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EPS and Techstars accelerate MaritimeTech development in start-up initiative

A new initiative formed by Singapore shipping company Eastern Pacific Shipping (EPS) and technology accelerator Techstars aims to address some of the largest challenges the maritime industry faces today by investing in start-ups. *Digital Ship* asked Eastern Pacific Shipping's (EPS') head of open innovation, Gil Ofer, and Dhritiman Hui, managing director of Techstars to explain more.

Last year, Singapore-based ship manager Eastern Pacific Shipping (EPS) announced that it was teaming up with early stage investor and accelerator Techstars to form the Eastern Pacific Accelerator powered by Techstars. This MaritimeTech accelerator aims to cultivate and mentor the next generation of maritime technology entrepreneurs to accelerate technology development and find solutions to real problems that exist today.

Digital Ship spoke with Gil Ofer, Eastern Pacific Shipping's (EPS') head of open innovation, and Dhritiman Hui, managing director of Techstars about the Eastern Pacific Accelerator powered by Techstars programme, and why investing in start-ups is so important for the maritime industry.

Eastern Pacific Shipping's (EPS') head of open innovation, Gil Ofer.

Initial achievements

In November 2019, the Eastern Pacific Accelerator powered by Techstars began a three-month intensive mentorship, research, development and collaboration programme with nine start-ups selected from hundreds of applications. Over the past few months, the start-ups have benefitted from mentorship from industry experts, access to EPS' operational data, and the opportunity to deploy their technology on EPS' fleet of over 150 vessels. In February 2020, a Demo Day was held where the start-ups pitched to an audience of investors, multinationals, government partners and other ecosystem players.

Eastern Pacific Shipping's (EPS') head of open innovation, Gil Ofer, explained some of the achievements and lessons learned from year 1.

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"Our most important learning from year 1 was that even an exceptionally traditional industry like shipping can embrace new technology with the right ideas and approach. The approach of the past within maritime was to develop new technology either internally (e.g. legacy software systems) or due to regulation changes (e.g. the double hull for tankers) and to fund these initiatives from investors within shipping. We found that an open innovation strategy whereby we invited both the venture capital and maritime communities to take part in our goal of driving the industry forward by collectively shaping ground-breaking technology was truly effective as we witnessed over 160 external mentors coming through are doors to meet the start-ups and engage with them via critical feedback and commercial discussions.

"What we find most striking is the collaboration between the start-ups and EPS. You always hear about how stuck in the past the shipping industry is. But we discovered that with the right ideas and approach, this industry too will successfully embrace technology.

"The other thing that really pleased us was how deeply involved the broader maritime community became. Large swathes of the industry - shipping companies, cargo owners, port operators, classification societies - all came by to meet with the companies we had invested in. Contracts and deals naturally followed."

To replicate the success of year 1 as the programme heads into year 2, Ofer said they will build on the momentum of year 1 both at the company level and at the industry level. "In other words, I want to have more mentors from within EPS and more mentors from the wider maritime community that share our desire to bring shipping to technological modernity."

Collaboration

At the beginning of the journey, EPS wanted to ensure a collaborative route was taken. Ofer said that he liked Techstars' mentor driven approach and saw Techstars as a good partner to help achieve its goals.

"When I went to visit the Rakuten Accelerator powered by Techstars in 2018, what struck me instantly, through observation and my conversations with a few of the founders, was the energy in the room and the collaborative culture of the program. I knew then and there that I wanted to replicate that sensation at EPS. While I admit that I wasn't fully aware of the value of the mentor-driven approach before kicking off our accelerator, I became so as I witnessed over 160 people from different sides of the shipping industry come through our doors and feel the same feeling that I felt at Rakuten – instantly sucked into the energy and ready to help out these fledgling companies by applying the Techstars mantra of "give first" without expecting something in return. To see people from possibly the most traditional industry in existence behaving this way was awe-inspiring and I'm excited to gather even more companies, suppliers, class societies, port authorities, and other shipping industry actors in the accelerator programs to come."

Ofer said that when looking for a start-up during the selection process, EPS wanted someone that fitted into their goals and aims. "Beyond fitting into our general investment scope (maritime technology or technology companies with compelling applications for maritime), what we've learned from Techstars, who have been investing in early-stage companies since 2006, is that the most crucial factor in selection process is the TEAM. Recognising that ideas almost always change over time and companies "pivot" (Facebook started off as a way to rate how attractive your peers in college were), the trait that we are most concerned with is how the entrepreneur/s react/s in the face of adversity. Looking at their past accomplishments and the interview process helps us understand whether the founder and start-up is a good fit."

Long term goals

According to Ofer, for EPS, there are three long-term goals. "First, we are interested in seeing a return on our investment both in terms of increased operational efficiency as a result of partnering with our portfolio companies, and also in their increasing valuations prior to their (hopeful) acquisitions or IPOs. Second, EPS would like to continue to develop the collaborative nature of the program by inviting as many players as possible in the maritime sector to participate as mentors to inject the start-up culture in an otherwise traditional industry, Lastly, and perhaps most importantly, is to focus on two P's: People and Planet. Both the Seafarer and Mother Earth have been neglected by the industry to this day, and EPS is optimistic that investing in technology together can positively impact both."

Why invest in start-ups?

When it comes to maritime start-ups, there are both challenges and opportunities for them to influence shipping business. One of these challenges is visibility. We asked Dhritiman Hui, managing director Techstars how they ensure that start-ups that join the programme get the visibility they need.

"Yes, there are challenges. But we prefer to focus on the opportunity. The maritime industry has plenty of equipment and service providers with hundreds of millions, and even billions, dollars in revenues. So clearly, this industry offers a lot of scale. This means there is plenty of opportunities for maritime start-ups to build big companies.

"In a decade or two from now, will we see a number of new names being added to the list of big equipment and service providers in the maritime space? Of course, we will. Will a number of them be technology companies that started life as a start-up? That's the case in every industry globally so of course that will happen here, too. Will some of them come from the EPS – Techstars partnership? We are striving to make sure that's the case.

According to Hui, "with a little bit of luck, maritime start-ups will raise the profile of the entire industry globally. And that raising of profile will unlock a lot of new opportunities for this industry.

"We think the opportunity exists. The maritime industry carries trillions of dollars' worth of goods and touches almost every life on the planet. Its reach is almost unparalleled. We want to exploit that and build new opportunities for this industry."

Dhritiman Hui, managing director of Techstars.

In the shorter to medium-term, Hui expects to see start-ups making the biggest dents in, "bringing about more more efficiency and making operations more environmentally friendly." In the longer-term, he expects to see start-ups creating new sources of income for the industry. "The reach, connections and data the industry is sitting on are significant. Truly visionary start-up entrepreneurs will help unlock all of that and create new pools of revenue."

Last year, a report published by Inmarsat and PUBLIC stated that they thought the supply of digital products and services to the maritime sector will be worth $278bn worldwide by 2030, with start-ups taking a significant share. While there has been some argument that there has been a lack of innovation in maritime, many believe that start-ups might be the ones to help address this.

"There have undoubtedly been fewer start-ups addressing the maritime industry than other industries," said Hui. "But our thinking is that that will inevitably change. Why is that? The maritime industry is fundamental to a lot of countries globally. Let's take Norway, Germany and Singapore as three examples. Maritime is core to these countries. And they also have a lot of engineering talent. Also, governments and local eco-systems in these countries is making 'starting-up' easier and easier for engineers and entrepreneurs from these countries. These trends will create more and more start-ups that will address the maritime industry."

There has also been some thought that there might be cynicism towards start-ups from large maritime companies. Hui said that maybe it's not cynicism but more a lack of a familiarity. "The maritime industry is a little less used to start-ups turning up with new ideas that other industries are. That lack of familiarity causes some friction. But again, we feel that will inevitably change."

DS

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Northern Sea Route gets connectivity boost

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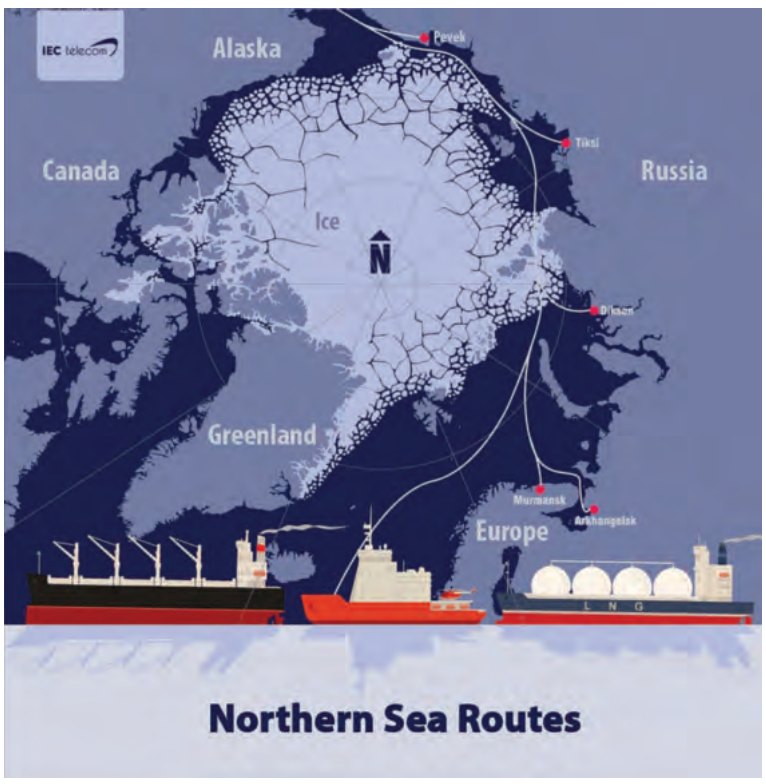
Passage through Northern shipping routes and Arctic waters has received a boost following the doubling of the connectivity speed of the Iridium CertusTM network, says maritime communications specialist IEC Telecom.



Northern sea routes could benefit from faster connectivity, says IEC Telecom.

As the shortest sea route between Europe and the Asia-Pacific region, the Northern Sea Route holds immense potential to compete with conventional trade lines. There has been a significant increase in maritime traffic across the main transport corridors in the Arctic, Northern Sea Route in the Russian Federation, the Northwest Passage in Canada as well as the Arctic Bridge from Canada to Europe. In the Canadian Arctic, traffic has tripled between 1990 and 2015. Moreover, cargo volume in the Northern Sea Route has increased by 40 per cent between 2016 and 2017.

Iridium CertusTM 700 service is commercially available at speeds of 700 kbps – the fastest L-band speed in the industry. This network with pole-to-pole coverage serves to further unlock new opportunities for the fleets operating in the North. Fishing fleets, commercial ships, and other vessels transiting Arctic waters can benefit from enhanced connectivity in these remote and potentially hazardous waters.

IEC Telecom reports that many of its clients operating in the Northern Sea region have recently switched to the Iridium Certus service. "Vessels operating in this region require robust solutions that can be relied upon under harsh weather conditions. Iridium Certus is the only global network able to meet these requirements," said Alf Stian Mauritz, managing director, IEC Telecom Norway. "With this new speed, Northern operators can share greater levels of data with their shore offices, avail VOIP calls, and access faster email exchange."

