be mitigated. The main properties covered are resistance to general corrosion, erosion corrosion, pitting and crevice corrosion, selective phase corrosion, stress corrosion cracking, galvanic response and biofouling. Suggestions for further reading are given at the end.

Carbon Steel and Cast Irons⁽¹⁾

Steel is the basic alloy used for marine structures in seawater and its corrosion resistance is primarily governed by the diffusion of oxygen in the water to the steel surface. General corrosion rates in quiescent seawater are in the order of 0.1-0.2 mm/yr but with pitting at several times this depth. Flow of seawater across the steel surface increases the corrosion rate and at 3 m/s, a velocity often used in pipe systems, the corrosion rate is increased to about 0.75 mm/yr (Figure 1). At higher velocities, the corrosion rate continues to increase, for example, 5 mm/yr at 40 m/s and velocities of this order may well be reached in areas of local high turbulence.

Grey cast iron and unalloyed spheroidal graphite iron behave in a similar manner to steel and the corrosion rates are comparable. However, over time, cast iron is also prone to graphitisation, a form of corrosion in which the iron is corroded, leaving behind a deposit of graphite, silica and iron corrosion products. Although its implications are discussed later, the metal surface may appear uncorroded but a sharp tool can reveal that serious loss of section has occurred.

Corrosion of steels and irons are largely understood and corrosion can be controlled by including an extra thickness as a corrosion allowance, applying coatings and/or cathodic protection (CP). Another alternative is to select more resistant alloy systems.

Stainless Steels

A stainless steel, by definition, is an iron alloy with more than 10.5% chromium. There are many grades of stainless steel with a range of other alloying additions to influence the alloy structure, mechanical properties and corrosion resistance. These alloys owe their corrosion resistance to the formation of a passive chromium oxide film on their surface. This forms in air and there is enough oxygen under most seawater conditions to maintain the film and protect the underlying metal from corrosion.

The general corrosion rate for the types of stainless steels used in seawater is very low at about 0.002 mm/yr. By improving oxygen availability, the flow of seawater

across a stainless steel surface helps maintain the passivity and prevent corrosion, thus above 1 m/s and even at velocities as high as 40 m/s—or until cavitation occurs—the corrosion rate remains low.

Movement of seawater across the steel surface over about 1 m/s also tends to prevent deposits and biofouling and discourages local pitting. However, under quiet conditions and at crevices or under macrofouling or other deposits, where the oxygen becomes locally depleted, the oxide film may break down. Aided by seawater chlorides, a dynamic electrochemical cell forms such that the exposed metal rapidly corrodes (Figure 2). Crevice corrosion occurs more readily and at lower temperatures than pitting in seawater in the same bulk environment.

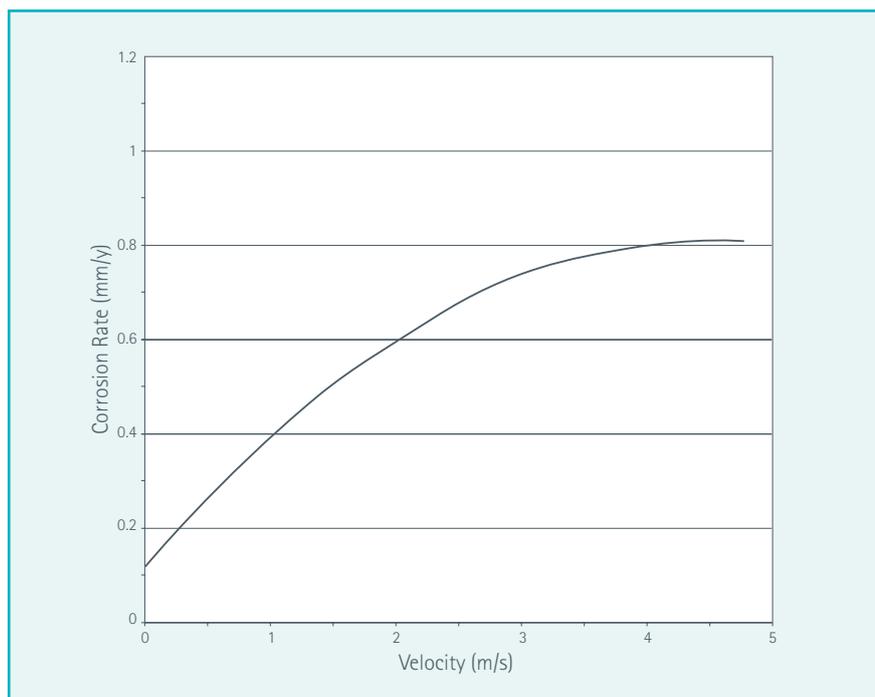


Figure 1 - Effect of velocity on the corrosion rate of carbon steel⁽¹⁾

The corrosion behaviour of metals is largely influenced by oxygen in the seawater as well as flow velocity, temperature, pollution and marine organisms.

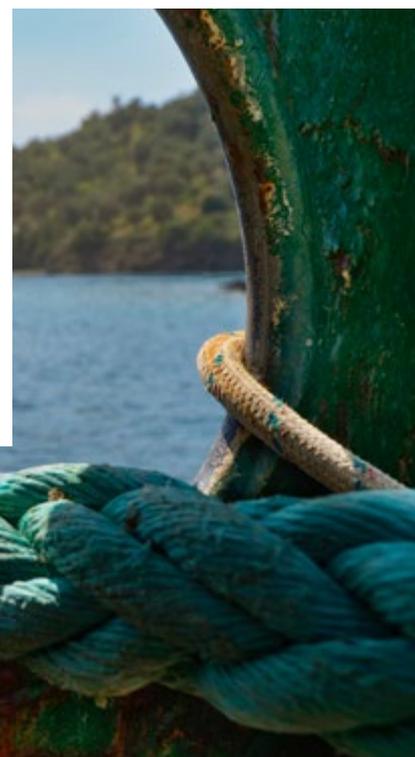




Figure 2 - Crevice corrosion under a washer on 316 stainless steel immersed in sea water for 3 months

The conventional basic austenitic grade used in seawater is type 316 which contains 17%Cr, 12%Ni and 2%Mo. This has a limited resistance to localised corrosion in the presence of crevices. In order to counteract this tendency, higher alloying is necessary. Resistance to both pitting and crevice corrosion can be improved by increasing the chromium, molybdenum, tungsten and nitrogen contents. Development over the last 30 years has seen the emergence of a range of super-stainless steels of austenitic and duplex (austenitic/ferritic) metal structures designed to have much higher resistance to localised corrosion.

A ranking can be made by calculating the Pitting Resistance Equivalent Number (PREN) according to the formula:

$$PREN = \%Cr + 3.3 \times (\%Mo + 0.5\%W) + 16\%N^{(1)}$$

PREN (%Cr + 3.3 x (%Mo + 0.5%W) + 16%N)	
316L	24
Duplex 2205	35
Super-duplex	>41
Super-austenitic	43

Table 1 - PREN values for various stainless steels

The higher the PREN value, the greater the resistance to pitting and crevice corrosion (Table 1). A PREN above 40 is normally considered necessary for resistance to aerated ambient temperature seawater. Alloys with a low PREN, e.g. alloys 316 and duplex alloy 2205, may require cathodic protection if not galvanically protected by other metals in the system.

Where metal and environmental conditions are such that crevice corrosion is a possibility, it is always good practice with stainless steels to design out crevices e.g. by avoiding threaded connections, sealing tight crevices with welds and making full penetration pipe welds. Alternatively local improvements may be achieved at areas such as flange faces by weld overlaying with more resistant high nickel alloys.



Austenitic Cast Irons

The main alloying addition to cast iron to improve corrosion resistance is nickel, often in conjunction with chromium and/or copper. If sufficient nickel (15-25%⁽¹⁾) is added, then cast irons may become austenitic and their corrosion resistance in seawater is significantly increased over the grey iron alloys. They have general corrosion rates of about 0.02 mm/yr in low flow conditions but this rate increases as the water velocity increases.

The alloys are used for pump casings, often with stainless impellers. Being somewhat more anodic to the stainless gives a beneficial galvanic effect which lessens the pitting in the impeller when the pump is stationary. Austenitic cast iron valves can be used in copper alloy and ferrous seawater systems although the latter is more common.

Copper-based Alloys

Copper alloys have long been used in marine engineering where good resistance to seawater corrosion and biofouling (see later) is required. The alloys can be grouped into coppers, copper-zinc (brasses), copper-tin (bronzes), copper-aluminium (aluminium bronzes), copper-nickels and copper-beryllium. There are important differences between these groups but their general behaviour can be summarised as: low general corrosion rate in quiet seawater i.e. about 0.02 mm/year, with little tendency to pit. They also have useful resistance to flowing seawater, even at moderately high velocities, and are commonly used for piping, heat-exchangers, pumps, valves and propellers.



Figure 3 - Erosion corrosion of 90-10 copper-nickel when exposed to excessive flow rates

On copper alloys, protective surface films form naturally by interaction with the seawater and are more complex than many other alloy systems. Above a certain flow called the breakaway velocity, the films can become damaged leading to a type of corrosion called erosion corrosion (Figure 3). This varies with alloy and there are recognised maximum design flow ranges which are important to operate within. In general, the nickel aluminium bronzes and copper-nickels have the highest velocity tolerances and are somewhat better than the gun metals and tin bronzes which, in turn, are better than the brasses.

The wrought copper-nickel 90-10 and 70-30 alloys are commonly used for seawater condensers, heat exchangers and pipework in naval vessels and merchant shipping. Recommended maximum velocities vary for seawater pipework and depend on diameter. Typically they are around 3.5 m/s for the 90-10 alloy

and 4 m/s for the 70-30 alloy at 100 mm diameter and above (Table 2).

Heat exchangers generally operate to around 2 m/s flow velocity which is normally readily acceptable for both these alloys. High turbulence areas such as tight radius bends, partially throttled valves and localised obstructions need to be avoided. Both alloys have a very high resistance to chloride crevice corrosion, even at high temperatures.

Gun metals (copper-tin-zinc) and aluminium bronzes also have good resistance to erosion corrosion but these alloys are not normally used for heat exchanger tubing. Both groups are however used for components such as pumps and valve bodies. The nickel aluminium bronze alloy is used for propellers as it has excellent resistance to cavitation compared to many other copper-based alloys⁽⁴⁾.

	Piping >DN80 (NPS 3)	Heat exchanger tube
90/10 CuNi	3.0-3.5	2.0-3.0
70/30 CuNi	3.5-4.5	2.5-3.0

Table 2 - Typical safe velocities for copper-nickel tube and pipe⁽³⁾

Nickel Alloys: Nickel-copper Alloys

The main nickel-copper alloys are Alloy 400 (about 65% Ni, 30% Cu) and Alloy K500 which is similar but contains small additions of aluminium and titanium. Alloy K500 can be heat treated to double the strength of Alloy 400 while at the same time retaining the same corrosion resistance. These alloys tend to behave in a similar manner to type 316 stainless steel in terms of localised corrosion although pits, when they do form, tend to be flat and broad unlike the undercut pitting typical of stainless steels. Cathodic protection offered by contact with less noble metals enhances the performance of these alloys. At velocities greater than 1 m/s, the surface remains passive and good resistance continues up to high flow velocities. The alloys are used for fasteners, shafting and pump and valve components⁽¹⁾.

Nickel Alloys: Nickel-chromium- molybdenum Alloys

Alloys 625, C 276, 22, 686 and 59 have a very high resistance to chloride pitting and crevice corrosion in seawater and this together with high resistance to flowing seawater to over 40 m/s makes them suitable for many applications. They form a very resilient oxide film in much the same way as stainless steels and have a high PREN value. However, they are relatively expensive and are normally restricted to critical applications⁽¹⁾.

Other Metals and Alloys

Zinc

The principal use for zinc is to sacrificially corrode whilst cathodically protecting ship hulls. Galvanising steel offers little advantage immersed in seawater because the zinc products are soluble⁽¹⁾.

Titanium

Titanium and many titanium alloys have very low corrosion rates in static and flowing seawater and are immune to crevice corrosion below at least 70°C. Seawater velocities in excess of 36 m/s can be handled⁽¹⁾.

Aluminium⁽¹⁾

Alloys for seawater service contain either magnesium on its own or as the main alloying element (5000 series), or magnesium and silicon (6000 series). The latter group are slightly less corrosion resistant, but they can be heat treated to improve mechanical properties.

The corrosion resistance of aluminium and its alloys is due to their ability to form a thin but protective oxide layer in the presence of oxygen and/or water. General corrosion rates are overall less than 0.005 mm/yr in seawater but like stainless steels in an aggressive environment, localised corrosion may occur often being associated with the chloride ion.

Special Corrosion Effects

Apart from the effects of flow and general corrosion, there are other corrosion mechanisms that can occur and need consideration. Two more common types are selective phase corrosion and stress corrosion cracking.

Selective Phase Corrosion

Some two phase copper-zinc alloys are prone to selective corrosion in seawater but this is well understood and usually avoidable.



Figure 4 - Dezincification in 60-40 brass valve stem

Such corrosion of the high zinc component in the alloy leaves a network of copper. The rate of attack can be severe, for example 20 mm/yr in 60-40 brass, and as the remaining copper deposit is porous, leakage may occur. This type of corrosion is called dezincification⁽²⁾, Figure 4, and a similar effect is found in aluminium bronze (dealuminification)⁽⁴⁾.

Naval brass, a duplex alloy, containing 1% tin, was specifically developed to improve resistance to dezincification and is often used for tube plates. The addition of about 5% each of nickel and iron renders the duplex 10% aluminium bronze alloy more resistant to dealuminification, although the heat affected zone of welds may be susceptible and post weld heat treatment is necessary.

Single phase brass alloys such as aluminium brass, can be rendered immune to dezincification by the addition of a small amount of arsenic (0.02%) and this alloy has been widely used in heat exchangers.

The high density of inclusions in 303 and 303Se, free machining grades of stainless steel, create numerous galvanic cells in the material⁽¹⁾ and these grades (Figure 5) should not be used in seawater. They can fail rapidly even in contact with aluminium or steel (see galvanic section).

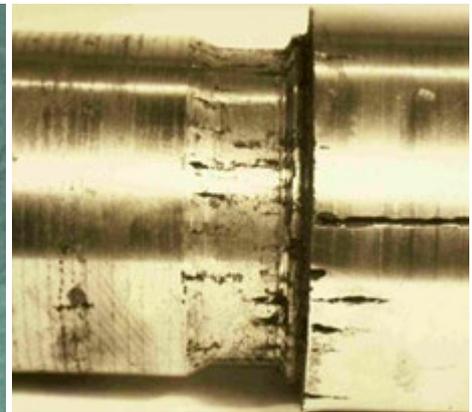


Figure 5 - Corrosion of type 303 stainless steel along manganese sulphide inclusions (Courtesy Rolled Alloys)

For welded components in 316 stainless steel, only low carbon (<0.03%) or stabilised grades should be used to avoid intergranular corrosion at chromium depleted zones in the heat affected zones caused by the precipitation of chromium carbides.

Graphitisation has already been discussed for cast irons. The austenitic cast irons have a much higher resistance to this type of attack⁽¹⁾.

Stress Corrosion Cracking (SCC)⁽¹⁾

Most alloys, when stressed and subjected to corrosion in certain specific environments, can fail through SCC. For this to happen, three conditions have to be fulfilled:

- a susceptible alloy
- a tensile stress of sufficient magnitude
- a specific corrodent.

The elimination of one of these factors will prevent cracking, for example by changing the alloy or removing the stress by a stress relief anneal.

Stainless steel is resistant to chloride SCC in seawater at normal temperatures and cracking is rare. If it occurs, it is usually in areas of high applied or residual stress such as expansion joints, bolting or circumferential welds and/or areas where chlorides can



concentrate by evaporation on a hot metal surface; this can include conditions found in hot climates. Chloride SCC in stainless steel is essentially transgranular, frequently propagating from pits but is unlikely to occur at temperatures below about 50-60°C (Figure 6).

Chloride SCC is primarily related to nickel content, type 300 alloys being the most susceptible. Higher and lower nickel contents have significant improvements. Super-austenitic alloys with 18-25% nickel therefore are significantly more resistant than alloy 316 with 10-12%. Duplex stainless steels, with mixed ferritic and austenitic structures and lower nickel, have a higher resistance to stress corrosion cracking. Ferritic grades with little or no nickel have very high resistance to stress corrosion cracking.

Copper-zinc alloys are susceptible to ammonia stress cracking which may occur in polluted seawaters, whereas copper-tin, copper-nickel and copper-aluminium alloys have high resistance. There have been instances of stress corrosion cracking on austenitic cast irons in warm seawater (>35°C); the solution in this case has been to stress relieve at 650°C. Copper-nickel, high nickel and titanium alloys are essentially immune to chloride SCC in seawater.

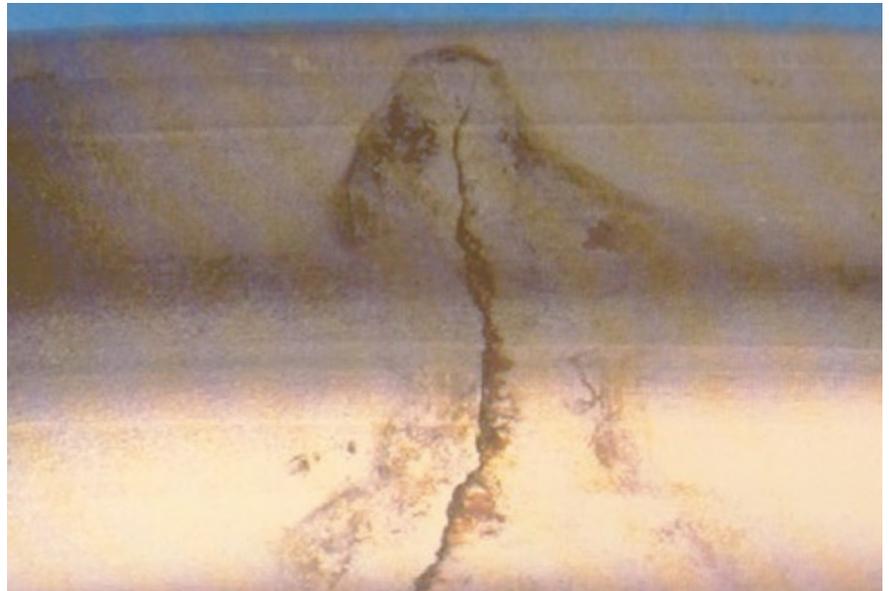


Figure 6 - Stress corrosion cracking of 316 stainless steel

Galvanic Corrosion^(1,5)

It is often necessary to use a number of different materials to construct a seawater system and the galvanic compatibility of these materials must be considered. Galvanic corrosion involves corrosion of the least noble (anodic) alloy within a mixed system, in electrical contact and exposed to an electrolyte - the seawater. The galvanic series (Figure 7) can be used to predict which alloy may corrode when connected to other alloys in seawater. The further apart the alloy potentials are in the series, the more likely the less noble one is to corrode. However, corrosion rate is often more dependent on the galvanic current which can be influenced by relative surface areas. From the galvanic series it will be seen that copper base alloys have similar potentials whereas steel is appreciably anodic. Passive stainless steels are towards the more noble (cathodic) end of the galvanic series and are slightly

more noble than copper alloys and rather more noble than aluminium and steel. Carbon steel and aluminium thus provide cathodic protection to type 316 but copper alloys will not provide significant protection. 316 stainless steel is less noble than the high nickel alloys, titanium and graphite.

Graphite containing gaskets, packing and lubricants have all been responsible for serious galvanic corrosion of stainless steel and other alloys in seawater. Should localised corrosion initiate in a stainless steel, the alloy becomes more active and if the contact metal is then more noble, the local corrosion rate may increase further.

Galvanic corrosion of less resistant metals coupled to titanium may be harmful if conditions lead to the uptake of hydrogen and formation hydrides and subsequent embrittlement. Limiting cathodic potentials in CP systems may be necessary⁽¹⁾.

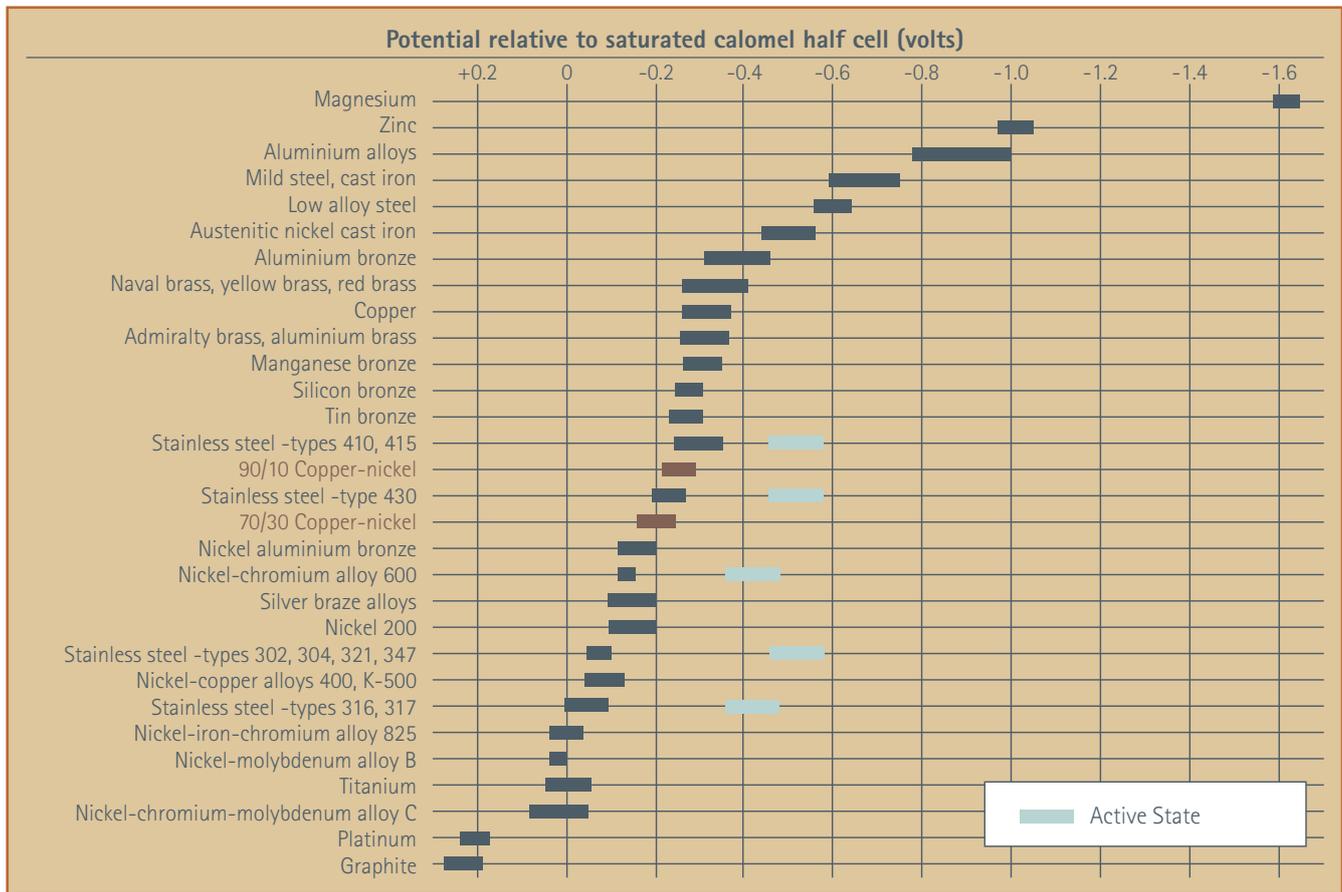


Figure 7 - A galvanic series in seawater⁽²⁾

Problems with galvanic corrosion can usually be avoided by following the rules below:

1. Use materials of similar electrode potential in seawater.
2. Where this is not possible, make the key component of a more noble material; for example, use copper base alloy trim in a cast iron valve body.
3. Ensure that the material of lower potential is present in a much larger area than the more noble material so that the accelerated corrosion of the anode is spread over a large area.
4. Paint the more noble material. This can be beneficial as it reduces the cathode area even when the paint film is incomplete. Imperfect paint film, if only the anode is coated, would intensify the attack at breaks in the paint film.
5. Insulate to prevent galvanic current flowing between the metals, e.g. by insulating sleeves, washers, flange gaskets and spool pieces.

Marine Fouling or Biofouling

Growth of marine plant and animal life on surfaces exposed to seawater can give rise to significant corrosion problems. For example, shell growth in intake systems can become detached and shells carried into a heat exchanger where they generate local turbulence and erosion corrosion. Attachment of hard fouling during low velocities can lead to crevice corrosion in stainless steels but can act as a protective barrier to steel. In severe cases, fouling can cause complete blockage of heat exchangers necessitating shutdown for its removal. Chlorination can

be used to control fouling but in some cases this is impractical or environmentally unacceptable.

Copper and copper alloys are well known for their inherent behaviour towards macro fouling (Figure 8) whereas materials such as plastics, concrete, carbon steel and titanium foul readily. Copper-nickels have a high resistance to macrofouling, showing similar behaviour to copper itself. The 90-10 alloy has found several applications using its combined corrosion and biofouling resistance such as intake screens and sheathing on boats and offshore structures. Best resistance is achieved when the copper alloy is freely exposed and not galvanically coupled to less noble materials in any way.

Stainless steels, nickel-chromium-molybdenum alloys, and austenitic cast irons are all susceptible to fouling.



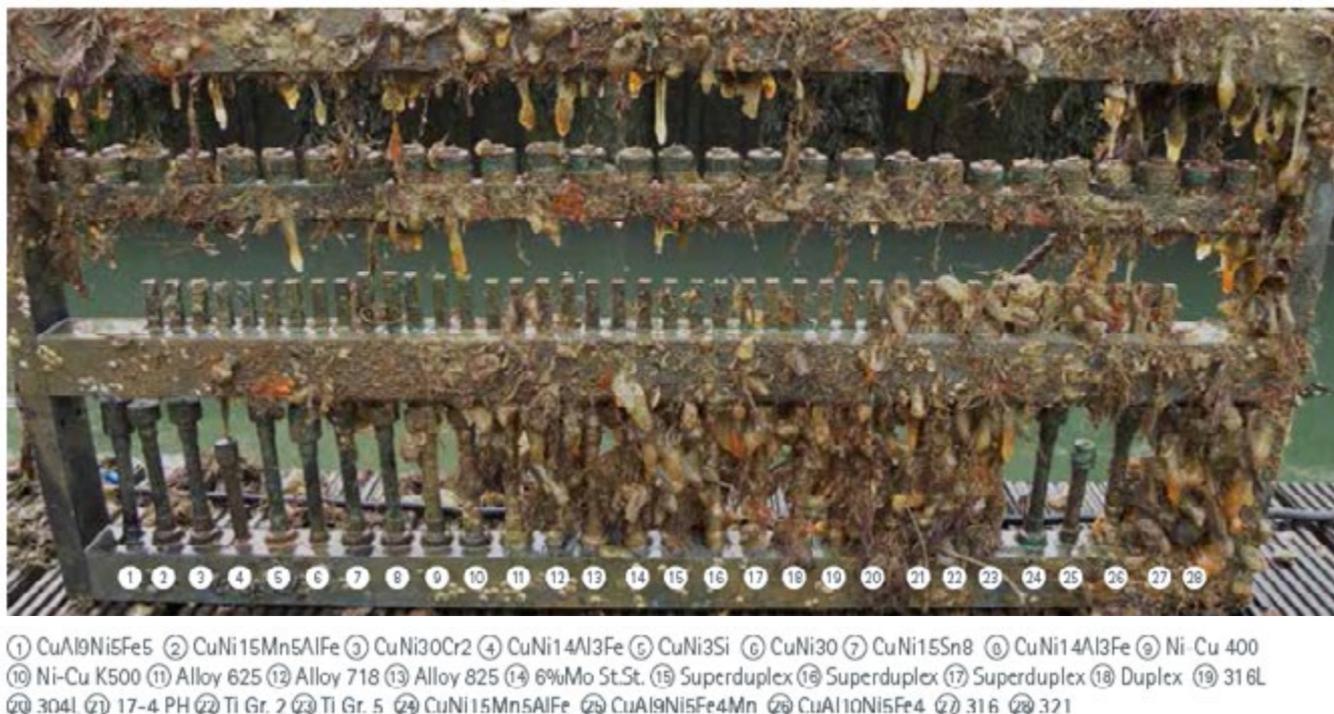


Figure 8 - Macrofouling after 22 months immersion in seawater, Levington Marina Suffolk⁽⁴⁾ (Courtesy Copper Alloys Ltd)

Further Information

Corrosion of metals is a complex subject. Planned regular maintenance or replacement regimes can be a solution to alloys with known service lives and be more economic where the system is accessible and labour is cheap. High reliability materials are the alternative solution and often provide lower life cycle costs than cheaper first cost, less reliable systems.