Upgrading to Iridium CertusTM 700 requires no new hardware for existing users. "As an Iridium master distributor, not only does IEC Telecom offer its customers the expertise required to transition to this service, we also provide a completely compatible network management solution, OneGate. With our technical support services, customers get better visibility over their remote satellite assets. Such solutions can help operators in the Northern region enhance their crew welfare options, access reliable cybersecurity and filtration, and even customise cloud-based features."

OneWeb files for bankruptcy

www.oneweb.world

Satellite communications start-up OneWeb has filed for bankruptcy after failing to secure funding it had been negotiating since the beginning of the year.

According to OneWeb, this investment would have fully funded the company through its deployment and commercial launch, however, as a result of market turbulence due to COVID-19, the firm has not been able to secure this investment.

One of OneWeb's largest shareholders, SoftBank, had already contributed US $2 billion and was reportedly considering further investment but made the decision not to.

The news comes less than a week after OneWeb launched 34 more satellites into space, bringing the total number of satellites in the OneWeb constellation to 74.

OneWeb filed for bankruptcy less than a week after it announced the successful launch of 34 more satellites into space. The total number of OneWeb satellites in space is now at 74. Image courtesy of OneWeb.

OneWeb states that it has filed for a number of customary motions with the U.S. Bankruptcy Court seeking authorisation to support its ongoing operations during the Chapter 11 process, including approval for the consensual use of its existing cash collateral to continue to fund the business. In addition, OneWeb is actively negotiating debtor-in-possession financing, which, if acquired and approved by the Bankruptcy Court, will ensure OneWeb is able to fund additional financial commitments as it conducts a sale process under Section 363 of the U.S. Bankruptcy Code. Together, these actions will allow OneWeb to meet post-petition obligations to its remaining employees and certain vendors in the ordinary course.

Adrian Steckel, chief executive officer of OneWeb stated: "OneWeb has been building a truly global communications network to provide high-speed low latency broadband everywhere. Our current situation is a consequence of the economic impact of the COVID-19 crisis. We remain convinced of the social and economic value of our mission to connect everyone everywhere. Today is a difficult day for us at OneWeb. So many people have dedicated so much energy, effort, and passion to this company and our mission.

"Our hope is that this process will allow us to carve a path forward that leads to the completion of our mission, building on the years of effort and the billions of invested capital. It is with a very heavy heart that we have been forced to reduce our workforce and enter the Chapter 11 process while the company's remaining employees are focused on responsibly managing our nascent constellation and working with the Court and investors."

Van Oord selects Marlink for licensed VSAT connectivity in Indian waters

marlink.com
www.vanoord.com

Van Oord has selected Marlink's high throughput VSAT for connectivity in Indian territorial waters, through an agreement with India's licensed Inflight Maritime Connectivity (IFMC) service partner, Nelco.

Van Oord has signed a fixed term contract for Marlink's SeaLink VSAT service after the successful conclusion of a trial in October 2019 onboard the trailing suction hopper dredger, Volvox Asia.

The capacity agreement ensures that Van Oord vessels can stay connected to flexible, resilient and high-speed broadband even in areas where previously, regional regulations could prohibit or restrict their ability to stay connected via satellite. It also means that customer vessels can remain in compliance with reporting requirements of national and international regulations.

Satellite communications are subject to license restrictions when operating in Indian waters, meaning that VSAT must be turned off, unless using a licenced service provider.

The result is either increased complexity for customer ICT departments or loss of access to bandwidth used for mission critical operations, crew connectivity and compliance. Working with Nelco, Marlink can now remove these challenges, ensuring that customers do not experience any service interruptions. Van Oord is the first Marlink customer to take advantage of seamless connectivity within Indian territorial waters.

"Van Oord has been a Marlink customer for more than 15 years and this new agreement extends our ability to stay connected and in compliance within Indian waters. Marlink's VSAT connectivity enables us to work smarter and safely while in a highly regulated area, so we can continue to monitor asset health and performance, comply with regulatory reporting and keep crew connected," said a Van Oord spokesperson.

Marlink's high throughput VSAT services will provide Van Oord with connectivity in Indian territorial waters. Image Courtesy of Marlink.

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Connecting crew during COVID-19

Inmarsat Maritime president Ronald Spithout says providing crews with enhanced levels of connectivity and support is critical at this unprecedented time and offers an insight into the work already underway with welfare organisations to assist seafarers in need.

Given Inmarsat's position as a leading provider of maritime VSAT and L-Band services at sea, it is hardly surprising that we have been alert to the direct connection between coronavirus and surging demand for crew voice call and data services. As elsewhere, anxiety levels at sea have been on the rise with the spread of COVID-19.

Since the virus first became widespread in Asia we have been working across the company and with our partners to take proactive steps to keep seafarers connected and in touch with loved ones during this difficult time.

In February, Inmarsat enabled free of charge additional call time for users of our ChatCard voice services for crew. All ship managers offering the service have been made aware of the offer, while we also sought help from groups such as the Singapore Shipowners Association to spread the word.

Inmarsat also provides medical advice and assistance free of charge to seafarers over Fleet One, FleetBroadband and F77 services - anywhere, anytime and for anybody in need. We have also prioritised telemedicine as an area for service development with our application partners, at no cost to owners or the crew.

However, with anxiety over coronavirus at a high pitch worldwide, those at sea are as entitled as any to the medical and policy updates disseminated by authorities and news media, whether aimed at seafarers themselves or their loved ones at home. In recent weeks, Inmarsat has also been working with a number of shipowners to find other ways of subsidising increasing bandwidth demands from vessels. Soon we will announce further incentives that our wholesale partners can choose to use to provide additional support for crew using our services.

During the current pandemic, it is worth noting that people working ashore can sometimes focus on secondary issues when they talk about crew welfare and well-being in today's connected world. The Royal Holloway, University of London 'Navigating Everyday Connectivities at Sea' report, commissioned by Inmarsat in collaboration with the Sailors' Society, illuminated patterns in behaviour that directly linked connectivity and welfare.

This report found that, as soon as a ship comes within range of a terrestrial network, seafarers use their mobile phone regardless of time of day and whether they are or are not working. Where seafarers had to ration their allowance, the researchers found it could mean that domestic issues were not resolved, adding to personal anxiety. One went so far as to say that 'the only thing more important than connectivity is food'. A seafarer working on the high seas worrying about those at home is unlikely to be focused.

The research also found that, when denied connectivity, crew members can be ingenious in finding work arounds: respect for crew welfare is all the more imperative in difficult times to avoid risks to a ship's cyber security.

President of Inmarsat Maritime, Ronald Spithout.

Inmarsat has sought to improve crew connectivity using the 'Fleet Hotspot' Wi-Fi solution for the Crew Xpress service launched for Fleet Xpress customers in 2019. Crew Xpress offers a managed 'channel' for crew login, with time/data exchanged for vouchers/online payment.

As COVID-19 unfolds, much more will certainly need to be done to work more closely with shipowners, managers and even the Master on board to ensure crews get access to the packages available. In addition, earlier this week, I hosted a conversation with the International Seafarers' Welfare and Assistance Network (ISWAN) and the main maritime charities to discuss development of a crew portal and further data and voice incentives for crew quarantined onboard.

We will continue to discuss and act on what more can be done on crew connectivity by all parties in the days and weeks ahead and we already have a working group with ISWAN and a number of charities to support seafarers as much as we can during this time.

We need everyone to embrace the challenges and work together on these initiatives: the responsibility doesn't fall solely on the satellite operator or welfare association at this time: we're all in this together. DS

Station Satcom and FrontM announce connectivity partnership

www.stationsatcom.com
frontm.com

FrontM and global satellite communications provider Station Satcom headquartered in India have signed an agreement to help maritime businesses bring their ship to shore teams closer together in real time.

The agreement will see the companies connect their global people and teams via the FrontM Collaboration and AI software platform, which is a scalable and secure communication hub that connects people and tools to facilitate work in remote and isolated environments.

"Our connectivity partnership with Station Satcom marks a real expansion in our collaboration offering. Now a host of maritime companies will be able to deploy FrontM's collaboration tools, offline applications and automation tools too quickly, securely and seamlessly operate and complete everyday tasks, which is great for maritime productivity, whilst breaking down ship to shore workplace silos," said Lisa Moore, FrontM's VP commercial product management.

Satcom Global upgrades Aura VSAT with Intellian NX Series

www.satcomglobal.com
www.intelliantech.com

Satcom Global has announced that its flagship high-speed Aura VSAT solution now includes the latest Ku-band hardware from Intellian's NX series of maritime VSAT antennas, including the v85NX, v100NX and v130NX models.

Satcom Global made the decision to introduce the new and improved Intellian NX series to the Aura solution due to the industry leading RF design and 'best in class' performance for 85cm, 1m and 1.25m antennas. As data demands continue to grow, the high performing systems will reliably deliver Satcom Global Aura VSAT connectivity to the maritime market enabling access to the high-speed connections, quality of service and global coverage widely associated with the Aura network.

The Intellian NX series delivers additional benefits to Satcom Global including simplified 'dome-on' installation with single coaxial cable, supported by the new Intellian AptusNX platform, leading to a quicker and more efficient install experience. The NX series also boasts increased reliability with a reduction in components and necessary spares; up to 40 per cent through common spare parts.

"Satcom Global continues to grow its business with Intellian through close collaboration and their commitment to providing market leading technology," said Eric Sung, CEO of Intellian. "The NX Series is the perfect product range for customers wanting to access the highest performance, whilst getting great value. Our global presence and speed of delivery have helped enable the rapid deployment of their VSAT services to customers across all regions and are critical in meeting the maritime end-customers' business needs of today. We are confident our partnership will continue to grow, with the new NX series products providing their customers with a future-proof and feature rich solution."

Ian Robinson, CEO of Satcom Global, commented: "Our strategic partnership with Intellian has been integral to the development and growth of Aura VSAT, and we look forward to our continuing success as we move forward with the NX series. We were thrilled to receive the 'Fastest Growing Partner' award from Intellian last year, which is testament to the significant advancements we are making in the maritime VSAT market."

Satcom Global's Aura VSAT solution now includes the latest Ku-band hardware from Intellian's NX series of maritime VSAT antennas.