This article has attempted to highlight some of the considerations but for further knowledge about the subject the following information is suggested:

1. The corrosion performance of metals for the marine environment: a basic guide, EFC/NACE Publication 63. Edited by Carol Powell and Roger Francis, Maney Publishing. 2012
2. Copper Alloys for Marine Environments, CDA Publication 206. 2012
3. Copper Alloys in Seawater. Avoidance of Corrosion. R. Francis, CDA Publication 225. 2016
4. Guide to Nickel Aluminium Bronze for Engineers, CDA Publication 222. 2016
5. Galvanic Corrosion. A Practical Guide for Engineers. R. Francis, NACE International. 2017

Copper Development Association and Nickel Institute also provide in-house workshops on corrosion of metals in seawater. Contact info@copperalliance.org.uk for further information.

Obituary

Mark Tur CEng MIMMM MCIM MBA
1958 –2018

Since the completion of this article one of the authors, Mark Tur, has sadly passed away. Mark joined Copper Development Association in 2007 as a Technical Consultant, with 20 years' experience in the non-ferrous metals industries. His first role was as a metallurgist at Stone Manganese Marine, a heavy foundry specialising in marine propellers, and he completed his time in industry as Managing Director of metal tube producer, Cole and Swallow Materials.

During his 11 years with CDA, he was a fervent supporter of education and professional development initiatives, eager to share his extensive experience with the next generation. Mark developed and delivered many training presentations, workshops and lectures on copper alloys for marine and antimicrobial applications. He connected well with his audiences as he understood both their technical and commercial requirements. Mark was generous with his time and knowledge, had a great sense of humour and was always ready to help. He was a highly respected expert both within the Global Copper Alliance network and among the many professionals he advised on properties, applications and specifications of copper and copper alloys. He loved life in general, was keen on outdoor pursuits and cooking, and had a particular association with the sea, having grown up on the Isle of Wight.

He is survived by his wife, Fiona, and brother, Tim.

The new REG Yacht Code is coming soon...

January 2019 Edition

Part A

Large Yacht Code
(up to 12 passengers)

Part B

Passenger Yacht Code
(up to 36 passengers)

Red Ensign Group Yacht Code



Two decades of experience and consultation across the industry, as well as teamwork from the Red Ensign Group (REG), has led to the creation of a new yacht code which comes into force next year.

The REG Yacht Code was officially launched last November at the Global Superyacht Forum in Amsterdam amidst much interest from the industry. It comes into force on 1 January 2019.

In its new format, the Code pulls together the Large Yacht and Passenger Yacht Codes as part A and B with common annexes – such as for over-side working systems, recreational fire appliances sailing vessels and helicopter landing areas. It keeps the familiar format of the existing Red Ensign Group codes but will be more dynamic to industry change and development.

Although the Codes were largely working successfully, it was clear that refinement was needed and some clarity around the day to day interpretation. However, the equivalences and concepts in the

Code were widely accepted and implemented by industry and it was important for the REG that these fundamental elements were maintained.

The previous Codes were put together to allow designers and surveyors to quickly understand whether what is being proposed meets the intent of the Code. The new Code retains this as its underlying theme.

Getting the new Code ready for its launch was a long and involved process. From the start it was recognised that for it to work, all the Red Ensign Group members needed to be involved and also that it would be essential to involve the wider industry.

The Red Ensign Group is a collaboration of British Ship Registers made up of the United Kingdom, Crown Dependencies (Isle of Man, Guernsey and Jersey) and the UK Overseas Territories (Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Falkland Islands, Gibraltar, Montserrat, St Helena and

the Turks & Caicos Islands).

It was back in 1997 that the first version of the Code was produced by the Maritime & Coastguard Agency with the Passenger Yacht Code published in 2010. Two decades on and the new version reflects all the expertise gained across the intervening years not just from the MCA but right across the Red Ensign Group and into the industry beyond.

The process has involved debate and discussion within the Red Ensign Group and beyond its walls into the wider yacht industry.

Richard Pellew, from the Maritime & Coastguard Agency, is assistant director for the Directorate of Strategy and Corporate Services, responsible for Business Improvement and Assurance. Previously he was Area Operations Manager for survey and inspections and still carries out front line surveys and inspections. In his current role, he is the permanent co-chair of the Red Ensign Group Technical Forum which oversees the





working group that developed the new Code and continues to keep it under review.

‘There’s two decades worth of experience across the Red Ensign Group when it comes to the superyacht industry,’ he said. ‘One of the things that makes the group so strong is that distribution and range of skills and also the wealth of surveyor experience that we are able to tap into.’

‘Although the Cayman Islands coordinated the work, the new Code required the input from the other members of the REG. In addition to the long hours put in by the working group, we spent a considerable amount of time discussing and reviewing it at the Technical Forum, challenging the working group and making sure that the Code would keep yachts flagged with REG members compliant with the international convention requirements, such as SOLAS, MARPOL and STCW.’

‘There is a balance here. It is important that we have effective regulation for the superyacht industry just as we do for everyone who has ships on the British shipping registers of the REG. However, there also needs to be a recognition that the superyacht industry has developed

considerably since the 1997 version of the codes and the new code has to meet the demands of that fast-paced development.

‘The industry needs to be regulated, and indeed a responsible industry demands regulation, but equally we need to be a consistent and reasonable regulator,’ he added.

The new Code was also extensively discussed at last year’s REG Conference held in the Cayman Islands last summer, which gave approval for the Technical Forum to continue its work to get the Code ready for its launch in mid-November 2017.

It was early November when the Forum all but signed off the Code. The Forum is made up of representatives from across the REG’s members (UK, Crown Dependencies and Overseas Territories) and works towards helping the wider REG apply consistent application of technical policy across the British fleet and also developing new technical standards for the maritime industry as a whole.

Richard said: ‘The Forum is where all the experience and expertise of the entire REG really comes to the fore. Everyone from across the REG has fed into it and all want to work

together for the good of the whole and the Yacht Code work showed that at its best.’

The REG developed the new Code to match international conventions and it is expected that Load Line, SOLAS and STCW requirements will be updated in line with those coming from the International Maritime Organization (IMO).

Dick Welsh is director of the Isle of Man Ship Registry. He said: ‘The Red Ensign Group has worked hard to make sure that it represents a quality brand. People recognise that we have high standards and continue to work to maintain them.’

‘With the new Code, it was important that we did two things. One, that we produced something that was fit for purpose for the 21st Century and two, that we went out to everyone who could provide an input to help us get to that point.’

‘This kind of working together shows the successful collaboration which is what gives the REG its strength and quality.’

Part of that work involved extensive consultation across the industry and across the world. There were four working groups set up to look at specific and very separate areas – the Large Yacht Code, the Passenger

Yacht Code, helicopter landing areas and passenger vessels.

The consultation was launched during London International Shipping Week in November 2017 and thrown open to all those working in the sector.

Groups were held across a wide geographic area – from Southampton to Pisa, London to Amsterdam. People who couldn't get to the sessions were still able to take part in the consultation and send in their comments. One consultation alone brought in more than 700 comments as part of that active discussion with those involved with large yachts.

Peter Southgate, is a Principal Consultant with the Cayman Islands Shipping Registry, which is part of the REG. He said it was important to allow innovation while making sure construction was in accordance with the safety principles of the Conventions.

He said: 'We wanted to make the Code more usable and wrote in greater

flexibility so that naval architects, designers and owners can get what they want out of a superyacht. Times have changed and what people want from their superyacht has changed considerably in line with what is possible to include through current design work.

'When we looked at the Code and how it might be revised, we had to make sure we would be regulating for today and not for how yachts were being built when this Code first came out in 1997.'

Peter said that while the REG Yacht Code provides the industry with a new improved tool for the assessment of equivalence, it is not a complete reinvention of the wheel.

'It is a major refinement, rather than a new code,' he added. 'This is important as the industry has been using the Code in its previous formats for many years and has adjusted its shipbuilding practices accordingly.'

'We did not start with a blank page. The Codes in their previous formats

were working well on the whole but we wanted to bring the best of both into one place.'

One of the key parts of creating the new Code was to bring in the many interpretations that had evolved over the years to make sure they now appeared directly within the Code. It means that they no longer have to be discussed on a project by project basis.

Peter Southgate said this was undoubtedly one of the biggest advantages for surveyors.

'Over the years there have been myriad interpretations. When you think about how things were in 1997 to how they are now, it was inevitable that there would have to be interpretations over the years the two separate Codes were in place.

'What we've done with this new Code is – where we can and where it was appropriate – written those interpretations directly into it, together with the circumstances where they can be applied. This





is going to make things more straightforward – previously the known interpretations would have to have been debated for every single project. When time is precious, anything we can do to help reduce hours of surveyor and shipyard time being dedicated to discussing items which were being widely accepted anyway.'

It was also clear that maintaining two separate Codes was creating extra work. Combining the two Codes into one volume even though it has two distinctive parts, gives those who work to update it when it needs it, a less onerous task. The whole Code can be reviewed at the same time.

And it's also had a four-yearly review cycle put in place which will align with the International Maritime Organization's revision cycle for SOLAS and that too will give greater efficiency in the process. The common annexes will also contribute to this potentially easier process to as they can be reviewed without having an impact to the individual Code sections.

This four-year cycle will make sure the Code remains relevant and up to date with international

requirements. Industry will also have time to adapt to changes without having to consistently look to the next yearly edition. The new SOLAS cycle allows for requirements that are deemed to have an urgent safety need to be implemented between Code revisions.

The Large Yacht Steering group continues to meet regularly to discuss new interpretations and possible future improvements and updates. Adam Jackson is Technical Head of Ensign, the specialist Large Yacht Unit of the UK Ship Register. He said it was important to remain actively engaged with those discussions which would shape and influence future decisions around those interpretations.

Adam said: 'This active engagement also means we're able to quickly gain consistent interpretations on the Code when these are required by our clients and others connected with us.'

'The Code is in a practical, usable and flexible format and it's now ideally suited to the innovative nature of the yacht industry. It gives designers the opportunity to show their creativity while keeping to the spirit and intent of the Code.'

Shipyards and designers will be able to assess whether their plans and concepts will meet the intent of the Code at a very early stage. This is because the Code directly reflects equivalences and shows clear goal-driven standards and allows for new arrangements to be more quickly evaluated than would be achievable by prescriptive ones.

Helicopter landing areas, for example, have become increasingly common on board Large Yachts. Recognising this and noting the revision of international standards for Helicopter Landing Areas is a major change in the Code, with the results being published as Annex H. This Annex moves towards international flight deck standards for Large Yachts while allowing for design flexibility.

Adam added: 'Ensign works closely with the Aviation Inspection Bodies who are appointed to certify flight decks on our behalf to make sure a fully certified flight deck can be delivered within the scope of the yacht design.'

'For all of us in the REG, incorporating industry best practice and design features which are unique to the Yacht sector, provides

an avenue for alternative design and arrangements. We can meet owners needs while not budging on what makes us a quality flag for quality owners – our consistently high standards.

'We were all keen to work with builders and owners to achieve the results and – of course – the yachts that they want.'

Peter Southgate agrees: 'This Code was about providing the right parameters for designers while maintaining the right balance of goal-based standards. There had to be prescription of course, but without stifling the work of designers.'

The new REG Code represents a new era, a reflection of the close collaborative work which is consistently created through the work of both individual members, the Technical Forum and the Red Ensign Group's conference.

It combines the expertise from across the REG and will continue to draw on it to keep the Code at

its full potential and to make sure there is technical consistency across the British Ship Registers.

Sir Alan Massey, chief executive of the Maritime & Coastguard Agency who will co-chair this year's 30th anniversary REG Conference, said: 'This Code sets the benchmark for the standards we expect from yacht builders, while giving them the chance to exercise the creativity that will bring some exciting new designs to these vessels.'

'The new Yacht Code is a credit to the Red Ensign Group and testament to the work which makes it such an influential force across the maritime world. The Large Yacht industry is one of the most innovative sectors in the maritime industry, and the Code had to be drafted in a way that would fully support that spirit of innovation.'

'Our constant work to keep the Code in step with the latest expectations of safety and innovation will

reinforce the REG's position as a world leader in yacht certification, with the REG Code as the leading quality standard for the industry.'



For full details about the Red Ensign Group Yacht Code including full PDFs of Parts A & B and the annexes, go to www.redensigngroup.org/reg-yacht-code.aspx





INSPECTION OF THE PROPELLER SHAFT

BY ALAN BROOMFIELD MIIMS

In the course of running a dry dock on the inland water ways and working as a practising small craft surveyor and, having read a large number of reports from other small craft marine surveyors, I cannot remember ever having seen on a report where the surveyor has recommended the withdrawal and hands on inspection of the propeller shaft. Most surveyors seem to wash their hands of it by stating that it was not withdrawn and that no guarantee can be given

of its condition. On a recent survey I carried out, I found the shaft cone to be heavily corroded with some play between the Cutless bearing and shaft. The client was advised that the shaft be withdrawn and inspected. The following attached photographs show the condition of the unit inside the stern tube.

The propeller shaft was of mild steel construction and the corrosion was easy to see in this case along with the free play between the shaft

and bearing. Diagnosis was fairly easy to see and the cone was cut off to ease shaft removal. The shaft was replaced with a new one of monel metal construction

Monel Metal: (Alloy) This is primarily a cupro-nickel metal derived from the smelting of a nickel ore containing copper.





It was first introduced in 1905 by the International Nickel Company and takes its name from the firm's president Ambrose Monel. It contains approximately two thirds of its weight in nickel and a typical analysis is nickel 68.41%, copper 29.14%, iron 1.19%, manganese 1.02%, silicon 0.06%, carbon 0.12% sulphur 0.008%. It has a specific gravity of 8.8 and a coefficient of expansion of 0.000015. It is sufficiently magnetic to hold a hand magnet. It is a tough alloy whose mechanical properties can be improved by cold working but it cannot be heat treated. It has a specific heat of 0.127. Monel is very difficult to machine as it work hardens very quickly. It needs to be turned and worked at slow speeds and low feed rates. It is resistant to corrosion and acids and some alloys can withstand a fire in pure oxygen. It is commonly used in applications with highly corrosive conditions. It is claimed to be between 10 and 15% stronger than

mild steel. It has high oxidation and corrosion resisting properties and is often used in small craft for propeller shafts and keel bolts.

The damage to this shaft above was harder to see than the previous vessel as the wear was within the stern gear. Again, this shaft was of mild steel construction and, although there was play found between the shaft and Cutless bearing, the extent of wear to the shaft was not seen until the shaft was removed. Clearly, if that shaft had been left, it would have sheared off and, life being what it is, the boat would have lost her screw just at the moment she most needed it and a possible court case against a surveyor for not having stated the shaft's condition.

I know that passenger boats under the MCA have to have their propeller shafts withdrawn for survey at no more than two year intervals. Too many times the

marine industry is being led by the cost and inconvenience to the client for withdrawing propeller shafts and rudder stocks for inspection instead of being led by safety. I was able to view the findings and am of the opinion that a similar recommendation should be made regarding the propeller shaft and rudder stocks and tubes on all vessels. Speaking with other professional colleagues, I was advised that damaged shafts such as those seen in the photographs are not uncommon. I now include the following in my reports:

RECOMMENDATION 1:
We would recommend that the tail shaft be drawn and given a close up examination now and at not more than two year intervals thereafter. It should then be dealt with as found necessary.



Lifecord is the new 'smart' kill cord LAUNCHED SPRING 2018

BY **JOHN BARKER**, CORDSAFE LTD

High profile cases leading to loss of life and serious injuries because of the problem of pilots being distracted and forgetting to attach their kill cords, have led one company to find a solution to this vexing issue. Cordsafe has taken kill cord technology to the next level. The Report Magazine sought out John Barker from Cordsafe and asked him to explain the new product development in more detail.

Kill cords and kill switches are fitted to virtually every new outboard engine, open, sports and utility motorboat up to circa 25' in length and have been world wide since the early 1990's. They are designed to cut the engine should the driver of the boat inadvertently become separated from the helm.

It's widely acknowledged that its easy to be distracted while afloat and unfortunately, as a result, it's far too easy to forget to connect the kill cord, especially after performing tasks such as pulling in an anchor or fenders, reeling in a fish, or perhaps a change of pilot at sea when often the preference is leaving the engine ticking over in neutral rather than to turn it

off altogether. A Motorboat & Yachting magazine reader survey confirmed that 83% of those polled admitted that they had forgotten at some point to wear their kill cord. Although RYA powerboat training courses and commercial training briefs cover the importance of wearing kill cords and additionally there are numerous articles from other sources detailing the reasons why this is such an essential safety feature, evidence suggests that it is still the case that the kill cord isn't always being connected to the helmsman despite this education and acceptance of its importance. The current 'passive' kill cord offers nothing to ensure the pilot clips on. The training by these organisations is clearly of fundamental importance, however as the RYA's chief instructor Rachael Andrews explains in one of her instructional videos, "if you see someone not wearing their kill cord, do remind them as it is an easy thing to forget, we hope it's second nature, but we don't always remember".

Firstly, the team involved in this project needed to understand the weaknesses in the current kill cord and look at the circumstances behind kill cord related accidents. The reality is that the current kill cord is virtually bomb proof, as long as it's worn and that is where the problem lies. Should the pilot and occupants of a power boat be thrown from a vessel without the pilot wearing a kill cord the

potentially devastating results caused by the boat circling out of control are well publicised. One particular tragedy occurred in the UK in 2013 where a family fell from their RIB in the Camel estuary. Both parents had taken RYA Powerboat level 2 courses, were responsible boaters and both understood the necessity and had the will to wear their kill cord. However, during a pilot change the family's mother inadvertently forgot to re-connect the kill cord with devastating consequences when the boat hooked in a tight turn and threw the entire family overboard. It was clear to us that this was an inadvertent and forgivably easy mistake to make. There was nothing to warn them that the kill cord wasn't connected. This shocking tragedy initiated the development of a new type of kill cord featuring an intelligent alarm designed to ensure that both the pilot and crew are alerted should the kill cord not be worn, much like a seatbelt warning in a car.

There are wireless alternatives however they haven't been widely adopted. Cost aside, this may be because of uncertainty in cut off range, reliability concerns and the retrospective additional electronics required to be fitted to the boat itself which adds to the list of potential problems for the end user to diagnose should their boat engine fail to start, wireless by its very nature being invisible. Ultimately these systems still

rely on the boat user remembering to ensure that the wireless / proximity device isn't left inadvertently at the helm. The team's research indicated that engine manufacturers, insurance companies and training establishments alike agree that the certainty of a tethered connection between helm and pilot is the most effective and quickest way of cutting the engine should the pilot be thrown from the helm. Lifecord's designers were briefed by specialist marine experts, amongst others, to include product and service supplier to commercial and Ministry of Defence, Landau UK's CEO Ben Metcalfe, also Tony Birr of Century Maritime, ex head of Hampshire Constabulary's Marine Unit and Motorboat & Yachting editor Hugo Andreae. Their diverse wealth of experience between them in areas such as risk mitigation, product expectations and the habits of boaters assisted in ensuring the designers adhered to the most stringent product requirement matrix.

The result of this investment is the release in the Spring of 2018 of a new kill cord named Lifecord by Cordsafe Ltd, manufactured to the highest possible specification in the UK under quality procedures complying with BS EN ISO 9001 and to IP67 waterproofing and dust/particle inhibition intended to meet the exacting standards sought by any official testing house. At the time of writing this article Lifecord is undergoing that accreditation process and is anticipated to become the only accredited kill cord available today worldwide. Lifecord has a GB patent granted, also a US patent pending that has recently received a notice of allowance and various other patents pending in other parts of the world.

Lifecord detects when it's connected to the vessel's kill switch. It acknowledges that connection with a series of beeps. Should the pilot not then connect the other end round their leg, 10 seconds later it alarms, relatively quietly at first just to ensure the pilot and crew are aware that it's yet to be connected to the pilot and





Lifecord has adaptable heads at the vessel end, designed to accommodate virtually every engine type, so whatever boat it's being used with, as long as it has a kill switch, Lifecord should fit it without any modification whatsoever to the vessel itself, it simply replaces the existing kill cord. There are seven clip heads included in the packaging, once fitted the clip head is designed to remain permanently locked in however there is a clip head extraction tool provided should the boat user at some point change their engine. We recommend that a clip head is fitted only once and that should it be replaced then the used one be discarded and a replacement sought from our authorised distributor to keep the original set of seven complete.

allowing time to gather lines or pull in fenders. Then, in further 10 second intervals the alarm becomes increasingly louder to ensure the pilot is reminded to clip on. Lifecord also features orange flashing LEDs that operate simultaneously with the alarm.

A fundamental part of the initial design brief was to ensure Lifecord detected whether it was being worn. Solving this was critical to the success of the product. If it's connected to the kill switch and left dangling from it, even if it's looped back on itself rather than actually worn, it continues to alarm. There is a new type of tension sensor built in to the unique key and clasp connector, designed specifically for this product. Rather than using exposed metallic springs the designers employed repelling magnets and switches, discretely encapsulated within the plastic mould and hidden from exposure to the harsh elements of a marine environment. The magnets repel each other and the key is held in a position within the clasp that causes the audible and visual alarm to sound should it not be tensioned by wearing round the pilot's leg. Clipping on is straightforward, its ergonomic design making it easy to handle even when wearing gloves. It's extremely comfortable to use with the added advantage of being visible to helm and crew alike.

Lifecord is intended to be worn primarily round the pilot's leg, however it also benefits from a secondary option for pilot connection using its separate lifejacket key, designed to be permanently attached to the pilot's lifejacket should this be the pilot's preferred method of clipping on, often seen when used by commercial operators. The lifejacket key has a shorter shaft and reversed magnets, there being no requirement to sense tension. The moment the key enters the clasp it's attracted rather than repelled, holding it neatly at the end of the clasp where the magnetic fields provide a virtual hinge, optimising freedom of movement and silencing the alarm.

Lifecord also offers other improvements over existing kill cords and helps to solve further issues raised recently in a survey of current kill cords and kill switches carried out by the RYA. The survey found that 30% of those polled left their kill cords permanently attached to the vessel's kill switch. This can cause ultra violet damage and other deterioration to the cord itself as it remains exposed to the elements for long periods when the boat is not in use. Also, this habit can damage or weaken the spring in the vessel's kill switch, making it unreliable. Lifecord assists in



remedying both these concerns, the alarm encouraging removal from the kill switch and storage in a locker away from the elements. The product's packaging itself is a PVC/nylon branded drawstring bag likely to be retained by the user for ongoing product storage when not in use and leaving very little of the original packaging to recycle.

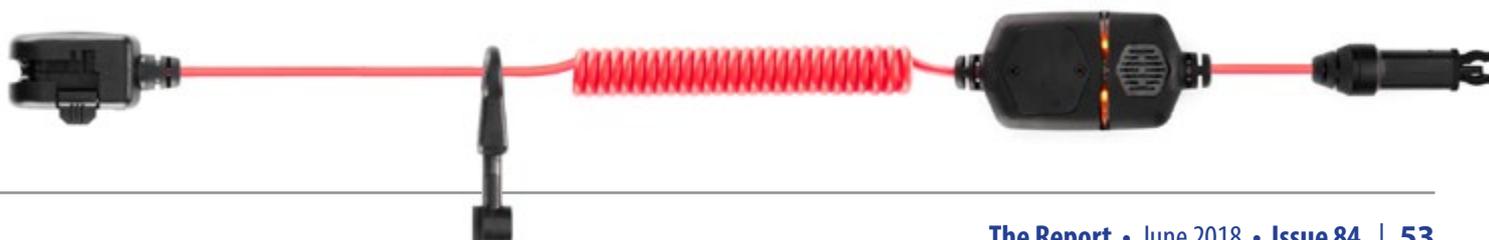
Lifecord has a recommended retail price of £89.95. It is intended as an affordable after market safety product for both commercial and leisure sectors of the marine industry, to include existing boats and new build, with the intention of widely appealing to OEM's and insurance companies alike. Not only does it provide for added benefits over existing kill cords, but the very core of the product fundamentally remains a tethered kill cord offering the preferred solid state connection between pilot and kill switch.

In May 2018 the specialist marine insurance company GJW Direct showed their support for Lifecord and teamed up with Cordsafe to assist in promoting its widespread adoption by offering a 10% insurance premium discount to all new Lifecord purchasers. Jeremy Entwistle from GJW Direct commented, "Promoting safety at sea is important to us. Lifecord is a new product offering powerboat owners a safer alternative to traditional kill cords. If people do forget to connect them, the sensor in the Lifecord device acts as a back-up measure".

Cordsafe has already been approached by a leading lifejacket manufacturer where talks were ongoing at the time of going to press with regards to making their lifejackets 'Lifecord ready' by sewing the lifejacket key into a webbing anchor point during manufacture.

Lifecord has received rave reviews from several publications to date. Powerboat & RIB magazine described Lifecord as a "low cost, simple yet highly effective piece of safety kit". Motorboat & Yachting magazine described the product as 'the best £100 you'll ever spend' and quoting "This is as simple as it is brilliant. In fact its affordable pricing and ability to fit any make and model of boat means it should become the kill cord of choice for every sports boat owner and manufacturer", adding "in time we hope it is as common place as the seat belt alarm in your car".

Lifecord is available to order through its distributor Landau UK - telephone: **+44 (0) 1489 577588** or web site: **<https://www.landauuk.com>** For further product information or any other type of enquiry please visit **<https://www.cordsafe.co.uk>**





IMO adopts ambitious climate change strategy for shipping...

IMS has adopted a progressive strategy with a view to phasing out GHG emissions as the soonest possible time at its recent MEPC meeting in London. Whilst it is too early to understand the full ramifications of this outcome, there is no doubt it is a well-intentioned plan. At this stage it is not clear what practical steps shipowners and the shipping industry will need to take and in what time frame and at what cost to achieve this goal. There will be much debate in the coming months, but for now, set out below is a detailed account of what happened at the meeting.

Nations meeting at the United Nations International Maritime Organization (IMO) in London have adopted an initial strategy on the reduction of greenhouse gas emissions from ships, setting out a vision to reduce GHG emissions from international shipping and phase them out, as soon as possible in this century.

The vision confirms IMO's commitment to reducing GHG emissions from international shipping and, as a matter of urgency, to phasing them out as soon as possible.

More specifically, under the identified "levels of ambition", the initial strategy envisages for the first time a reduction in total GHG emissions from international shipping which, it says, should peak as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008, while, at the same time, pursuing efforts towards phasing them out entirely.

The strategy includes a specific reference to "a pathway of CO₂ emissions reduction consistent with the Paris Agreement temperature goals".

The initial strategy was adopted by IMO's Marine Environment Protection Committee (MEPC), during its 72nd session at IMO Headquarters in London, United Kingdom. The meeting was attended by more than 100 IMO Member States.

The initial strategy represents a framework for Member States, setting out the future vision for international shipping, the levels of ambition to reduce GHG emissions and guiding principles; and includes candidate short-, mid- and long-term further measures

The strategy includes a specific reference to “a pathway of CO₂ emissions reduction consistent with the Paris Agreement temperature goals”.

with possible timelines and their impacts on States. The strategy also identifies barriers and supportive measures including capacity building, technical cooperation and research and development (R&D).

IMO Secretary-General Kitack Lim said the adoption of the strategy was another successful illustration of the renowned IMO spirit of cooperation and would allow future IMO work on climate change to be rooted in a solid basis.

He told delegates, “I encourage you to continue your work through the newly adopted Initial GHG Strategy which is designed as a platform for future actions. I am confident in relying on your ability to relentlessly continue your efforts and develop further actions that will soon contribute to reducing GHG emissions from ships.”

According to the “Roadmap” approved by IMO Member States in 2016, the initial strategy is due to be revised by 2023.