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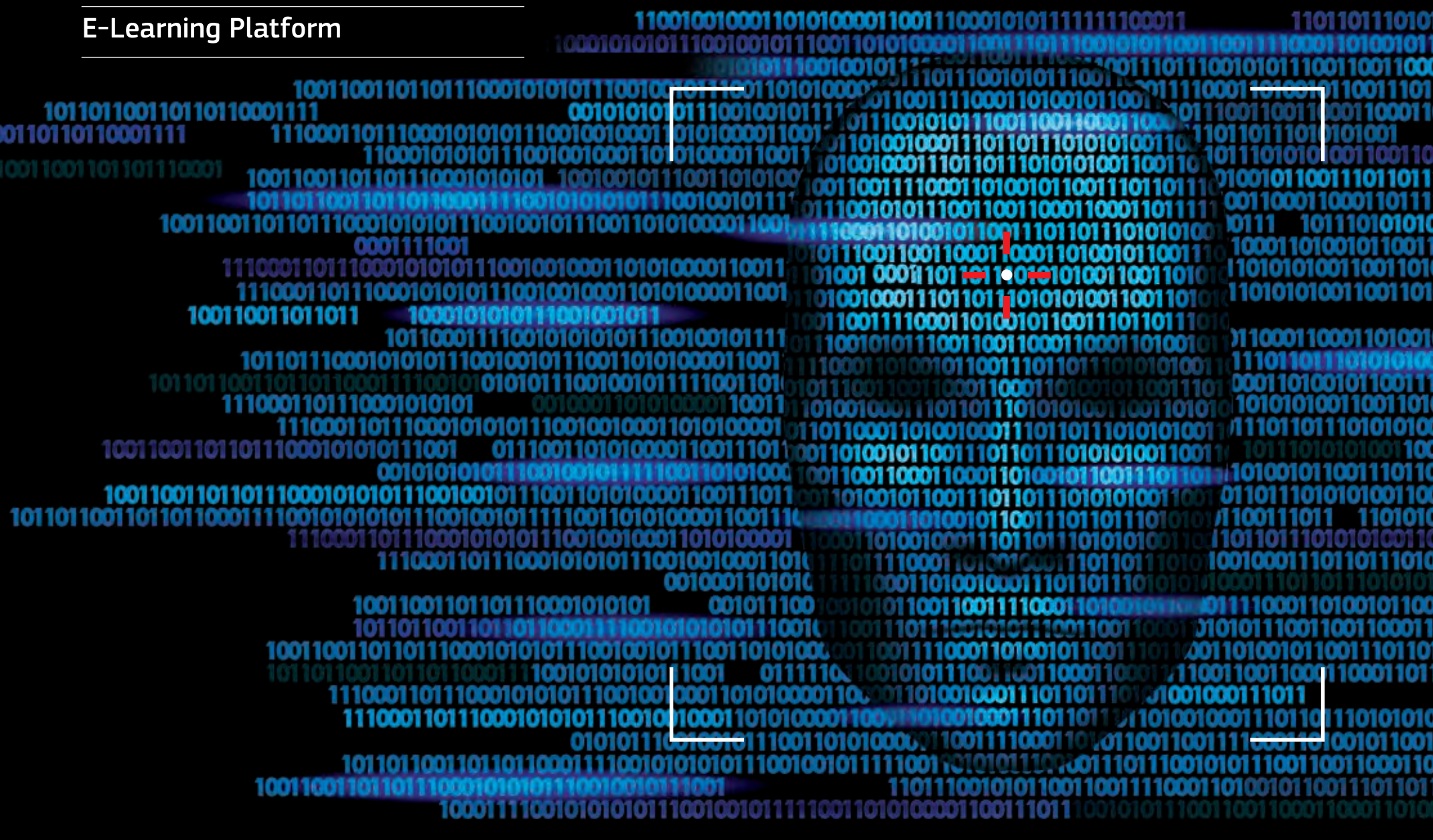

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Maritime telehealth for crew wellbeing

As the global pandemic continues, ships are still moving and ports are battling to stay open, but the wellbeing and health of crew must remain priority. Dr. Chris Henny from Evitalz explains how telehealth, which involves creating a 'digital passport' of crew health, can help companies better understand seafarer wellbeing.

Now that the World Health Organisation (WHO) has declared a pandemic for COVID-19, we will surely see some impact on seafarers. Particularly cruise ships, but also cargo ships will be quarantined on entry into ports. Crew will be held on ships and may not be able to access medical services on shore.

Nevertheless, in this time of heightened awareness around infectious disease, let us be clear that 80 per cent of seafarers that get sick, and might need evacuation, are the result of Non Communicable Diseases (NCDs) such as diabetes, and heart disease and stroke, obesity, in addition to accidents, malaria, dengue. So, a lack of early detection, so that preventive measures can be taken is important.

In this age and technology and increased digitalisation, ships should have evidence-based hospital like diagnostics capabilities but until now these have recently been extremely expensive and usually only found on large crew ships with a doctor onboard.

Seafarers face numerous problems at sea with impact on their health, including:

- Longer voyages and short port stays;
- Lost time due to speeding up, slow down and extended anchorage due to illness are expensive;
- Lack of telehealth facility;
- Close proximity in confined spaces,
- Diets are not always varied enough
- Exercise opportunities onboard are limited
- Some nationalities have a higher incidence of things like obesity or diabetes.
- Ability to visit a medical facility on shore or not knowing the quality of the doctor in an unknown land who does not necessarily speak your language.

Today we have 1.5 million seafarers, 60,000 vessels, and around 15 TMAS public /private.

Last year, 20,000 seafarers were assisted, of which 2,000 medevac'd. Most ships have only a basic first aid kit, hardly any ship have approved vital signs monitors, there are no crew wellness programs, while most crew report verbally to their TMAS agencies.

And sometimes mixed crews even have to report to different Telemedical Assistance services depending on their nationality.

Vital signs and health monitoring using a Telemedicine system on a regular basis can help alleviate these problems, and be a huge benefit both to crew themselves and their companies thus allowing for the provision of private, confidential sensible individualised advice to crew members.

By monitoring the five main life signs, early detection of problems can mean less expense and downtime, and fewer unnecessary vessel rerouting deviations or helicopter evacuations, which are expensive and dangerous.

Why are vital signs important? They generally tell you how well the crew is, they also determine the treatment and protocol that has to be followed. They very accurately determine the physical condition of the body and how it is reacting to various other parameters. The five vital signs are:

1. Temperature
2. Blood pressure
3. Blood sugar
4. SpO2
5. ECG

It is now time to create a crew health digital passport so doctors anywhere can have access to patient history and any allergies, preconditions etc., before advising treatment and thus enable the company health officer to look at a seafarer's continuous wellness record.

Life at sea is not easy and increasingly short port stays and long absences from home can take its toll on crew.

This is telehealth, which goes beyond telemedicine in the sense that it takes care of education, advisories, monitoring and a lot of other things.

For all you shipowners concerned about the safety, comfort and wellbeing of your crew, I should like to share some information.

As you know the Maritime Labour Convention is now fully in effect and this in principle requires that Crew should have equivalent access to medical assistance and services as they might expect on shore.

The problem is of course if you have a multi-national crew what level of service do you provide. Also, with some vessels being chartered and flying different flags, whose legislation do you follow?

Therefore, it simply makes sense to implement a common plan across all a company's vessels as you cannot provide different levels for different vessels or different nationalities, or for that matter different levels between officers and ratings. This is a real dilemma even for those with the best intentions.

In addition, even besides the fact that it is mandatory, it also makes good sound economic sense to medically look after the crew:

1) A healthy crew is more productive. A sick one expensive.
2) Good reliable experienced crew are expensive to train, keep fit and increasingly hard to find.
3) As vessels spend less and less time in port out of cost and efficiency concerns – shipowners only make money when the ship is moving goods – the crew often do not have time for regular medical check-ups. Thus, over time their health deteriorates – especially from countries with a high incidence of diabetes or heart problems from being overweight.
4) A crewmember who gets injured or sick while at sea may require expensive and sometimes unnecessary diversion of the ship and/or hospitalisation, repatriation, and compensation of the crew member in addition to the cost of getting a replacement onboard.
5) Life at sea is not easy. Due to the increasingly short stays in ports, and the long absences from home and loved ones, providing someone they can communicate with, on problems they may be facing, will reduce the risk of crew suicides which unfortunately are not so uncommon.
6) Crew feel better looked after & cared if they can have access to a Telemedical service.
7) Reducing any of the above costs to the insurers also has a value.

And the company gets early information about the possibility of communicable diseases being spread so steps can immediately be taken to limit the effects.

The excuse for not implementing a proper medical service and follow up has until recently been that shipowners were reluctant to do this because of the very significant cost of providing onboard medical follow up, easy to use diagnostics kits, and access to a reasonably priced regular medical service; other than that offered by the TMAS (Tele-Medical Assistance Service.) in emergency.

This last problem has now disappeared. A start-up in India called E-Vitalz has now brought a 3000 Euro diagnostics solution associated with a paid service per vessel of 20 crew, at 50 -100 Euro a month on the market. The kit is designed to serve a small community of 20-30 people on a cargo vessel who are often too far away from medical assistance and yet who require regular medical check-ups, or may have a need for access to emergency medical assistance. It is in short, a diagnostics "clinic in a box".

It covers the five principle life signs (SpO2, Temperature, ECG, Blood pressure, blood glucose, as well providing quick tests for malaria and dengue and troponin I). The easy to use single button sensors connected to a tablet that can connect to any satellite communications device or cellular phone with even slow speed data.

It offers multiparty video consultation to a specialist or the company doctor who can both be on a call with the captain. All calls are full encrypted (256K AES). Still pictures can be taken of things like rashes and injuries and can be sent to a secure medical record repository web service as an electronic patient record, which can be accessed worldwide. The connected doctor or hospital can receive the life-sign data and test results in real time from the device onboard while talking over video conference or text chat. The kit is very small and stores easily and weighs only around 2.5Kgs. So is highly portable and comes in a rugged pelican case or a soft carry bag.

The company takes security and data privacy seriously and has been certified ISO 27001, HIPAA & GDPR compliant. Medical diagnostic devices used are FDA / CE approved.

Other required sensors can be added at additional cost such as 8 or 12 lead ECG, ultrasounds, Spirometer, digital stethoscope, Otoscopes etc.

In short, for medical diagnostics or even regular medical follow up it ensures a much higher quality of care and enables a remote doctor to make a much better diagnostic and treatment recommendations.

A shipowner can connect the kit to any telemedical assistance services or even their own company doctors if desired. The doctors can view the tablet and electronic patient records in any desired language, with new languages implementable in a few days. DS

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Solid-State X-Band IMO Chart Radar
Model: **FAR-3x20-NXT**

Solid-State S-Band IMO Chart Radar
Model: **FAR-3x30S-SSD**

www.furuno.com

Connectivity and e-health at sea: Improved care for seafarers and offshore workers

Voyage diversions for medical reasons are costly for shipping companies, however, some of these diversions could be avoided with modern telemedicine, writes Morten Hagland Hansen, VP, commercial maritime & energy at SES Networks.

Recent research estimates that one in five ships sailing globally have to divert course for medical reasons on a yearly basis, with an average cost of $180,000 per ship diversion. There's no doubt that urgent treatment for unexpected medical emergencies can help save someone's life. However, some reports suggest that at least 20 per cent of the cases that trigger diversions aren't critical and could be avoided through the use of modern onboard telemedical assistance.

Fortunately, advancements in new e-health methods have allowed for remote consultations, diagnoses and - in a limited but growing number of cases - treatment too. These developments have advanced clinical outcomes for seafarers and made steady improvements to life at sea and vessel efficiency.