Continuing the momentum of work on this issue, the Committee agreed to hold the fourth Intersessional meeting of the Working Group on Reduction of GHG emissions from ships later in the year. This working group will be tasked with developing a programme of follow-up actions to the Initial Strategy; further considering how to progress reduction of GHG emissions

from ships in order to advise the committee; and reporting to the next session of the MEPC (MEPC 73), which meets 22-26 October 2018.

IMO has already adopted global mandatory measures to address the reduction in GHG emissions from ships. IMO is also executing global technical cooperation projects to support the capacity of States, particularly developing States to implement and support energy efficiency in the shipping sector.

Initial IMO strategy on the reduction of GHG emissions from ships

The initial strategy includes the following:

Vision:

IMO remains committed to reducing GHG emissions from international shipping and, as a matter of urgency, aims to phase them out as soon as possible in this century.

Levels of ambition

The Initial Strategy identifies levels of ambition for the international shipping sector noting that technological innovation and the global introduction of alternative fuels and/or energy sources for international shipping will be integral to achieve the overall ambition. Reviews should take into account updated emission estimates, emissions reduction options for international shipping, and the

reports of the Intergovernmental Panel on Climate Change (IPCC). Levels of ambition directing the Initial Strategy are as follows:

- 1.** carbon intensity of the ship to decline through implementation of further phases of the energy efficiency design index (EEDI) for new ships to review with the aim to strengthen the energy efficiency design requirements for ships with the percentage improvement for each phase to be determined for each ship type, as appropriate;
- 2.** carbon intensity of international shipping to decline to reduce CO₂ emissions per transport work, as an average across international shipping, by at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008; and
- 3.** GHG emissions from international shipping to peak and decline to peak GHG emissions from international shipping as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008 whilst pursuing efforts towards phasing them out as called for in the Vision as a point on a pathway of CO₂ emissions reduction consistent with the Paris Agreement temperature goals.

Background on IMO's contribution to the global efforts to address climate change

IMO's contribution to the global efforts to address climate change features prominently in IMO's Strategic Plan.

In 2011, IMO became the first international body to adopt mandatory energy-efficiency measures for an entire industry sector with a suite of technical and operational requirements for new and existing vessels that entered into force in 2013. By 2025 new ships built will be 30% more energy efficient than those built in 2014.

The mandatory data collection system for fuel oil consumption of ships, which entered into force in March 2018, will provide robust data and information on which future decisions on additional measures, over and above those already adopted, can be made.

The mandatory data collection system is intended to be the first in a three-step approach in which analysis of the data collected will provide the basis for an objective, transparent and inclusive policy debate in the MEPC, under a roadmap (through to 2023) for developing a "Comprehensive IMO strategy on reduction of GHG emissions from ships". The roadmap was agreed in 2016.

Support for implementation of IMO's energy-efficiency measures is provided, in particular, through two major global projects executed by IMO:

- The Global Maritime Energy Efficiency Partnerships Project (GloMEEP Project) is aimed at supporting the uptake and implementation of energy efficiency measures for shipping, thereby reducing greenhouse gas emissions from shipping. The GloMEEP project was launched in 2015 in collaboration with the Global Environment Facility and

the United Nations Development Programme. A "Global Industry Alliance to Support Low Carbon Shipping" (or GIA), launched in 2017 under the auspices of the GloMEEP Project, is identifying and developing solutions that can support overcoming barriers to the uptake of energy efficiency technologies and operational measures in the shipping sector.

- The global maritime technology network (GMN) project, funded by the European Union, has established a network of five Maritime Technology Cooperation Centres (MTCCs) in Africa, Asia, the Caribbean, Latin America and the Pacific. Through collaboration and outreach activities at regional level, the MTCCs will focus their efforts during 2018 and beyond to help countries develop national maritime energy-efficiency policies and measures, promote the uptake of low-carbon technologies and operations in maritime transport and establish voluntary pilot data-collection and reporting systems.





THE POLAR CODE, ONE YEAR ON...

BY MIA BENNETT

Despite its shortcomings, the Code has been a huge step forward in safeguarding the world's oceans writes Mia Bennett.

On January 1, 2017, the International Maritime Organization's (IMO) Polar Code came into effect. The functional, risk-based Code establishes mandatory regulations and standards for vessels operating in ice-covered waters to, in its own words, "Provide for safe ship operation and the protection of the polar environment by addressing risks present in polar waters and not adequately mitigated by other instruments of the Organization."

One year into the Code's implementation, now is a good time to take stock of how its regulations on issues ranging from vessel design to search-and-rescue are playing out.

Although polar shipping may seem to be a 21st-century phenomenon, the Polar Code has been in the making for decades. Lawson Brigham, Professor at the University of Alaska Fairbanks and former Coast Guard officer and Captain of the USCG Polar Sea, one of America's two heavy icebreakers, recalls attending the first meeting of a specially established IMO Outside Working Group in 1993. Over the next five years, the

Canada-led group drafted the first framework for the Code.

Brigham speaks admirably of what it accomplished: "It's truly a seminal advance in governance to get the whole of the maritime states to agree." Yet he feels the Code's value has not yet been adequately appreciated: "The global maritime community, if not the global community, should be satisfied, but I don't get that sense because it's very technical."

Too Technical?

Brigham does not exaggerate the Code's level of technicality. When demonstrating compliance, for instance, ice damage is limited to a longitudinal extent that is "4.5% of the upper ice waterline length if centred forward of the maximum breadth on the upper ice waterline."

To make sense of these regulations, Lloyd's Register (LR), a global engineering firm and maritime classification society, helps shipowners identify compliance gaps between their vessels and Code standards. Alicia Nash, LR's Polar Code Implementation Project Manager, explains that this involves "undertaking a gap analysis comparing the prescriptive

requirements from the Polar Code and the actual vessel's equipment provision by reviewing vessel drawings and the contractual technical specification."

This analysis helps ships set a baseline for Code preparation so they know what additional equipment they might need. LR also facilitates operational assessments ranging from Category C yachts to Category A icebreakers to identify appropriate risk-mitigation measures. The company's Arctic Technology Knowledge Network comprises key approval surveyors around the world who know what's required for a successful initial Polar Code survey.

Once a ship is compliant, the owner can obtain Polar Code certification from a classification society like LR or DNV GL. Oslo-based DNV GL has already issued a number of certificates, and an additional 20 vessels are at different stages of the certification process. More are likely forthcoming since DNV GL has over 4,400 ice-class vessels.

Says Morten Mejlænder-Larsen, Discipline Leader, Arctic Technology & Operation at DNV GL-Maritime, "Many of them



intend to go into polar waters sooner or later,” meaning they will eventually need a Polar Code certificate. For classification societies, this represents new business opportunities.

Search-and-Rescue Challenges

Though more vessels are sailing to the Arctic and Antarctic, the amount of infrastructure onshore is not increasing in step. This is worrisome for search-and-rescue preparedness. In more remote reaches, several days in sub-zero temperatures and freezing water may pass before help arrives.

To prepare for this scenario, the Code mandates that life-saving equipment protect all persons onboard for a minimum of five days – no easy feat. In fact, Mejlænder-Larsen says that having adequate life-saving equipment onboard is the Code’s “main challenge.”

Two search-and-rescue expedition (SARex) tests conducted in April 2016 and 2017 in the Barents Sea off Spitsbergen at 81°N revealed that equipment suppliers still have their work cut out for them. In the first test, after 24 hours the standard Norsafe Miriam 8.5 lifeboat had to be abandoned due to uncomfortably cold temperatures inside. Even after upgrades were made, a Norsafe presentation from last year admitted that “It is still very unlikely you can survive the minimum five days in a raft.”

That hasn’t stopped the company from striving to meet the challenge. Erik Mostert, Norsafe’s Project Manager, Technical - R/D, maintains that when it comes to ensuring a five-day survival time for passengers and crew, “Norsafe has found a clear way to attack this goal with a very detailed risk analysis of all phases of equipment, both stowed and during evacuation, survival and rescue.”

Some of the improvements Norsafe has made involve better ventilation, condensation, and even features that wouldn’t immediately come to mind like a curtain in front of the toilet to provide privacy. Norsafe is tackling other projects that push the envelope even further. Mostert hints, “One customer has even requested a 20-day survival time,” illustrating the extremes of today’s polar shipping industry.

Other critical solutions for safe polar shipping are emerging as well. Fassmer, a German company, is crafting lifeboats that meet the Code’s requirements and is witnessing strong demand from the cruise industry. Jens Hinsch, head of Fassmer’s Boat & Davit Division, says, “These lifeboats will be equipped with additional insulation and a fuel-based heating system, and loose equipment like water portions and food rations will be increased to have enough for at least five days.” In addition, the communication system will have batteries that last over this extended period to guide rescuers to the boat’s position.

Meanwhile, Torbjørn Svensen of Norway’s Hansen Protection AS, a global leader in sea-survival equipment, believes ships should also be equipped with standard survival suits and life jackets for everyone on board.

Ice Radar

In Canada, a country with a long history of polar exploration, Rutter’s state-of-the-art sigma S6 Ice Navigator™ is focused on making sailing through icy waters safer. Although the Code does not require ice radar, it recommends it, and that has driven a lot of industry awareness.

“We’re getting a lot of requests from vessels we probably wouldn’t have had a touch on before,” says Sales Director Stephen Hale. “We’re doing work on ships going through the Arctic and Antarctic, from cruise, oil and gas, governmental ships and research vessels.” Still, he thinks the Code could be improved. For instance, while ice radar is recommended in shallow water, deep water is equally important.

Rutter has also been updating its system to automatically identify open water leads, an advance that will help the increasing number of ships navigating polar waters. “Ice radar in the past has been very much on the visualization side,” Hale explains, “so you can look at it and get an image. But that’s changed over the last year, and it’s now more about detection and



automatic analysis to show where those water leads and ice ridges are to give you more information about safe transit.”

Even as suppliers tweak their equipment, it’s not always clear when they can call it a day. This is because the Code is goal-based: It states what vessels should aim for but doesn’t give details on how to achieve these goals. It also sometimes does not even provide minimum requirements or clarify how compliance will be documented.

Petri Mikola, Senior Vice President, Technical Services at Arctia, the Finnish state-owned operator of the country’s icebreaking fleet, says, “There are some areas still pending, and development work is needed.” Similarly, DNV GL’s Morten notes, “I think it will take some time for IMO to decide and be more specific, and then for the industry and equipment suppliers to be able to supply the right equipment.”

The Human Dimension

Meeting technical standards and supplying equipment is only half the equation in successfully implementing the Code. Brigham, the former Coast Guard officer involved in the early days of its drafting, says that, ultimately, it’s the human dimension that matters: “It’s who’s in the pilot house, what’s the competency of the mariners, and what’s their training in the polar regions – not just simulators.

That’s the real issue for all of us dealing with Arctic navigation, and it’s probably the biggest challenge for implementing and enforcing the Polar Code.”

To deal with the challenge of training people adequately, companies like ABB Marine & Ports offer ice navigator training and Polar Code certification. ABB’s five-day H938 course teaches vessel operators the necessary skills for operating the company’s Azipod® propulsor in ice conditions and how to identify different types of ice and their risks. Samuli Hänninen, who specializes in icebreaking vessels at ABB, says, “At the moment, the majority of our customers are from the oil and gas sector. In addition, we are able to support crews with our ice expertise, for example, with expedition cruise vessels. Current customers have been very satisfied with the workshop and course.”

Phase Two

Although it’s still the early days for the Polar Code, stakeholders and activists are already setting out their goals for a second phase of negotiations. Øystein Jensen, an expert on polar shipping and the Law of the Sea at the Fridtjof Nansen Institute, believes that while the current Code strikes a good balance, it is somewhat watered down in certain areas: “For instance, fishing vessels and vessels less than 50GT do not need to comply with the regulations. Air pollution is not mentioned. Ballast

water management provisions are recommendatory only.”

Andrew Dumbrille, Senior Specialist, Sustainable Shipping at the World Wildlife Fund-Canada, points to heavy fuel oil (prohibited in Antarctic waters but not the Arctic), underwater noise and gray water as issues requiring attention in phase two. He is also hopeful about increased community and Indigenous engagement in the next round of negotiations: “I think the movement is growing and things do look positive for engaging those people who are directly impacted by shipping in the Arctic.”

This would mark yet another advance for the Polar Code which, despite its shortcomings, has proved to be an important innovation in safeguarding the world’s seas.

Polar expert Mia Bennett teaches at the University of Hong Kong.



The future of fuel

BY JOE LO

Environmental regulations are constantly forcing carriers to adjust their fuel strategy – so what will power the container ships of the future? Joe Lo investigates.

Ensuring that container shipping complies with emissions regulations these days is like trying to hike up a mountain in the fog. You sweat away trying to reach your target but then, when you think you've got there, you realise that you haven't. There's always another peak in the distance, and there's always another emissions regulation coming into force in a few years' time, as container shipping is weaned off its reliance on environmentally harmful fossil fuels.

The peak being climbed at the moment is the global sulphur emissions cap of 0.5%, which is coming into force under International Maritime Organization (IMO) regulations in 2020. This follows and complements the 0.1% cap that was introduced in Northern Europe and North America in 2015. All carriers must adapt, and the potential ways in which they can do so are numerous, ranging from the relatively established (liquefied natural gas, or LNG) to the more futuristic (lithium batteries and biofuels).

Arguably the most enthusiastic embracer of LNG to date has been CMA CGM, the world's third biggest carrier. In November 2017, the company announced that its nine new 22,000 teu ships would run mainly on LNG, with only a small amount of marine gas oil

to be used for ignition in the combustion chamber.

In a statement announcing the decision, the company claimed that the use of LNG, instead of heavy fuel oil, would reduce sulphur and fine particle emissions by 99%, emissions of nitrogen oxides (NOx) by 85% and those of carbon dioxide (CO₂) by 25%. The company claimed that this decision went beyond the requirements of the 2020 sulphur cap.



Diane Gilpin suggests biofuels are only a short-term solution

By contrast, Diane Gilpin, CEO of the Smart Green Shipping Alliance (SGSA), suggested that LNG does not go far enough in reducing other harmful emissions. "LNG as a short-term solution for a long-life asset is a risk," she told CM. "LNG addresses the 2020 sulphur regulations, but with carbon and other greenhouse gas emission regulations soon to be applied to shipping (probably in 2023), it doesn't seem to me to be the smartest switch." Gilpin also had concerns over whether LNG would stay at the same price it is currently. "With divestment from fossil fuels gathering momentum around the world," she said, "LNG is a big risk so far as fuel supply and cost predictability are concerned."