When offshore got onboard

The oil and gas industry was amongst the first sectors to leverage connectivity at sea to improve healthcare, which is no surprise since these crews spend long periods in remote locations. During the 1980s, the offshore industry pioneered telemedicine, using audio calls and fax connections to offer consultations. The technology was rudimentary by today's standards, but for an offshore worker who was not able to have a medical evacuation for days due to weather conditions, these consultations made a huge difference to their wellbeing.

The offshore industry saw a step change when fast and reliable satellite-enabled internet connectivity became commonplace, allowing it to quickly replace the old communications tools with novel and advanced applications. Onshore specialists are now able to use HD video for regular consultations, and connected devices allow doctors to monitor a patient's vital functions. This has improved access to healthcare for those at sea, as well as making diagnosing and treating medical conditions simpler and more accurate.

Advances in satellite technology today are facilitating another step change in onboard medical care. High speed, low latency connectivity – such as that provided by SES's O3b medium earth orbit (MEO) satellite constellation - is allowing healthcare specialists to access a far more comprehensive suite of tools today, such as remote viewing for compact digital scopes and CT scanners. Where this sounds technical, in practice it means that many – often complex – diagnoses can now be made remotely, and without the need for biopsy samples to be couriered to an onshore laboratory. This next generation of medical technology is currently used most frequently onboard military vessels and hospital ships. However, other ship operators may soon be able to implement similar technologies and reap comparable benefits for their crews.

Finding the cure

The development of call and fax-based telemedicine represented a step change in healthcare at sea, as did the development of video consultations and connected systems to monitor vital signs. The next step change comes with connectivity-led technology applications reliying on the high-throughput, low-latency capabilities of next-generation satellites systems to enable comprehensive diagnoses and treatment at sea. Satellite commuication systems, such as the next-gen O3b mPOWER, will enable better and faster medical care for seafarers and offshore workers, while bringing simplicity to all aspects of vessel operations. DS

Morten Hagland Hansen, VP, commercial maritime & energy at SES Networks.

Inmarsat takes founding role in Asian start-ups decarbonisation programme

www.inmarsat.com

Inmarsat has become a founding member of Asia's first 'Decarbonising Shipping' initiative to harness the power of start-ups to meet UN targets on greenhouse gas emissions, which launched earlier this month.

The regional initiative, based in Singapore, is part of the Trade & Transport Impact (TTI) programme from venture development firm Rainmaking to bring start-ups together with backers with maritime experience and expertise. Inmarsat joined the first two cycles of TTI, held in Europe in 2019, which scouted 1,200+ start-ups and led to 24 collaboration projects.

Backed by the Maritime & Port Authority of Singapore, the new initiative is expected to identify 1,000+ projects offering models to tackle decarbonisation, with selected start-ups to be matched with maritime industry leaders willing to build collaborative pilot projects. Alongside Inmarsat, other confirmed partners include Cargill, DNV GL, Hafnia, MC Shipping Inc., Vale and Wilhelmsen.

Inmarsat is among the founding members of the 'Decarbonising Shipping' programme.

"This is a list of organisations whose significance for the maritime industry speaks for itself," said Ronald Spithout, president, Inmarsat Maritime. "Shipping and its customers are demanding solutions and technology to address the decarbonisation targets set by regulators and this is where start-ups and market disruptors come in."

The International Maritime Organization is targeting a minimum 50 per cent cut of greenhouse gas (GHG) emissions from ships by 2050, and average carbon intensity (CO2 per tonne-mile) reductions of 40 per cent by 2030 and 70 per cent by 2050 compared to 2008 figures.

Inmarsat's recent research report 'Trade 2.0: How Start-ups are driving the next generation of maritime trade', predicted the value of Ship Technology (ShipTech) rising from $106bn to US$278bn by 2030 driven in part by innovators and disruptors providing solutions that will help monitor and cut emissions.

"Despite the hard targets and willingness to invest, nobody actually knows how to meet the challenges," added Spithout. "TTI in Europe in 2019 showed how effectively this programme identifies start-ups that can make a difference and joins them up with the maritime leaders that make things happen. This is an initiative focused on action, rather than words."

Michael Pomerleau, partner and investor at Rainmaking, commented: "In tackling the decarbonisation agenda, we will bring together disruptive start-ups and entrepreneurs with the scale, capability and reach of global industry giants, in order to create game-changing collaborations. Through these partnerships, we aim to test and validate thousands of solutions with exponential impact and scale them on within an extremely short horizon during the programme."

In the last year, Inmarsat has launched its own IoT platform – Fleet Data – and its own dedicated bandwidth service – Fleet Connect – and has continued to develop its Certified Application Provider (CAP) programme which now has over 20 certified providers including ABB, NAPA, Hyundai Global services and Nautilus Labs.

As part of the programme, Inmarsat will provide a unique and fast-tracked opportunity to selected companies to become a Certified Application Provider allowing the selected startup to accelerate the scale-up of their application through extended outreach and removing the need for their own solution-specific hardware.


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MAN PrimeServ adds cybersecurity initiative to retrofit portfolio

www.primeserv.man-es.com

MAN PrimeServ, MAN Energy Solutions' after-sales division, has announced a new digital addition to its retrofit portfolio. Called 'MAN EngineVault', the new initiative prepares shipowners for developments within the increasingly important area of marine cybersecurity. In connection with this, the IMO, SIRE and SOLAS are all set to introduce guidelines from January 1, 2021 that will require operators to address the issue.

Specifically, MAN EngineVault revitalises existing engines, machinery, auxiliary systems, instrumentation and control systems that have already operated in the field for multiple years, protecting main-engine networks from online and physical cyberattacks.

Unique in the marine industry, MAN EngineVault combines state-of-the-art software and hardware to provide firewall protection, comprehensive whitelisting and application-layer protection that seals engine networks off from virtually any known threat – including on-board attacks via compromised USB flash drives and similar, physical media.

Michael Petersen – vice president, head of PrimeServ Copenhagen – said: "Data is shaping the future of shipping. Engine data in particular is essential to help our customers make smarter decisions and better predictions. We realise that the increase in digitisation and network-based systems also increases vulnerability for cyberattacks that can potentially paralyse entire businesses. Therefore, implementing defensive barriers – also for your vessels' main engines – should be an essential element in proactive cybersecurity management."

As well as comprehensive, in-house testing, MAN PrimeServ has also successfully trialed MAN EngineVault in the field aboard the 'Adriatic Gas', a semi-refrigerated carrier owned by UltraShip, the international marine group.

Kaj Pilemand, chief technical officer at UltraShip, said: "Being a trusted partner to our customers is key to our operations. Consequently, cybersecurity is high on our agenda to ensure that staff, vessel and cargo are shielded against online and physical cyberattacks, so we can continue to fulfil the responsibilities towards our stakeholders."

Petersen added: "One of MAN PrimeServ's aims is to contribute to areas where we can provide unique benefits to our customers' business. Ultimately, MAN EngineVault optimises the availability and efficiency of ship installations. It is our firm belief that cross-industry cooperation is essential to the success of the digital transition that the industry is currently experiencing, and in this respect we thank UltraShip for their role in helping to bring MAN EngineVault to the market."

Even in the event of a successful attack, MAN EngineVault can immediately return engine networks to their last-known safe state. MAN EngineVault will come as standard in newbuilt ME-engines from May 2020.

MAN EngineVault prepares shipowners for developments within the increasingly important area of marine cybersecurity.

Industry collaboration key in Cyber-SHIP Lab progression

Experts in cybersecurity and maritime operations are forging ahead with the creation of a first-of-its-kind research facility at the University of Plymouth.

The Cyber-SHIP Lab was awarded funding by Research England (part of UK Research and Innovation) in November 2019 and will bring together a host of connected maritime systems currently found on an actual ship's bridge.

Once the build phase of the project is complete, it will complement the University's world-leading maritime facilities and enable researchers to improve global shipping security while providing training for those working in the sector.

A key element of the project is its extensive collaboration with industry. There are 18 commercial partners working alongside the University to bring it to fruition.

They include ship operators as well as companies involved in the supply of hardware and software, the construction of ship's bridges and the training and management of personnel who work in the commercial shipping industry all over the world.

Professor Kevin Jones, executive dean for science and engineering and principal investigator for the project, said: "This project has the potential to be a real game changer for the shipping industry. Cyber-attacks are a Tier1 National UK threat and the need to protect our maritime operations has never been more crucial, or more challenging.

"As such, the industry involvement in this project is vital, as it is only by working with those in the sector that we can develop the solutions that can be applied in the real world."

The Cyber-SHIP Lab has been funded for three years with a view to it becoming self-sustaining, and will address a number of complex and interlinked issues affecting the maritime industry.

It will take into account both technological and human behavioural aspects in order to effectively mitigate threats, especially considering the huge variation in vessel types, which can be subjected to cyber-attacks in differing ways for differing motivations.

The University signed a Memorandum of Understanding with Information Risk Management in late 2017, and that partnership will continue through the Cyber-SHIP Lab project. Charles White, CEO of Information Risk Management, said: "IRM's established research and innovation relationship with the University of Plymouth enabled us to offer a letter of support for the Cyber-SHIP Lab. As a global engineering R&D company, Altran recognises that cybersecurity is now at the core of safety criticality for maritime companies. We look forward to working further with the University of Plymouth to explore best how these fantastic facilities can be used to further advance the industry whilst protecting critical national infrastructure."

Professor Kevin Jones, said: "This project has the potential to be a real game changer for the shipping industry. Cyber-attacks are a Tier1 National UK threat and the need to protect our maritime operations has never been more crucial, or more challenging.

Wärtsilä Translink certified compliant with latest DNV GL cybersecurity rules

www.wartsila.com
www.dnvgl.com

Wärtsilä has been awarded a DNV GL type-approval certificate and cybersecurity certification by the International Electrotechnical Commission (IEC) for its Translink solution, part of the company's connected ECDIS concept.

The cybersecurity verification has been issued according to the updated DNV GL rules and the internationally recognised standard for cybersecurity for bridge and navigation systems, IEC61162-460.

Translink is a system that comprises the hardware, router, and software components. Together, they ensure that data can be encrypted as it is transmitted across the network using the latest protocols of cybersecurity. The certificates validate that the Translink Gateway has the key components in place to ensure secure operations.

Wärtsilä achieved the certification after in-depth analysis by DNV GL, verifying that the system follows best practices on cybersecurity.

"Digitalisation offers more efficient and better ways of operating and designing vessel equipment, such as integrated voyage planning including the remote update of ECDIS charts. With a 3rd party cyber verification, vessel owners can take advantage of such new technologies with assurance that it follows best practice cyber security design. Wärtsilä Voyage has achieved the first Cyber Secure Type Approval using the updated February 2020 Type approval programme," said Jarle Coll Blomhoff, group leader Cyber Safety & Security, DNV GL.

"Great work has been done to ensure that Wärtsilä Translink not only complies, but sets the standard for ship-to-shore data exchange through secure channels. The full compliancy with IEC61162-460 and DNV GL Cyber Secure rules takes Wärtsilä Translink to an unprecedented level of security, quality and trust," commented Anton Karelskiy, solution manager, Wärtsilä Voyage.

The Wärtsilä Translink provides a cyber secure gateway to connect Wärtsilä navigational systems. Image courtesy of Wärtsilä.

ClassNK Consulting launches cybersecurity e-learning

www.classnk.or.jp
www.kddi.com

ClassNK Consulting Service has announced the launch of a cybersecurity training service (e-learning), developed in cooperation with KDDI Corporation (KDDI) and KDDI Digital Security (KDS).

Main features include:

- The program is focusing on the maritime industries.
- The program supports Japanese and English and provides a certificate of completion after a comprehension test. This certificate can be used for an education record of Cybersecurity Management System.
- The program is available anywhere and anytime via smart device and PC.
- The program is certified by ClassNK in compliance with the Guidelines on Cybersecurity Onboard Ships Version 3, produced and supported by BIMCO (The Baltic and International Maritime Council).

In a statement released by ClassNK, the classification society says that the increasing use of many solutions utilising "Big Data" and IoT technologies has brought benefits to the industry but it has also introduced cyber risks among maritime industries. Under these circumstances, it's an important first step towards cyber safety for those who are engaged in ship operation and other related industries to gain proper knowledge. NKCS, KDDI and KDS offer a training program combining the companies' expertise in offshore and onshore.

ClassNK and KDDI have launched an e-learning cybersecurity service.

New GTMaritime solution protects shipboard systems from cyber-threats before they emerge

www.gtmaritime.com

A new solution from GTMaritime counters a major cybersecurity weakness of ships at sea today by deploying critical software and security patches to protect shipboard systems before threats emerge. GTDeploy provides a software deployment platform to deliver security updates to ships wherever they are in the world 'in the background' without requiring intervention by IT staff or distracting crew.

Hackers actively exploit the lack of urgency given by organisations to updating software, even though software patch management can be as vital to cyber-risk management as overtly defensive measures such as email filtering, network segregation and unified threat management. GTDeploy has been designed to make patch management integral to the maritime IT environment.

GTDeploy supports automatic updating – as seen on smartphones – for pushing out software fixes as soon as a newer version becomes available. It can add, refresh or uninstall security updates, patches or entire applications and gives fleet IT managers the flexibility to prioritise updates based on urgency and chose when and/or where they take place.

GTMaritime head of operations, Jamie Jones, said: "Software updates get pushed down the list of priorities for a variety of reasons. Sometimes there are simply more immediate problems that need dealing with but often this is to do with pressure on budgets: the cost of sending someone out to a vessel may be hard to justify. GTDeploy removes that pressure."

Whether updates are better performed when a vessel is under way or postponed until reaching port, GTDeploy allows applications to be managed through an intuitive drag-and-drop dashboard interface. Its use saves ship operators time and money by reducing the logistical burden of either manually updating every PC remotely or sending IT personnel or local agents to visit ships in person.

GTDeploy is airtime agnostic, which means it will function regardless of the type and capability of satellite communications set up on a ship. This is particularly relevant for mixed or managed fleets, where ships have different hardware and varying configurations. If an application needs additional library files, for example, these are fetched automatically and included in the transmission package.

GTDeploy helps vessel owners cope with the proliferation of software onboard as the industry embraces digitalisation and transitions to data-centric operating practices. "As the number of onboard systems multiply and complexity grows, so does the urgency and resources needed to maintain them," said Jones.

GTDeploy paves the way for a more pro-active approach to managing onboard software, he adds. With cybersecurity due to come under the scope of Safety Management System of the ISM Code from next January, vessel operators must demonstrate that robust and systematic processes are in place to address vulnerabilities and reduce exposure to malicious code.

GTDeploy is built on FastNet, a data connectivity platform developed by GTMaritime to manage ship/shore data flow intelligently as shipping companies embrace and transition to a more digital way of working. It comprises a package of services for encrypting, compressing and prioritising data communications to make best use of the satellite link and available bandwidth.

ABB and DNV GL make history with first vessel cybersecurity verification

www.dnvgl.com
new.abb.com

In a milestone for the marine industry, ABB's solutions onboard a large passenger ship have been awarded cybersecurity verification from classification society DNV GL.

As a result, this vessel became the industry's first to achieve system compliance under DNV GL's framework for integrated cybersecurity.

The state-of-the-art cybersecurity resilience for the vessel was enabled by close collaboration of ABB, the shipowner and DNV GL during the construction phase at a shipyard in Europe. Cybersecurity management processes will continue during the ship's operations, with the system's resilience maintained throughout the lifetime of the vessel.

"It is vital that the maritime industry focuses on cybersecurity as an essential part of both design and operation," said Johann Melsted, area manager Benelux & France for DNV GL. "Which is why we are so pleased to be working with forward looking partners, who are prepared to engage with this emerging risk and demonstrate their commitment to tackling cyber threats."

In order to achieve sustainable shipping, vessels are increasingly fitted with integrated automation systems and digital solutions. As part of the Fourth Industrial Revolution, the vessel's systems are more connected than ever before, presenting threat vectors previously unheard of in shipping. This is driving the need for closer and earlier collaboration on cybersecurity between all key stakeholders in the newbuilding process. DNV GL's Integrated Cyber Security Dependent Systems verification establishes a framework to address cybersecurity levels for the main functions of a vessel – both during construction and in operation.

While the framework is applicable to any vessel, greater sophistication and deeper integration of operational technology systems in complex vessels such as cruise ships mean that appropriate cybersecurity management is paramount. While digitalisation offers opportunities to measure and manage efficiencies across the entire fleet, securing these data streams is critical to the safety of the vessels' passengers and crew.

"ABB recognises the importance of cybersecurity in the marine industry and is working closely with shipowners, yards and classification societies to enhance cyber resilience of ships," said Juha Koskela, managing director, ABB Marine & Ports. "As vessels become more electric, digital and connected than ever before, it is of vital importance that we equip and empower seafarers with reliable solutions that are cyber secure."

The vessel is powered by ABB Azipod electric propulsion system.

ABB and DNV GL make history with first vessel cybersecurity verification.

DCSA publishes implementation guide for IMO cybersecurity mandate

dcsa.org

The Digital Container Shipping Association (DCSA), a neutral, non-profit group established to further digitalisation of container shipping through technology standards, in conjunction with its nine member carriers, has published the DCSA cybersecurity implementation guide. The guide aims to facilitate vessel readiness for the IMO Resolution MSC.428(98) on Maritime Cyber Risk Management in Safety Management Systems.

The best practices outlined by DCSA provide all shipping companies with a common language and a manageable, task-based approach for meeting the IMO's January 2021 implementation timeframe.

The DCSA cybersecurity guide, DCSA Implementation Guide for Cyber Security on Vessels, can be freely downloaded from the DCSA website. The guide aligns with existing BIMCO and NIST (US National Institute of Standards and Technology) cyber risk management frameworks, enabling shipowners to effectively incorporate cyber risk management into their existing Safety Management Systems (SMS). The DCSA guide gives shipowners the tools they need to help designated technical crew members mitigate the risk of cyber attack, or contain damage (fail safe) and recover in the event of an attack.

"As shipping catches up with other industries such as banking and telco in terms of digitisation, the need for cyber risk management becomes an imperative," said Thomas Bagge, CEO, DCSA. "Due to the global economic dependence on shipping and the complex interconnectedness of shipping logistics, cyber-attacks such as malware, denial of service, and system hacks can not only disrupt one carrier's revenue stream, they can have a significant impact on the global economy. As a neutral digital standards organisation, DCSA is uniquely positioned to help vessel owners mitigate the increasing risk of cyberattack on their ships, and in turn, on the industry at large."

The DCSA cybersecurity implementation guide breaks down the BIMCO framework into themes and maps these themes to the controls that underpin the NIST functional elements: Identify, Protect, Detect, Respond, Recover. DCSA provides non-technical explanations and specific actions to be taken to address each NIST element in accordance with a company's level of cyber maturity within each BIMCO theme. Following DCSA guidance will provide vessel owners with a catalogue of cybersecurity safeguards aligned with each vulnerability identified during risk assessment, together with notes explaining any residual risk.

Jakob Larsen, head of maritime safety & security for BIMCO said, "The DCSA implementation guidance provides a thorough and refreshing deep dive into the challenge of how to implement cyber risk management in a shipowner company. Initially thought of as a tool for container carriers, the guidance can also inspire the thinking in other shipping sectors as well as the ongoing update of the major shipping associations' benchmark document 'Guidelines on Cyber Risk Management Onboard Ships'."

A group photo of delegates at Digital Ship's vessel performance forum in Athens on February 11, 2020. We heard speakers from Pantheon Tankers / Alpha Bunkers, Bernhard Schulte, LATSCO Marine Management, METIS, Wartsila, Miros, Arista Shipping, Keystone Law, Tsakos Columbia and Iason Hellenic Shipping talk about methods they are using to improve vessel performance and how well they are working. You can download many of the presentations from the event at www.events.vpoglobal.com/vpo-athens-archive

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Shipparts.com partners Nanyang Polytechnic and ABS in 3D printing project

shipparts.com
www.nyp.edu.sg
ww2.eagle.org/

Online procurement company for marine equipment ShipParts.com has signed a research collaboration agreement with Singapore's Nanyang Polytechnic (NYP), and the American Bureau of Shipping (ABS).

The agreement aims to prove standards for the certification of metallic components produced by NYP's Additive Manufacturing Innovation Centre (AMIC) for maritime application.

The SGD$350,000 project, partly subsidised by the National Additive Manufacturing Innovation Cluster (NAMIC), will qualify the 3D printed metal part of an end-user component using a Selective Laser Melting 3D printing machine. The SLM technology can print complex parts in a variety of materials including stainless steel SS316L, which is widely applied across the industry owing to the corrosive nature of the maritime environment.

In the first phase of the ten-month project, beginning April 2020, the research teams will develop metal part printing procedures and carry out tensile, chemical and microstructure tests of the printing medium against ABS rules and standards governing weld and material strength.

Phase two will include the 3D printing of a pump impeller metal component and evaluate the performance of the part in standard equipment. The project is expected to complete in January next year.

"A key aspect of the project is to optimise the parameters for the printed part that post-machining is minimised and it can be used ideally 'hot off the oven'. The qualification will form the bedrock for future certification of critical components for marine use," said ShipParts.com's chief growth officer Roy Yap.

NYP's Additive Manufacturing Innovation Centre (AMiC) will develop the metal printing test plan, procedures and processes, facilitate testing and analysis. ShipParts.com will provide the design criteria for parts produced by 3D metal printing licensed via its consortium of manufacturing partners, while ABS will develop new testing and qualification standards and audit the manufacturing process.

Desmond Tan, centre director of NYP's AMiC, said: "We are excited to be part of this project as it has the potential to place Singapore at the forefront of the maritime industry's 3D printing hub. With NYP's vast expertise in Additive Manufacturing, we are well-placed to ensure that the quality and reliability of the parts produced are consistent and meet qualification standards."