Maersk Line also has concerns about the economic viability of LNG. A spokesperson told CM: "LNG-powered vessels are likely to be the next leap forward in terms of engine technology. So far we have not found economically viable LNG designs for our new-buildings (latest orders placed in Q2 2015), but we are continuously working with LNG suppliers and yards to find ways to create a business case for moving into more LNG-powered vessels, and would welcome constructive partners to share development costs."



Louis Notley is an advocate of biofuels

An alternative to LNG is the use of biofuels – fuels made from dead plants or animals. Louis Notley is a former logistics specialist with the UK's Royal Navy and a former COO at a biofuels manufacturer, and is now a consultant with Nisomar. He told CM that pure biodiesel officially gives an 85% reduction in CO2 emissions compared with regular mineral diesel. In addition, burning biofuels produces no sulphur. Estimates of the reductions in NOx emissions offered by biofuels vary wildly – between 0% and 98%, depending on which study you choose to believe. In terms of cost, Notley admitted that biofuels are more expensive to produce than mineral diesel. While they are subsidised as road fuel in some countries, these subsidies are controversial and do not apply to international shipping. However, he said, it is possible to manufacture cheaper biofuel from lower-grade feedstock, which would help make biofuels more competitive against marine gas oil.

Asked whether biofuel is more suitable for new-builds or for retrofitting, Notley said: "It is very viable for existing ships and is already being used in a number of commercial applications. I have not trialled biofuel on a large marine two-stroke engine, but

there are lessons to be learned here from road haulage and power generation, where most existing engines can run on biofuel with little or no modification."

He added: "For ships, there are implications for fuel storage and handling, as biofuels are by their nature hydroscopic [i.e. they absorb water], so they need to be kept dry. Above all, biofuels are a great intermediate step for heavy haulage, from 'dirty diesel' to replacement technologies like fuel cells or battery/electric, enabling immediate and significant reductions in emissions by adopting a percentage blend early on."

Going green, saving money

When the industry talks of fuel economics, the conversation usually focuses on minimising costs. However, a recent announcement suggests that alternative fuel use could also have an influence on revenue, as shippers are given the option to go green. In December 2017, DHL Global Forwarding signed an agreement with the GoodShipping programme, committing itself to offering customers a choice of transporting their goods on container ships that use "waste-based" biofuels.

These are biofuels made from materials that do not compete with food production. This negates one ethical criticism of biofuels, which is that they divert food away from hungry mouths and into engines. Whatever the ethical rights and wrongs of this debate, the controversy has continued to affect the level of subsidies that go into biofuels around the world and therefore the extent to which they are affordable.

On top of this, according to Gilpin, the growing need for both clean fuel and more food to feed a growing global population is likely to push biofuel prices up. "Biofuels have good potential," she said, "but they are subject

to some challenging supply and demand constraints. All sectors will need them in a decarbonised future, and there's not enough land to grow sufficient food for the global population and supply an alternative to fossil fuels."

Another possible alternative to burning fuel is to power ships with lithium batteries. Such batteries are already powering cruise liners, ferries and even a cargo ship that carries coal on the Pearl River in China. However, while this may be a good solution for some types of shipping, it is particularly unsuitable for long-haul container ships. The first reason for this is that container vessels travel much longer distances than most ferries, cruise liners and other cargo ships. Therefore, they would need a much larger battery capacity.



Russell Edson pointed out that battery capacity is a problem

According to Russell Edson, a partner at intellectual property firm Withers & Rogers: "Wider take-up of electric propulsion systems in the shipping sector is being held back due to limitations in battery capacity. This means that all-electric vessels would not currently be able to undertake

longer trips, as batteries can't economically carry enough power for the whole journey."

However, he said that innovation to improve battery capacity is taking place and that increased demand for electric vehicles of all kinds will ensure that this innovation continues. "This makes the possibility of all-electric cargo vessels increasingly likely in years to come, as those technologies increase the total amount of energy that on-board batteries can carry," he added.

Anastasia Papadopoulou, a ship finance lawyer at Keystone Law, is similarly optimistic, at least when it comes to certain types of container ship. "Electric-powered container ships could work well for shorter and more predictable routes," she said, "for example in liner container shipping, where vessels follow a scheduled service on fixed short routes. Another feasible category would be feeder container ships operating a limited inland service and also those dedicated to trading in specific areas."

As well as battery capacity, however, another obstacle is that the battery would need to be charged up in port.

This is not a problem for vessels that shuttle between two or three fixed points, such as the electrically powered ferry which makes regular short trips across the harbour in the Taiwanese city of Kaohsiung. However, it would be a problem for a long-haul container shipping service, which could call at a dozen ports across the world, each of which would need its own battery-charging infrastructure.

Even if all these ports did develop infrastructure of this nature, doubts remain as to whether electric bunkering could be quick and efficient enough. According to Papadopoulou: "Perhaps a more appropriate solution would be solar-powered batteries or a hybrid solution involving electric bunkering in less congested ports."



Anastasia Papadopoulou, a ship finance lawyer at Keystone Law, is similarly optimistic, at least when it comes to certain types of container ship

A spokesperson for Maersk Line concluded: "Battery-driven ocean-going container vessels are very far away; their potential commercial viability would depend on very radical improvements in energy density and price per kWh. With today's levels, a large container vessel powered by batteries would have around 80% of its cargo capacity taken up by batteries for a voyage between Singapore and Rotterdam."

The spokesperson added: "The technology is likely to first become viable for smaller container vessels deployed within feeder and short-sea trades, where port calls are frequent and thus allow for frequent recharging options. However, for these vessels too the technology is far from being able to compete with our current engine propulsion set-ups."

Short term solutions

In the short and medium terms, it seems more likely that container ships will use electric power in a limited way. In May 2016 Maersk announced that it was fitting 11 of its Triple E-class container ships with General Electric's Power Take Off/Power Take In (PTO/PTI) technology.

This consists of a shaft generator motor installed between the ship's main engine and its propeller, which acts as either a generator or a booster to generate electricity. It harnesses the mechanical energy of the vessel's drive shaft to convert it into electrical energy.

This excess energy is then directed to onboard systems when it is required, which reduces the need to burn fuel to power the systems.

In the short term, other carriers CM spoke to were either not ready or understandably unwilling to publicly disclose their strategies for meeting the 2020 sulphur cap.

A spokesperson for Hapag-Lloyd said that the company was working flat out to prepare for the changes and would come up with a solution soon, but that it was too early to comment in detail.

A spokesperson for the new Ocean Network Express (ONE) network responded in a similar manner: "At present, ONE's immediate focus is on the safe launch of the company in April 2018. ONE's latest new-builds are 'LNG-ready', but at this stage we are yet to make a decision on a final energy strategy in line with the 2020 IMO regulation."

This article first appeared in Container Management magazine's January/February 2018 edition and is reprinted with their kind permission.

Web site: <http://container-mag.com>

DNV GL approves PSM analogue programmable transmitters

PSM Instrumentation has been awarded Marine Type Approval from DNV GL for its new Analogue Pressure Transmitters (APT), which can offer a cost-effective alternative to alternative tank level transmitters.



These APT transmitters, which are suitable for marine, industrial and hazardous area applications, have demonstrated that they are fit for purpose and meet the required environment and performance criteria during the Approval process.

“We believe that our APTs offer a new alternative tank level transmitter solution and are pleased that they’ve been recognised as compliant to give customers further confidence in our product range,” said Mark Jones, sales and marketing manager, PSM Instrumentation.

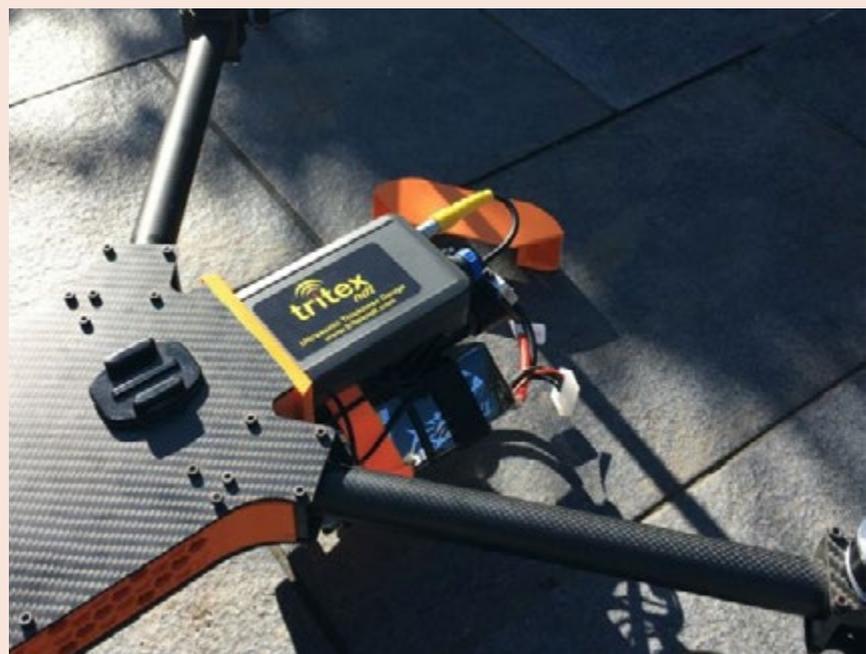
Thickness gauges for drones by Tritex NDT

A drone-mounted thickness gauge has been developed by Dorchester-based, Tritex NDT.

The Multigauge 6000 has a single probe on a flexible head. This projects forward of the drone and can take readings on curved or complex surfaces “so you don’t have to come in at exactly 90 degrees”, said Jon Sharland of Tritex NDT. This will then transmit real-time measurements “up to a line of sight distance of 500 metres” said Sharland, using an integrated RF transmitter on the gauge to a ‘dongle-type’ transceiver that simply plugs into a laptop’s USB port.

Usefully the readings are displayed and stored in a grid or string format, easily read by Excel or other programmes, making analysis fairly straightforward.

For Jon Sharland, it’s the logical extension of the company’s already established technologies. The multi-echo device has already been proven on the company’s ROV mounted kit, using an Automatic Measurement Verification System (AMVS) the gauge will ignore painted coatings up to 20mm thick and give true readings even on the most heavily corroded metals.



NEW PRODUCTS

Life Cell

Life Cell, which stores essential safety gear together in a buoyant, high-visibility floating case for quick and easy access in emergencies, has received a 2018 Top Product Award from Boating Industry magazine.

Designed by a survivor of a rapid sinking off the coast of Sydney, Australia, Life Cell is redefining how safety equipment is stored on boats and creating a new category of safety equipment in an attempt to save lives. It is like combining a life ring and a ditch kit in one device, two items that have undergone little innovation in recent history.

"Life Cell has had significant success in Australia since it was launched in 2015 and we are pleased that we are starting to get the same traction in the United States," said Life Cell Marine Safety CEO Jenny Aiken.

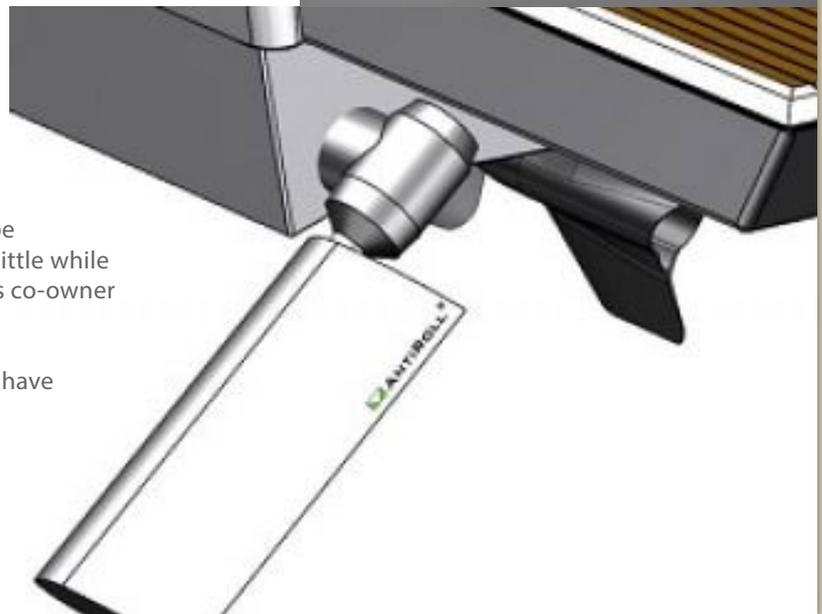


DMS Holland to start developing stabilisers for fast-planing yachts

Following the successful development and subsequent launch to market of the electric roll damping system for yachts up to 30 metres, the MagnusMaster, DMS Holland has now started the development of a roll damping system for fast-planing yachts up to 30 metres.

This new AntiRoll damping system will be produced as a standard-series stabiliser. Until now, AntiRoll has only been developed as a 'custom build' for super and mega yachts. DMS Holland will be taking this patented dual-axis fin stabiliser and using it to form the basis for their new system. The fundamental concept behind AntiRoll remains the same, namely high-aspect fins that rotate whilst sailing and flap whilst the yacht is at anchor. It is stabilisation at fast speed that will form the extra addition and make it a 3-in-1 stabiliser. "How this will actually be achieved we are keeping to ourselves for a little while longer yet," says Patrick Noor, DMS Holland's co-owner responsible for sales & marketing.

Various international shipyards and dealers have already shown interest in the system and have indicated a willingness to support the innovation in wanting to test the system for one of their models. One of these so-called 'Launching Customers' is Jonkers Yachts.





Portable testing device for fuel sulfur content launched

Parker Kittiwake has launched the X-Ray Fluorescence Analyzer (XRF), a portable testing device that, among other parameters, measures the sulfur content in fuel.

The XRF provides an accurate indication of sulfur content through the analysis of a small fuel sample in less than three minutes. This gives both shipowners and Port State Control (PSC) the ability to conduct laboratory-standard testing onsite before non-compliant fuel is bunkered and before a vessel carrying non-compliant fuel leaves port.