Soh Mei Yan, business development manager, ABS Singapore said: "3D printing of metallic components has significant potential for maritime and offshore industry applications and ABS is leading this field.

"ABS has already published Guidance Notes on Additive Manufacturing to introduce a qualification scheme that defines processes with sufficient clarity to achieve consistent, repeatable results. The outcome of this research will be a comprehensive certification process."

The partners believe that the metallic AM will revolutionise the maritime and offshore sectors, paving the way for distributed manufacturing and, reduced logistics, thus contributing to global efforts to decarbonise.

"Current investment and take-up will drive cost downwards with a technology leap expected by 2022 for larger parts. There are now more material choices and more accurate 3D printing machines capable of manufacturing components in a more cost-effective way," said Yap.

Current investment and take-up will drive cost downwards with a technology leap expected by 2022 for larger parts, says ShipParts.com's Roy Yap.

"It has the capacity to manufacture parts with complex geometry and internal shapes, resulting in a significant reduction in overall lead-time," added Yap. "Another key advantage is that parts can be printed on demand, requiring little to no inventory storage. Lower inventory holding costs can be achieved."

Once the project is completed, ShipParts.com will promote the commercialisation of the technology to provide 3D printed parts to end users on their platform with NYP manufacturing and ABS certification.

Chevron launches digital solutions suite to support ship efficiency

www.chevronmarineproducts.com

Chevron Marine has launched a suite of digital solutions to support shipping's journey into a more efficient future.

Chevron Marine Cloud Solutions, including the customer order management platform OnePort launched last year, offers shipowners and operators tools with which to analyse, manage and ultimately help to improve their operational performance.

The solutions, developed under Chevron's Business Technology Innovation (BTI) initiative, are part of an on-going, multi-year digitisation investment program. They are designed to integrate seamlessly with customers' processes, meaning that users can easily adopt the tools and begin to reap the benefits of online vessel management.

Chevron Marine's e-commerce platform OnePort dramatically reduces order management time by eliminating unnecessary work from the process of lubricant procurement. The consolidation of several common supply-chain transactions such as product availability inquiries, order confirmations and delivery receipts (MLDR's) help customers to access information quickly and in a reduced time frame. Customers report seeing faster order turn around, especially over weekends and during public holidays when offices can be closed, and time differences can impact order processing.

The extended digital platform integrates data with human intelligence to enable customers to take decisions to help optimise vessel performance. Detailed asset data, including recommendations from marine technical specialists based on the analysis of used oil samples – wherever owners have taken advantage of Chevron Marine's FAST and DOT.FAST analysis services – create a full picture of the operating profile of any number of vessels in a fleet.

Steve Gormer, Chevron Marine digital enablement manger said: "The launch of OnePort marks a milestone in our digitisation journey and is just one of the ways we are leveraging technology to provide solutions-based support for our customers. By integrating data sources, from order management to technical reports, we are providing intuitive tools that offer a total view of fleet operations that, ultimately, can help keep our customers' costs to a minimum."

Chevron Marine's digital platform helps owners and operators to analyse, manage and improve operational performance.

OpenBridge launches open source design guideline for digital user interfaces

www.openbridge.no

The OpenBridge consortium has released open source design guideline for maritime digital user interfaces.

The consortium has 27 partners from academia, government and industry and is working towards simplifying integration and improving user experiences for all maritime workplaces.

According to OpenBridge, current bridges on ships are often made up of a large number of systems delivered by multiple suppliers. This has led to cluttered workplaces resulting in human error, inefficient operation and an increased need for training. The lack of standardised integration frameworks also leads to high development costs and low innovation speed, since suppliers must develop and maintain many system variations aimed at individual suppliers or ship vendors.

OpenBridge has created a maritime design system adapted to maritime use situations, modern design principles, new implementation strategies and regulations. Since current challenges in maritime workplaces span both design and technical implementation, OpenBridge will support both user interface design and technology integration.

OpenBridge is developed to support all maritime workplaces on ships and also land-based workplaces for maritime operations.

According to OpenBridge, the main aims of the design guideline are to deliver:

- Safe and efficient workplaces with consistent design across all systems regardless of supplier.
- Efficient technical integration that will allow maritime systems to be installed on all OpenBridge compatible ships bridge systems.
- A component-based approval system that works within current regulations.

The design guideline can be found at the following link https://openbridge-ds.webflow.io/

OpenBridge's design guideline aims to deliver safe and efficient workplaces.

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GreenSteam – fuel efficiency advice from digital models

GreenSteam builds digital models from historical data which can be used to provide advice to shipping companies about how to adjust speed and other factors to get the best fuel consumption. Karl Jeffery, founding editor of *Digital Ship* spoke with GreenSteam to find out more.

GreenSteam, a marine data intelligence company with offices in Denmark, the UK, and Poland, offers a service to build digital models of how a specific vessel's fuel consumption changes based on different parameters. This model can be used to give advice to seafarers about how to adjust speed or trim and when to clean the hull for optimum fuel consumption.

The company is majority owned by BP Castrol.

The software "ingests" all of the relevant available data about the ship to build the model, distilling large amounts of data into something manageable.

Typically, it needs 3 months of data to build the model, so it has data about the vessel's performance in a range of sea conditions.

Currently there are about 500 vessels on GreenSteam's platform. Half of those vessels just send noon day report data, showing the fuel consumption every over the past 24 hours, says Simon Whitford, COO of GreenSteam.

It also integrates the 24h data with high frequency AIS data and meteorological data describing the sea state, wave height, sea surface temperature, for each point of the ocean at different times during the vessel's operation.

For the most sophisticated vessels deploying GreenSteam's dynamic trim optimiser, wave height can be measured with a radar device on the bridge wing, which is more accurate than hull-mounted pressure sensors.

In this way, GreenSteam builds a model of the vessel's performance at 10 minute intervals. GreenSteam also has many vessels which automatically collect high frequency data direct from sensors – the key is being able to encompass every ship regardless of the number of sensors or the frequency of data collection – that is GreenSteam's design principle.

That said, "the quality of the model ultimately depends on the quality and frequency of the data you have," Whitford says.

Many vessels have torque meters measuring the force to rotate the shaft, taken from a sensor in the shaft. This can be used to improve the model. "We gather the data whenever we can get it," he says.

Around 70 per cent of a vessel's fuel consumption is unavoidable – what a perfectly optimised vessel on the calmest of seas would consume. A further 15 per cent of consumption is the vessel overcoming the impact of the waves and wind, and the last 15 per cent is down to vessel optimisation - the impact of fouling and trim (how the vessel sits in the water, whether the bow or stern are higher) and the speed of the vessel.

"It is a very tricky computational task to work out how fuel consumption is affected by speed or trim when these are just 2 of around 13 factors affecting the vessel which are in constant flux but splitting up or as we say, decomposing these various factors with accuracy is unavoidable to competently target vessel performance optimisation," Whitford says.

The model continually evolves as data is added.

"It ingests data, and keeps trying to find correlations, which get better over time," he says. "After a reasonable period of study – looking at the vessel's performance in many different sea states and operating parameters you get a very accurate vessel specific picture."

"For example, when it has enough data, the model has calibrated how each of the 13 factors drive vessel fuel consumption, even when (of course) there are all changing at the same time – that is why we need machine learning."

Return on investment

Whitford believes that its customers usually see a 5 x return on investment, based on the cost of subscribing to GreenSteam, and the fuel savings they achieve.

"If you are already getting data from a vessel, you don't need to make any further capital investment to use the service, you just need to start to share your data with GreenSteam."

In the past, one of the hardest tasks has been to persuade people to act on the insights that the model provides, particularly when it challenges some strongly held beliefs.

Fuel level data

The most critical piece of information is the vessel's fuel consumption.

GreenSteam is currently developing a mobile phone app which seafarers can use to easily capture fuel consumption data from the vessel and send ashore.

The app turns manual gauge data into a few kilobytes of data – which can either be sent immediately to shore or incorporated into the noon day report.

The app avoids manual reading / recording errors and timestamps consumption levels automatically.

The project is still in the testing phase. "We've tried it on 10 different variants of fuel gauge so far, at 3 major shipping companies," Whitford says. "Some of the gauges are dirty, we want to prove that it's a robust solution."

It can also be used to reduce intentional and unintentional misreading of the fuel gauge.

Trim advice

GreenSteam's trim optimiser can advise the seafarer how the trim could be adjusted to get the best fuel consumption.

Trim can be described as the "slant" of the vessel – whether the stern is sitting higher than the bow of the ship in the water, or the opposite.

The trim can be measured on the ship either using a "trim sensor", which compares the water pressure beneath the bow and beneath the stern or with sensor equipment mounted in the vessel.

In some vessels, the trim of the vessel can be automatically adjusted from the bridge, by shifting ballast water fore or aft.

GreenSteam is able to train its vessel specific model to learn how the fuel consumption varies with different trim, also taking into consideration the loading of the vessel (and so the draft).

There is a "pre-departure" trim planner, which can calculate the best trim for the specific vessel before you depart, based on the draft (cargo loading) and vessel speed.

GreenSteam has also developed a system somewhat akin to autonomous vehicle technology which, when deployed onboard captures high frequency performance data and integrates this with the vessel's digital model to continually assess the most optimal trim for the vessel – this is called "dynamic trim optimiser". The vessel's trim is adjusted during the voyage, by transferring ballast fore and aft from the bridge.

The master has a visual display showing whether the vessel is in the "green" or "red" zone, empowering the vessel to optimise each voyage in near real time.

Better alerting

GreenSteam's software generates a range of "alerts" direct to the vessel in near real time. A basic alert might inform the vessel crew that the last 6 hours average fuel consumption has strayed outside an expected range. It can be sent to the captain as an e-mail, with a link to see further insights. "We call those regular alerts," Whitfield says.

Whilst this is useful, the problem with so-called regular alerts is that there may be a simple reason for the higher fuel consumption, such as strong winds. So, we risk distracting the "time-starved" crew with too many alerts, sometimes just telling the Captain something he or she already knows.

By the end of 2020, GreenSteam plans to produce "smart alerts".

A "smart alert" would only send an alert to a vessel when there is something useful to say, a specific actionable and useful change they can make.

"For example, it could indicate, "if you were to adjust your speed by this much, or adjust your trim by this much, you can still make your arrival laycan, but you will cut your fuel consumption this much," Whitford explains.

The alerts rely on the latest developments in GreenSteam's machine learning platform and can be configured for the various needs of people in different roles, such as the vessel operator and technical manager.

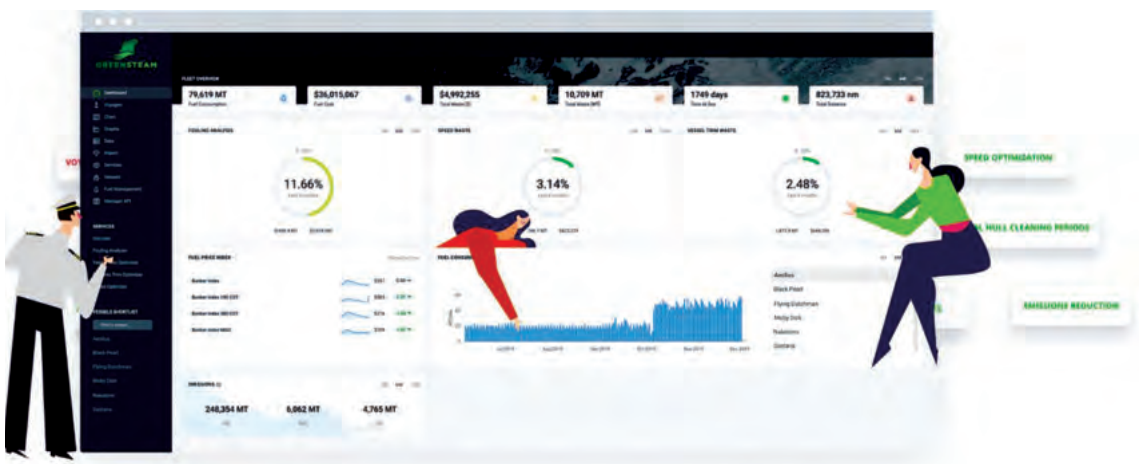
Longer term decisions

The data in GreenSteam's models can also be helpful in longer term evaluations such as measuring fuel consumption by exhaust gas scrubbers.

Scrubbers will consume fuel, usually 1-3 per cent of the fuel required for vessel propulsion.

Whitford says that based on his discussions with shipping companies in Greece on a trip held in January 2020, companies can see a price differential between heavy fuel and low sulphur fuel emerging of $350 per ton.

"If you believe this differential will continue for the next decade and know how much a scrubber will cost to build, you can see whether it would be a good investment." DS



GreenSteam's platform gathers all performance data already obtained from a vessel and uses machine learning to analyse and provide accurate insights. Image courtesy of GreenSteam.

How Tritan Software is helping shipping companies to manage the COVID-19 outbreak

While the outbreak of COVID-19 is halting many operations, the maritime industry is continuing business as usual. The health and safety of these organisations is of utmost importance at this critical time. *Digital Ship* spoke with Tritan to find out more.

One company headquartered in Miami, United States, is helping companies to cope with and manage the COVID-19 outbreak by providing fleetwide visibility on all critical information regarding the health, safety and compliance of the organisation.

Tritan Software Corporation offers a range of platforms and solutions that operate within limited connectivity environments, utilising minimal bandwidth and advance synchronisation algorithms for functions such as virtual medical consults, injury tracking, wellness, public health, inventory and medical referrals.

With the current outbreak of COVID-19, Tritan is providing additional features and support to its clients to help manage outbreaks, perform contact tracing, isolation and issue critical notifications to all required personnel.

One solution offered by Tritan is the SeaCare Health Platform, which enables customers to manage every aspect of their medical operations while connecting with services and information across their entire fleet of ships, crew members and medical providers. According to Tritan, this industry-specific solution enables efficient processes and improved management visibility and control, while mitigating the high risks and costs involved with overseeing medical operations.

SeaCare provides customers with access to every aspect of their medical operations while connecting with services and information across their entire fleet of ships, crew members and medical providers.

A particularly important function of SeaCare at this current time is the Global Fleet Dashboard that enables combined vessel visibility from anywhere in the world through one centralised view of the entire organisation's activities and medical operation indicators in real-time. SeaCare also deploys a VirtualConsult capability that utilises minimal bandwidth and IT support to enable real-time collaboration with third-party medical specialists and a myriad of services such as; medical advice, COVID-19 support, medical evacuation and shoreside case management under one platform.

"We are seeing a tremendous need on the commercial side of the industry, which has little-to-nothing in place to manage significant or routine health events. Given the recent pandemic and increasing regulations, organisations can no longer afford to put their fleets at risk. They need the right tools," Andrew Carricarte, president CEO of Tritan Software explained to *Digital Ship*.

SeaCare uses a GDPR and HIPAA compliant Centralised Health Record, which also ensures compliance with the Maritime Labour Convention, to allow for one centralised health record, accessible onboard and shoreside, which follows the crew member throughout employment. Tritan also works directly with numerous international health agencies to help facilitate the compliance and reporting required by law for maritime vessels.

The platform is a culmination of over five years and millions of dollars in research and development involving the industry leading experts including medical directors, risk management executives, public health officials, compliance specialists and technology innovators. "The maritime world has changed. Health and safety events, now more than ever, have a direct impact on fleet and financial operations. This new era of innovation is long overdue and we intend to make this our contribution to the industry," Carricarte stated.

Given the current state of the industry, Tritan appears well positioned to assist vessel managers and operators through these challenges which they believe will positively affect the health and safety of life at sea. Some of Tritan's current customers include over 95 per cent of cruise lines with a rapidly expanding presence in the commercial segments including some of the world's largest ship managers and operators. **DS**

StratumFive launches collaborative workspace

www.stratumfive.com

StratumFive has launched Podium, a collaborative workspace that connects applications, data, and people, across the maritime community.

Podium connects any data source or third-party application and integrates them within its timeline architecture. Users can quickly visualise correlated data streams in an agile dashboard environment, transforming operational decision-making, in a flexible and collaborative workspace.

Powerful features and configurability allow users across an enterprise to easily build their own dashboards, customised data mapping, interactive displays and alerts, from any location. This enables owners, operators and managers to streamline and standardise the data they use, whilst reducing costs by discarding duplicate data sets.

Podium ingests, unifies and visualises billions of data points and scales to accommodate user demands and data volumes, whilst maintaining complete consistency in terms of output for all users.

In addition, the Podium partnership program will enable start-ups and existing digital providers to expand their maritime presence easily by accessing StratumFive's global client base, data holdings and technical infrastructure.

Podium launches with a series of in-house options including voyage monitoring, weather routing and StratumFive's next generation compliance and tracking applications.

"With many years spent in operations around the world, I have been frustrated by the inefficiencies and costs caused by poor data acquisition, processing and communication across applications and stakeholders," said Mike Powell, strategy director, StratumFive.

"Until now, digitalisation has often made things worse for people working on ships and at shore, as increasing enterprise-wide data and information demands require too much manual intervention and effort. Currently, high levels of activity do not always equal productivity.

"Podium is designed to be the workspace for the whole enterprise, linking data and applications, ensuring all stakeholders not only start from the same page, but also have the tools they need to maximise the efficiency and value of their part of the voyage."

Podium connects any data source or third-party application and integrates them within its timeline architecture.

NAVTOR confirms 6,000 vessels using its PAYS service since 2012 launch

Eight years ago, e-Navigation specialist NAVTOR signed its first customer, launching the concept of Pay As You Sail (PAYS) ENC subscription to the global marketplace. The customer was Havila Shipping and the vessel PAYS set sail with, the Havila Clipper, is still using the same solution today. Since then, nearly 6,000 vessels have subscribed to e-Navigation solutions from NAVTOR.

CCO Børge Hetland said it has been, "An exciting journey and the Havila Clipper marked the first step on the way."

In 2012 when Havila signed the contract for NAVTOR's e-Navigation solution, PAYS was a breakthrough technology in e-Navigation. Up until that point, vessels had to agree to traditional subscription models, based on set ENC cells and time scales. This was convenient for ships sailing set routes, but problematic for those with more erratic operational patterns.

NAVTOR's PAYS only levied charges for the charts navigators actually used during voyages, while allowing them to instantly access any chart for planning. It was flexible, transparent (with users and managers seeing exactly what they are paying for) user-friendly, and very cost effective.

"In an increasingly competitive business environment, it allowed, and still allows, our customers to keep track of operational expenditure and, with its easy management and seamless updating, slash the burden of administration. In short, it is simple, efficient, safe, compliant, and delivers optimal business and operational value," stated Hetland.

Havila Shipping was the first customer to sign up to NAVTOR's PAYS set sail service in 2012.

"That has proved to be a very attractive proposition, with over 70 per cent of our customers now opting for PAYS over traditional ENC subscriptions."

According to Andrè Tarberg, purchase manager at Havila Shipping, back in 2012 the firm was keen to simplify the management of it navigational charts, reduce navigator workloads and optimise costs.

"Our vessels don't just sail from point A to B every day, so subscribing to ENCs according to set ENC cells and timescales was both complex and expensive. We wanted to find a solution where we'd only need to access and pay for the charts we actually ended up sailing with, while simplifying the whole process. When NAVTOR knocked on our door with exactly that it was easy to say yes."

PAYS was tested out on the Havila Clipper, with the feedback it was easy to install and use, especially in terms of updating and compliance – with traditional ordering and installation of charts on CDs being replaced by seamlessly updated ENCs delivered via the NavStick device.

"Suddenly the headache of ENC management was cured," continued Tarberg. "Navigational life onboard the Clipper was transformed and, once we had experienced that proof of concept first-hand, it wasn't a difficult decision to act and spread those benefits further."

All ships within the Havila fleet operate with NAVTOR PAYS today.

"It's hugely gratifying that Havila have stayed with NAVTOR through the course of our development," continues Hetland. "They are our first and longest customer, and it's been a close collaboration that has helped build our understanding of market demands and how to meet them."

"We see e-Navigation as about far more than digital charts. Through continual innovation and the seamless sharing of information between vessels and shore we can use it as the foundation for a new era of smarter shipping. By adding new functionalities and really harnessing the power of our customers' data we can help them achieve greater efficiency, enhanced safety, reduced costs, diminished environmental impact, and, in doing so, a more sustainable shipping industry, with increased predictability and optimal decision-making," concluded Hetland. DS

GNS launches Voyager FLEET INSIGHT extension and makes service free to shipping

www.gnsworldwide.com

GNS has launched VFI Plus, a new extension to its Voyager FLEET INSIGHT (VFI) web service and, at the same time, announced that it will be making the service available free of charge during the COVID-19 pandemic. This aims to support shipping companies with remote-working or office-based teams with increased demands for fast access to up-to-date information.

VFI Plus is the most advanced web tool GNS has put in the hands of its customers; enabling vessels to be remotely managed and monitored from shore in ways never before possible over the internet on a single platform.

One of the challenges for remote-working teams is not having access to data quickly enough. In addition, the COVID-19 virus is creating unique set of operational challenges that demand better access to information about vessel locations and their maritime environment.

Designed to put more information in the hands of shore-based ship management and improve operational oversight and vessel safety, GNS's new VFI Plus service features the ability to view live vessel positions on C-MAP charts, overlay current and forecast weather conditions, display MARPOL zones and view all nearby vessels within a user-defined distance. As a result of GNS's collaboration with maritime security experts Risk Intelligence, VFI Plus also introduces the ability for users to view the latest maritime security issues globally, together with the option to also access premium detailed seaborne and port-related risk information.