For details see <http://www.kittiwake.com>

Enteron Sewage System launched by Mactra Marine

Mactra Marine Equipment has introduced the enteron sewage treatment system to the inland waterways market. The plant is said to be the smallest certified fully-biological plant for yachts and houseboats, approved by IMO, MARPOL and MED.

"The operation of our mini sewage treatment plant on board yachts and houseboats ensures complete independence from land-based waste management systems," explained Mactra's Jim MacDonald.

"The system consists of three chambers, an aerobic, anaerobic and another aerobic one. The pumps automatically come on twice a day for 15 seconds to pump the waste through with a bacteria-free liquid produced.

"It takes away the need to go to a pump-out station and is perfectly safe to be released into the waterway."

The system is based on a human stomach and gut where bacteria are needed to aid digestion.

Waste is flushed into the first tank; solid particles settle and are treated with a macerator pump.

More details at <http://www.mactramarine.co.uk>



NEW PRODUCTS



Class approval for the world's lightest carbon davits

The Rogers 10t Twin Lift Carbon Davits are thought to be the world's largest carbon fibre davits ever built and its makers claim weigh 75% less than traditional solutions. The driving force within each davit structure is a highly innovative, bespoke marinated stainless steel 5t Captive Winch, which has also been designed and engineered by the in-house Rogers team.

Following 2 years of intensive design and rigorous testing, Rogers Advanced Composites (RAC), in conjunction with Rogers Yacht Design (RYD), are now delighted to be able to announce that the davits and winch have been DNV-GL certified to a Safe Working Load (SWL) of 5 tonnes each and a SWL of 10 tonnes in a twin installation. This latest certification adds to RAC's certification for ISO 9001:2015, JOSCAR and endorses RAC's commitment to international standards of the highest quality and safety.

A surveyor from DNV-GL commented, "The RAC davits had to lift 2.2 times the safe working load of 5 tonnes in order to be approved, which meant that each davit actually lifted 11 tonnes on test and through a range of angles."

While these davits are popular for superyacht owners who are looking for larger/heavier tenders or to simply increase stability they have also found buyers for whom weight is equally important in military and commercial marine vessels.

Possible new cure for diesel bug

A new product that removes water from the bottom of diesel tanks is expected to end all diesel bug problems.

The Diesel Dipper is a self-contained system independent of the engine. Fitted with a 12-volt pump, it is designed to suck water from the floor/bottom of a fuel tank below the fuel suction and by doing so, makers Marine 16 say it eliminates or prevents diesel bug and engine failures.

Marine 16 said: "Water and sludge lying on the bottom of the tank is drawn up into a 'tank separator' where it separates from the diesel and collects on the bottom. This accumulated water and sludge is then periodically drained off into a container."

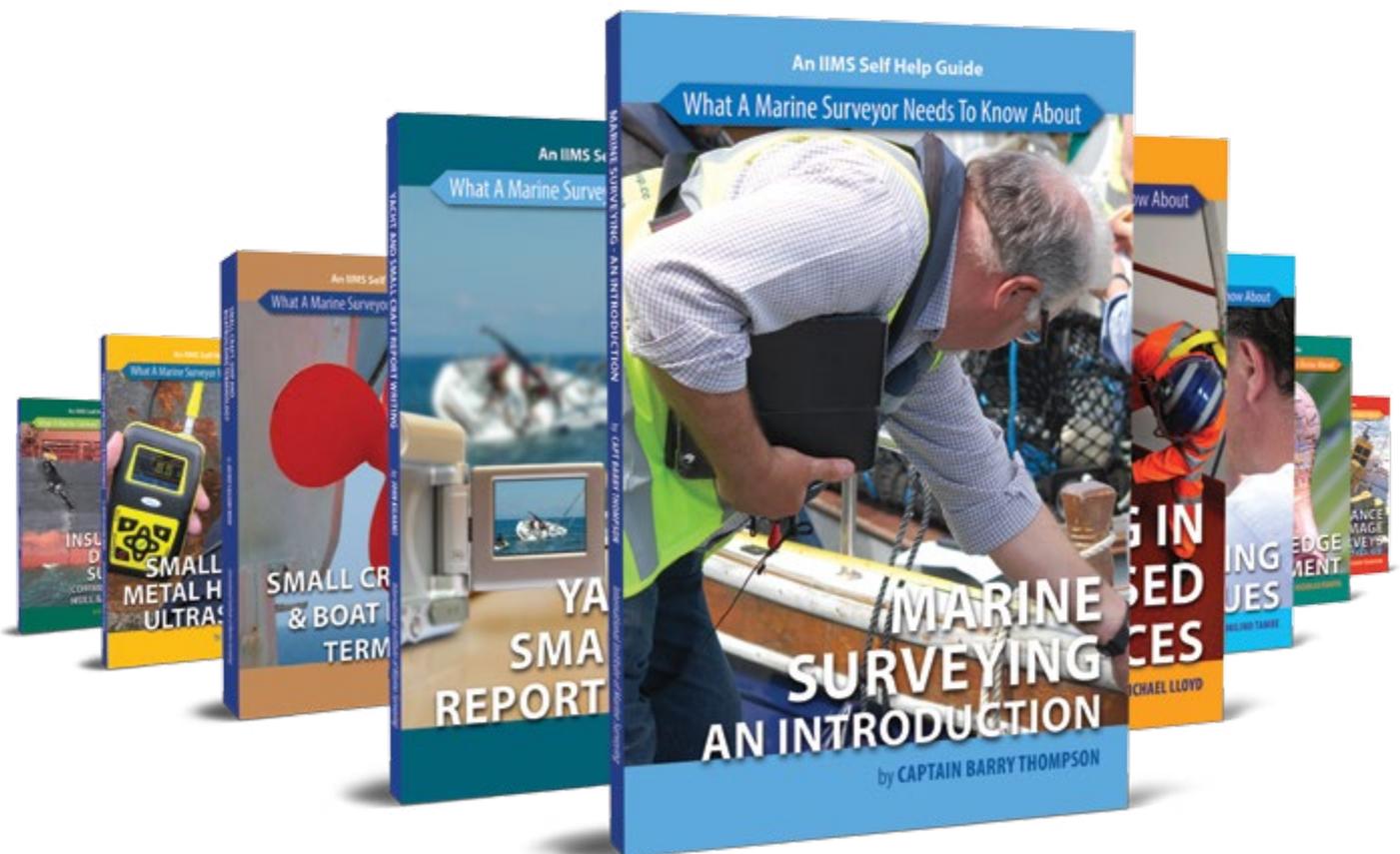
The clean diesel exits the top of the separator and flows through a 40-micron washable stainless steel filter before returning to the top of the tank via a tee in the fuel return line.





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THE DEADLINE FOR THE REDUCTION OF GLOBAL SULPHUR CONTENT EMISSIONS IS FAST APPROACHING

On 16 April 2018 the European Commission published a report on implementation and compliance with the sulphur standards for marine fuels set out in Directive (EU) 2016/802 relating to a reduction in the sulphur content of certain liquid fuels. The report describes the progress made by Member States and the maritime industry in implementing EU rules under the Directive that led to a significant drop of air pollution from sulphur oxides emitted from ships.

The report follows the approval on 13 April 2018 by the International Maritime Organisation (IMO) of draft amendments to the International Convention for the Prevention of Pollution from Ships (MARPOL Convention) Annex VI prohibiting the carriage of fuel oil noncompliant with the sulphur content limit. These amendments aim at ensuring the implementation of the 0.50% sulphur limit in marine fuels as of 2020.

IIMS set out to interview and get the views from marine giant, Wärtsilä, one of the leading players who have a special and keen interest in this new regulation.



QUESTION 1.

Starting with a general overview - given that the deadline for the reduction of global sulphur content emissions of no more than 0.50% m/m against the current limit of 3.50% is due to come into force in 2020 (just 18 months), is the marine industry sleep walking into a major problem and setting itself up to fail?

There are three alternatives for the industry to comply with the new regulations, 1) Install a scrubber, 2) switch over to run on low sulphur fuels, and 3) Convert vessels to run on LNG. From our perspective, we experience that owners are increasingly realizing that installing a scrubber is economically the most sensible option, but many owners have postponed their investment decisions to a late stage. The strength of the scrubber option as primary mean of compliance is primarily driven by a high expected spread in fuel prices for HFO versus MGO. However, we do believe that not all owners will be able to secure yard slots for retrofitting the vessels before the 2020 deadline. Due to the limited availability of LNG, we believe that

the conversion to LNG will be less attractive as a mean for compliance compared to scrubbers. When it comes to the availability of MGO, we believe that bunker suppliers and refiners are in a better position to comment on this than Wärtsilä.

QUESTION 2.

In Wärtsilä's opinion, how big an issue is the new global sulphur cap regulation for the shipping industry to cope with and implement; what are the key challenges and have you any estimate as to how many vessels are affected?

We believe that this will be a rather big issue for the industry to cope with and the primary concern among ship-owners is the availability of compliant fuel and the expected high fuel spread between MGO and HFO. Moreover, we experience that owners are increasingly concerned about securing slots from both yards and equipment suppliers for retrofitting scrubbers prior that the new regulation comes into force. We believe that only a minority of the world's fleet of approximately 60,000 vessels will have installed a scrubber before

the deadline, but we believe that many owners will still opt to do so after the deadline due to the strong economic incentive for owners to install a scrubber.

QUESTION 3.

The estimates of the cost to the shipping industry we have seen vary wildly from \$24 billion to \$60 billion. Is there a concern or suspicion that third world operators/shipowners in particular will struggle financially to make the investments required to bring their fleets into line in time?

Yes, we believe that there is a concern in the industry related to this, and we see that owners across all vessel segments and markets are worried about the financial consequence of the new regulations.

QUESTION 4.

Why can't the fuel suppliers just develop low sulphur fuels to ease the burden?

We believe that bunker suppliers and refiners are in a better position to comment on this than Wärtsilä.



QUESTION 5.

How well advanced is Wärtsilä's development of exhaust gas cleaning systems and do they help to meet the new regulation?

The roots of the Wärtsilä EGC systems go back more than 50 years to when we developed the first Inert Gas Systems for use on tankers. In the early 1990's we installed the first prototype exhaust gas scrubber on a tanker owned by Shell. However at that time there were no regulatory requirements, and hence no market demand for the product. Once the IMO regulations were in place, we were the first company to take commercial contracts, and have retained a leading position in the market since then, both in terms of the overall market areas and within various vessel segments.

Ships tend to be custom built and designed to suit a particular trade

or set of requirements from the owner. To ensure that we have a suitable solution for all, we have developed what we believe is the widest portfolio in the industry, in terms of scrubber designs, (In-Line and Venturi-type), scrubber system types (Open-loop, closed-loop and Hybrids) and sizes (From 0,5 to 70MW capacity) and all our EGC systems meet the new regulation requirements.

QUESTION 6.

And what about Wärtsilä's progress in offering gas and dual-fuel engine technologies? How advanced are you and where does LNG, for example, fit into the mix and how important could it become?

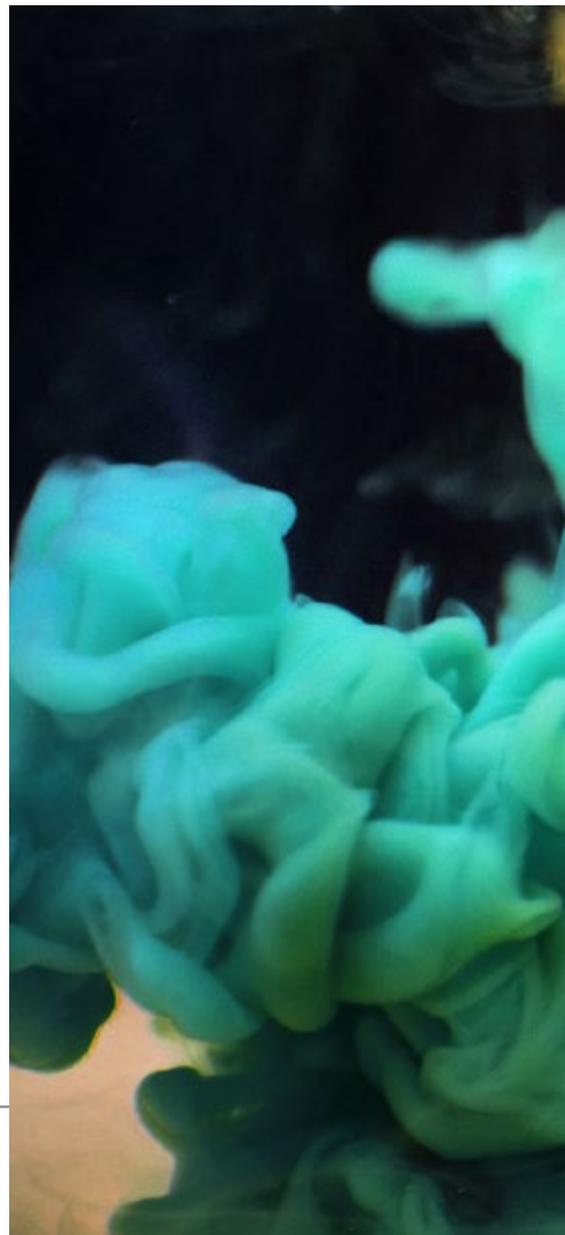
It is since fifteen years that Wärtsilä powered the first LNG-as-fuel applications in the marine industry. Since then the market

has always been expanding and so did Wärtsilä's references. The traditional liquid fuels still represent a big portion of the business but, for understanding the order of magnitude in importance, about 50% of Wärtsilä marine engines in the order book are Dual-Fuel engines.

QUESTION 7.

What are the likely key technological changes that a ship surveyor needs to be aware of as we move towards the sulphur cap?

When it comes to scrubbers, the system is built up mainly of components that are familiar to both operators and surveyors. But there is more reliance on monitoring systems. These monitoring systems are commonly used on land, but are relatively new in a marine setting.



QUESTION 8.

How will a surveyor or ship inspector need to retrain (if at all) and what new skills or knowledge will they need to acquire to ensure they understand technologies that are emerging to fit the new regulations?

With regards to scrubbers, verifying compliance is straight forward in that there is a continuous monitoring of either the direct emissions, or of the systems operating parameters. Provided that these are within the boundaries set by the regulations, the vessel is compliant. These operating data are logged in a tamper-proof data-logger.

QUESTION 9.

Who should police the new regulations in your opinion and how best might this be done?

It is up to the industry and relevant authorities to agree how the new regulations should be complied with.



QUESTION 10.

Where does Wärtsilä see the key opportunities, both from your business perspective and also for the wider shipping industry of the introduction of the global sulphur cap?

Wärtsilä sees strong business opportunities with the introduction of the global sulphur cap, both related to our scrubber and LNG technology, as we are a leading player in both areas. In a wider perspective, we welcome regulations that will further strengthen the position for the shipping industry as the world's most environmentally friendly means of transportation.



WE WELCOME REGULATIONS THAT WILL FURTHER STRENGTHEN THE POSITION FOR THE SHIPPING INDUSTRY AS THE WORLD'S MOST ENVIRONMENTALLY FRIENDLY MEANS OF TRANSPORTATION.

CHAPTER 2 FIFTY SHADES OF LAW

WHAT CONSTITUTES A CIRCUMSTANCE (OCCURRENCE) THAT MAY GIVE RISE TO A CLAIM AND WHEN SHOULD YOU REPORT IT TO INSURERS

What are the elements that identify a circumstance that may give rise to a claim and are notifiable to insurers? Well there are several and below is a summary of these and some tips on what you should report and when to insurers.

Two key elements for a notifiable circumstance

- 1 An insured must be subjectively aware of the circumstance, as illustrated in the important English Court of Appeal decision of *Kidsons v Lloyds' Underwriters* (2008) ("Kidsons").
- 2 The circumstance must objectively be material in that it is likely to, or may, give rise to a claim (subject to the wording).

Awareness can be tricky to identify:

- > If a junior employee of a company receives a letter of complaint from a client but tells no-one about it generally their knowledge is unlikely to be attributed to the insured company for the purposes of an insurance Policy subject to the Policy wording.
- > In contrast knowledge by a board of directors and perhaps knowledge of one director alone may be sufficient.
- > Any in between situation is tricky and a question of awareness is fact sensitive.

Awareness can arise from internal or external factors:

- > External example: a letter of complaint from a third party.
- > Internal example: *Thorman v New Hampshire* (1987), a case concerning an insured who was an architect:

'A typical example would be a belated realisation, based upon a study of professional journals, that perhaps he had specified inadequate foundations for a building which he had designed and which had already been erected.'

Analyses of: "Likelihood of circumstance giving rise to a claim" and "may give rise to a claim"

The Policy will usually stipulate that the circumstance to be notified is one which is "likely to" or "may" give rise to a claim. The differences in the wording can be significant.

'Likely' has deemed to mean:

- > at least 50% likelihood of a claim occurring (*Layher v Lowe* (1996) CA);
- > that it is "probable" or "more likely than not" (*Laker Vent v Templeton* (2009) CA).

'May' means:

- > 'at least possible that a claim will result' (*Rothschild v Collyear* (1998) QB)
- > 'a real as opposed to a fanciful risk of underwriters having to indemnify insured' (*Aspen v Pectel* (2009) QB)

Objective approach to a question of whether a circumstance is something which "might" or is "likely" to lead to a claim (*Kidsons*).

Points To Consider

- > Is it too vague or remote to be reasonably capable of being regarded as a fact or situation which might give rise to a claim
- > Would any reasonable person in the insured's position recognise a real risk of a claim from the facts
- > Would different people possessed of same knowledge reasonably form different views as to whether a claim is a real possibility as distinct from a remote risk

What information should you provide to an insurer:

Unless the policy wording says something different, there is no requirement at the time of notification to identify:

- > A specific transaction;
- > A possible claimant; or
- > A potential issue with each transaction

Checklist for consideration of circumstances

1. Form of notification of a circumstance required under a policy of insurance?
2. To whom does a notification have to be made?
3. Is the insured "aware" of the matters giving rise to circumstance at the time of notification that may give rise to a claim? Is it an internal or external trigger?
4. When did the "awareness" arise, and is it attributable to the insured (as a corporate entity, for example)?
5. Has the insured complied with the notification requirement specified in a Policy e.g. time period? Is the obligation a condition precedent?
6. What is the Policy requirement: "likely to" or "may" give rise to a claim? Does the materiality of the circumstance meet this test?
7. How would a reasonable recipient have interpreted the contents of the notification? Is there certainty?
8. If a claim arises has it arisen out of the circumstance notified? Is there sufficient causal connection?

Condition Precedents Analysed

In the recent case of **Zurich Insurance Plc v Maccaferri Ltd [2016] EWCA Civ 1302** the Court of Appeal was asked to determine the meaning of a condition precedent in an insurance policy which required the insured to notify its insurers "as soon as possible after the occurrence of an event likely to give rise to a claim".

The Court decided that the insured had an obligation to assess the likelihood of a claim being made immediately after any given incident. The insured was not, however, required continuously to assess whether past events may give rise to a claim.

The Facts

- > An engineering firm supplied Spenax guns to a builder's merchant that hired it to a third party building company in 2011.
- > An employee of the building company was injured when a Spenax gun went off accidentally. The insured was informed of the incident but, at that time, there was no indication or allegation that the gun had been faulty, nor that anyone had been seriously injured.

In 2012 the injured employee brought a claim against his employer and the insured was notified that it had been joined as a defendant to the proceedings on 22 July 2013. The insured notified Zurich of the claim on the same day. Zurich denied cover on grounds that the insured had failed to comply with the condition precedent relating to notification.

The court's findings

The Court of Appeal rejected Zurich's interpretation of the condition precedent. If it had been upheld the potential effect would have been to exclude liability for an otherwise valid claim for indemnity.

The Court determined that the phrase "an event likely to give rise to a claim" meant an event with at least a 50% chance of leading to a claim.

The fact that a claim was possible was not enough.

The impact of the words "as soon as possible" were the considered in the context of the drafted clause.

The words "as soon as possible after the occurrence of an event" could, in theory, mean that an insured was under an obligation to continuously assess whether past events were likely to give rise to litigation. The Court would not apply this strained interpretation of the wording unless insurers had spelt it out.

The test applied:

At the time that the event occurred – was it likely (i.e. a likelihood of 50% or more) to give rise to a claim and it was decided that the 'likelihood' of a claim could not be inferred simply from the fact that an accident/event had occurred.

It was found that on the facts of this case, particularly due to the insured's lack of knowledge as to what had happened, there was no such likelihood as at the time of the incident, the insured did not know that anyone had been seriously injured and there was no indication that the gun had been at fault. During the proceedings two of the instructed experts could find nothing wrong with the gun; there were no grounds for Zurich to deny liability.

Factors considered:

1. the insured knew very little of what had happened at the time of the incident;
2. there were limited grounds for alleging that the insured's product was faulty; and significantly
3. the allegation of fault was not even made until a year after proceedings were first issued.

On the facts of this case, the Court found that it would be unreasonable to expect an insured to carry out a "rolling assessment" of whether past events were likely to give rise to a claim.

If you are interested in discussing any of the content of this article we will be pleased to do so as independent insurance intermediary that specialises in arranging insurance for the marine industry.

Karen Brain

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A day in the life of... Ursula Smith MIIMS

Based in Malta, Ursula has been a long-standing member of the Institute and remains one of relatively few female members in a marine sector still dominated by men. But as Ursula reveals in this interview, this fact has not put her off as she has gone on to fulfil a childhood dream of 'playing with boats'.



Q1. Let's start with the inevitable question that others may well have asked. You are a well-respected and successful woman in a sector of the marine industry that is dominated by men. What attracted you to surveying and what was your route into the profession?

Ever since I was a child I have always wanted to play on boats but in those days many doors were closed to women. As I grew up I managed to prise a few open. I trained as a radio officer at the Merchant Navy College, Greenhithe and during my career have undertaken most roles relating to the sea. In 2006 I was made redundant from two jobs on the same day and suddenly had cash and time to fulfil a long-held ambition to be a marine surveyor. I have been pretty much always safe on boats and this is in no way small thanks to the hard work and integrity of surveyors. I felt it was pay back time I wanted to do my bit to make the crews, vessels and the environment safer. A year of hard work with IIMS gained me my diploma, one of the first awarded to a woman, which was a good basis for learning the skills to be a surveyor.



Q2. You are known as being something of a specialist in the increasingly important sector of dynamic positioning. What key skills have you had to develop to help you in this area?

Dynamic Positioning, like safety, is a culture and if this isn't present on a DP vessel the standard will not be high. Part of my job is to foster this culture, to encourage the crew to take ownership of the DP system, understand how it all, both man and machine, inter-relates and to take pride in being part of an efficient and safely operated DP vessel.

Q3. Why is dynamic positioning such an important topic and how is it likely to grow in the future would you say?

We have all heard about the slump in the offshore market, the fall of oil prices and the surplus of DP vessels. Many boats are laid up and a significant number, mainly older ones, may never work again in the offshore oil industry. The new market is leaner and meaner and many feel it will never regain the Halcyon Days. I am not an economist, I merely work at the coal face of the industry. Vessels (and crews) need to work to stay in top condition and I think it's the companies who have kept their vessels working, even accepting punishingly low day rates in order to do so, who will have fit and ready crews and vessels when the upturn comes.

Q4. Which of the many surveys you have carried out over the years has given you most satisfaction and why?

I don't really have a favourite. I am just thrilled when I find a problem, particularly a safety related one. Because of me doing my job the crew, vessel and environment are a little safer. This is true for DP surveys and eCMID inspections too.

Q5. Which aspect of surveying or inspecting vessels do you find the most challenging?

Offshore vessels are complex and unique. There is no such thing as a sister vessel, merely distant cousins. Probably the most valuable skill I have is to attend a vessel and very quickly assimilate the information of how the various components of the DP system - the engines, thrusters cooling, power management, gyro, control computers and much more are interconnected. I need to understand how the failure of one component affects the rest of the system and the position keeping ability of the vessel. Trials are then devised, conducted safely and the results understood. When things are not quite right the severity of the problem has to be categorised and a finding recorded in the report. Its keeping the overall picture, birds eye view, that is the real trick to getting it right.

A question I have often been asked is "how do you cope with

conflict of interest?" The person commissioning the survey may have a different agenda depending on where they are in the food chain - ship builder, owner or charterer. I always reply I am on the side of the vessel. My job is to make the vessel as safe as it can be - which, if you think about it - should be what all the stakeholders want.

Q6. What funny incidents can you recall whilst out on survey?

When a vessel loses position, either through a drift off or a drive off, this is a serious finding, but I am always quite pleased because it is better to have happened in a controlled environment and not next to a platform. This can then be investigated and its cause cured. It is normally quite dramatic when this happens but can often be quite amusing.

I recall on one vessel we broke the command signal to the main propeller and instead of failing to no thrust the propeller went full astern. We immediately hit the main engine emergency stop but the vessel had already picked up speed. I expected an irate Chief Engineer's call, but nothing. A while later he appeared on the bridge dripping hydraulic oil and holding up two pieces of broken pipe. In heart rending tones he wailed "Ursula, you broke my thruster!". The retractable bow thruster had been lowered at the time and they don't like speed.

Often when these big failures occur we end up with no propulsion. I love to claim to have drifted on the finest vessel in all the planet's oceans. When the propulsion fails the vessel becomes very quiet. On one such occasion we were drifting in eerie silence when we heard footsteps, a door slammed, more footsteps, another door and yet more footsteps until the Chief Engineer appeared on the bridge and breathlessly informed us. "Engines have stopped". Apparently in his horror he had totally forgotten about the telephone system not to mention that we might have noticed anyway.

Q7. You were an early adopter of the IMCA eCMID accreditation programme and one of just a handful of women from the 400 plus who have achieved the standard so far. In your opinion, how has objectively matching an inspector's skills against set criteria helped to improve the offshore inspection sector?

I think it's a good idea to have the inspector's skills audited before they are accredited as it has improved the reputation of the inspection.

Q8. What are the key differences between conducting a traditional survey versus being an eCMID inspector performing a vessel audit?

Control and flexibility – In a traditional survey you are much more in control of the document and can easily adapt it to suit the different parts of recording the survey. For instance, it may make the document more user friendly if you can use a table to present your data – this is not an option in the e-CMID. Every time you leave something out to fit the prescribed matrix you are compromising the value of the survey and the quality of the final document.

Q 9. How easy is it for a woman to make her mark in the world of marine surveying these days compared with yesteryear would you say?

When I am on a vessel I am a surveyor and the fact I am a woman is not relevant. I have always been treated with utmost respect and have never encountered any problems. Strangely when I first go on a vessel where they do not know me I invariably get a technical interview – to see if I know what I am doing. I am not sure if this relates to being a woman or just because I am someone they do not know, but my male colleagues do not seem to experience this.

Before starting Dynamic Surveys with Captain Hugh Raynor, I worked with another survey company and was based in Singapore. Quite suddenly they relocated me to their Europe office. I complained about the short notice and not getting a chance to ship my stuff back. They instructed me to take it as excess baggage. Eleven cases, a 32 inch TV and myself prepared to go home to my beloved Malta. As it happened my young daughter had joined me for the last week in Singapore and we left on the same night, she returning to UK. At her departure gate British Airways would not let her take two pieces of hand luggage a laptop and her teddy bear so I took the bear. At my departure gate I received a call informing I had to break my journey home and do a survey on a cable ship in Abu Dhabi. I have to tell you its hard enough establishing credibility as a female surveyor on an Arabic ship and bringing eleven pieces of luggage, a 32 inch TV and a teddy bear does not help!

Q 10. What advice would you give to young, upcoming surveyors of either sex as they learn their craft in a rapidly evolving technologically driven world?

Don't do it unless you really want to. It's a very hard way to earn a living and is definitely more of a vocation than a job.

Q 11. When your work is done for the day, how do you like to spend your leisure time?

I am very involved with my local church. I have served as church warden for some years now and find it very rewarding. I see a lot of the Christian standards in my church reflected in the crew of the vessels I work on. Whilst many of the crew members are not Christians they care for one another, look after each other and work together for a common good. On vessels you never seem to see the interracial or cross religion strife you so often see on land.

Q 12. What are the key attractions on living on the island of Malta that you would recommend to other people?

Malta is beautiful, warm, safe and you only have to scratch the surface to find layers of history, but its real hidden treasure is the people. They have an interdependent culture, which means they look after each other. Extended families are in constant contact, neighbours there for each other. In fact, not unlike being on a ship but a little bigger. I bless every day I spend in Malta.



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