"We want to help those who are involved in managing shipping activities during this unprecedented period to do their jobs as effectively as possible," said Kent Lee, CEO, GNS Ltd "with the ability to view both up-to-date vessel positions overlaid on charts, maritime weather, maritime security and MARPOL. VFI Plus is the ideal service to help customers during these challenging times that will enable better operational oversight, enhanced collaboration between vessel and shore that lead to more informed decision-making. In addition, the opportunity to also access official AVCS charts online, elevates the system further and makes this the most comprehensive set of vessel management features ever offered in a single web-based system."

For shipping companies that demand the highest levels of operational safety and risk management, the ability to view exactly the same chart information as the vessels in their fleet are using for primary navigation is increasingly important. VFI Plus is also one of the first web services to offer access to the ADMIRALTY Vector Chart Service (AVCS) Online service as a premium service. This enables users to display vessel positions alongside other information, including weather and MARPOL zones, on the UK Hydrographic Office's official AVCS ENCs and view the ADMIRALTY Information Overlay.

VFI Plus is an advanced web tool by GNS that enables vessels to be remotely managed and monitored from shore over the internet on a single platform.

For personnel managing vessels in remote locations, dealing with shipping incidents or investigating alleged regulatory violations, VFI Plus's unique 'go back in time' facility provides an invaluable new resource. The feature leverages GNS's huge maritime data assets to enables users to view vessel positions for specific dates and times as far back as 2015 and verify vessel's historic positions, routes and activities in the context of other nearby craft, MARPOL areas and other key features of the maritime environment such as fish farms and submarine cables.

VFI Plus is available free of charge during the COVID-19 crisis to all shipping companies irrespective of whether they purchase navigational products from GNS or not.

Listen to the sea

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www.posidonia-events.com

MAN Energy Solutions – a new data collaboration platform for all types of connected equipment

MAN Energy Solutions has launched a platform "mýa" to enable integration of live data streams from sensors on engines, turbines and any connected equipment, which will be spun out in an independent company. Karl Jeffery, founding editor of *Digital Ship* found out more.

MAN Energy Solutions (MAN ES) has launched a digital platform "mýa", to share, integrate and distribute streaming data originating from sensors on equipment such as engines. The mýa platform will form the offering of an independent company, with other companies, including competitors, invited to join and share ownership.

The purpose of mýa is to act as a broker of live data, a data collaboration platform, facilitating the integration of data streams from different sources, regardless of the manufacturer of the equipment, enabling a view of the total ecosystem with inter-relationships and dependencies.

In one example, equipment associated with engines can include pumps, fluid monitors, generators, compressors, turbines and emission controls.

Sensor data comes with a time stamp, time series data (the time the data reading was taken.) Sensors on different pieces of equipment might record data at different intervals and quantities, but are typically time stamped. mýa can align all the time stamps, so you know what all the sensors were recording at a single point in time. This is essential if you want to analyse the data together and look at a complete view of the combined system.

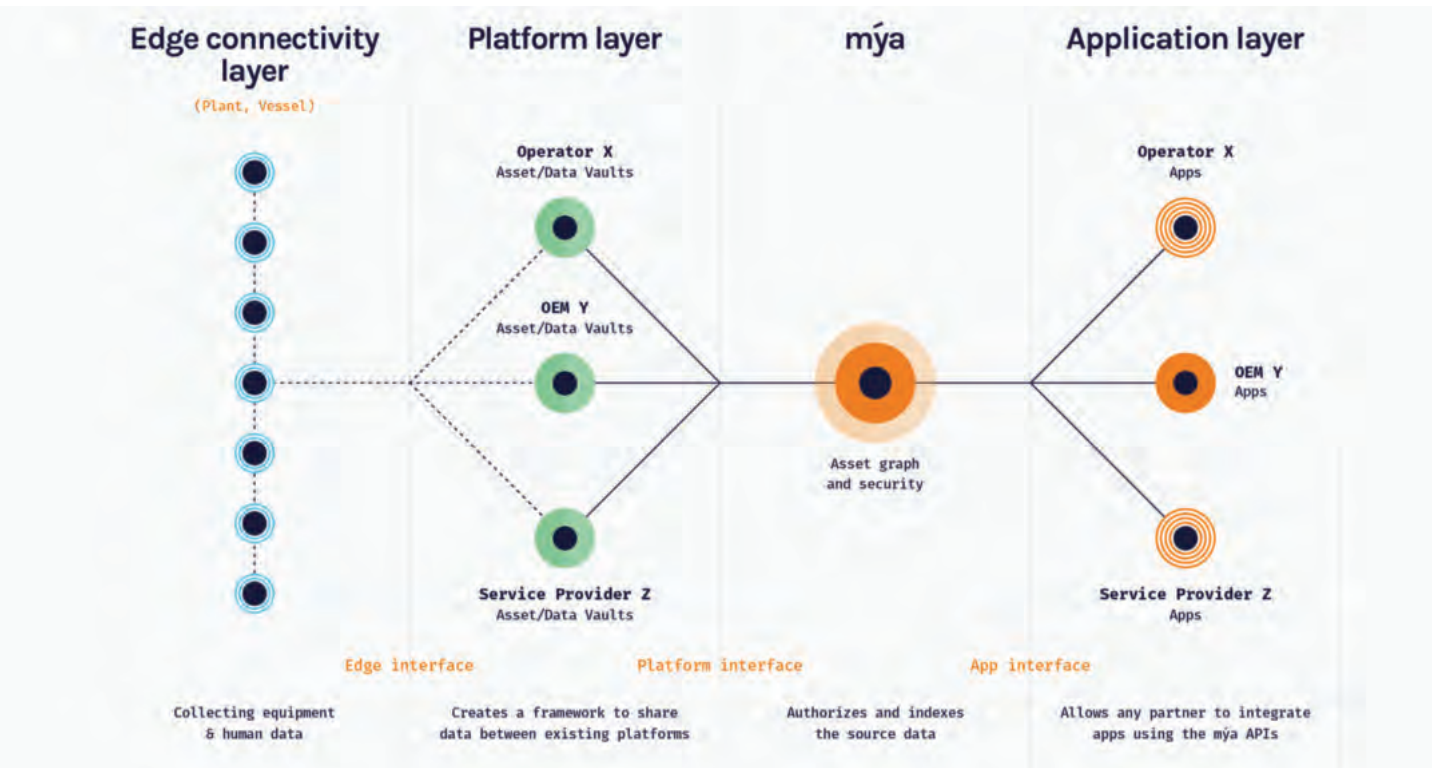
Mýa does not store any of the data, only meta data (such as the volume of data handled). All data is owned by the asset owner unless agreed otherwise, and any data collaboration is controlled via contacts and agreements.

In this way, mýa could be seen as a plumbing system for data from different systems and different partners.

Right now, if a shipping company wants to work with sensor data from equipment from different manufacturers, it is really difficult. This could be analogous to the hassle of having to go to a street stand pipe to collect your drinking water in the 1800s. mýa is the equivalent of making drinking water available to you on demand through a tap, together with gas, which can be combined to make hot water, in your house, provided with a standard fitting you can easily connect your boiler to.

From its own products

The initiative of mýa, originated in the digital department of MAN ES, which was building "tools" to monitor and maintain the performance of products such as large engines and turbines in operation in the field, and recognised the need for data collaboration and standardisation, across industries such as marine, power plant and oil and gas refinery applications, where its products operate today.



MAN ES' digital solutions platform mýa.

MAN ES has its own asset performance platform, MAN CEON, which powers MAN PrimeServ Assist, a solution to optimise operational performance of equipment in service.

This means that the investment MAN made into developing a parallel platform for its own purposes, is now being made available to others.

Today if you use MAN´s PrimeServ Assist you are actually using the mýa service, which is operating in the background.

Inviting others

MAN ES is inviting other manufacturers, including competitors, to take ownership and join the board of mýa. It is ultimately seeking to have 5 to 10 owners, and thousands of members OEMs and asset owners alike, from all types of industry, not just engine or turbine related. "The aim is to give the control totally to the non-profit-making organisation," says Dr Alan Atkins, CEO of mýa Connection.

Companies who are competitors to MAN ES might say, "We would like to join but we would also like to have a say in what's being done." Be being one of the founders, this is absolutely possible and encouraged.

Discussions are ongoing with major equipment manufacturers who work closely with MAN, and also with competitors.

The costs of running the platform will be shared by the founders – but Dr Atkins emphasises that these are not so high – the organisation will only develop the basic functionalities. It will just administer the service and ensure uptime and security. "Applications" and analytics, will be developed where required by the members and third parties as required.

If companies decided they did not want to stop working with mýa at any time, they would not lose access to any data streams, just the integration service which mýa provides.

MAN ES has formed a new company, mýa Connection GmbH, as the vehicle to move forward, with the intention to form a separate independent non-profit making organisation during 2020.

Setting up mýa as a legal entity proved quite complex, including managing some anti-trust issues involved with having competitors working together. But now, "it is open to everybody," he said. "Including MAN ES' biggest competitors, in fact I would welcome that."

Dr Alan Atkins, CEO of mýa Connection GmbH and mýa Foundation, has a long career working in the "machine to machine" sector, including a role as global head of M2M/IoT with consulting giant CGI, then VP and global head of IOT with Wipro, one of the world´s biggest IT and services companies.

"We already have a platform"

One of the common reactions when asked about joining mýa, Dr Atkins says, is equipment companies (OEMs) saying they "already have a platform."

But for most equipment companies, their "platform" is simply a means for them to handle their equipment sensor data to a cloud system where they monitor and predict performance of that specific piece of equipment, he says.

mýa can add value to this by integrating their existing cloud hosted data with data from other equipment companies, to be able to look at the total system view. So, it is not in competition with other proprietary platforms, but a supplement and an enabler.

One login

In the short term, the biggest benefit might be that shipping superintendents for example, only need to log in once online to see data from all their equipment from multiple manufacturers, integrated together.

"One of the ship fleet owners has said, I'm so fed up of 20 different reports from different pieces of equipment and not being able to compare the data in one go to obtain a system view," Dr Atkins says.

"When I talk to technical services within OEM organisations, offering after sales services to clients, they say this is great, this is what clients really want. A way to communicate between different platforms without being locked into a commercial third party´s offering."

With this integrated view, you can monitor all the alarms across all of your assets – the status of different engines, running speed, exhaust gases, your pump performance, scrubber performance, and other data you might want to monitor.

When viewing the assets within mýa, you are able to switch views to the OEM´s own asset view and access their applications and graphical representations without having to login again. You don't need

to manage lots of different passwords. Authentication has already been carried in the various OEM systems. This provides the user with a single pane of glass.

Some shipping companies are already encouraging their suppliers to make data available through the system because it makes their life easier, Dr Atkins says.

Equipment as a system

Building on this, one of the biggest areas for potential value from mýa is in how it enables shipping companies, for example, to look at their equipment as a system, rather than as a collection of individual components.

There are many dependencies between equipment. For example, a slowing down pump will mean a reduced flow rate in a pipeline, which will have an impact on whatever is downstream. A gradual loss of performance somewhere can have an impact somewhere else.

Also, if you might want to monitor the performance of a whole system. On a ship, for example, you might want to monitor the entire propulsion system, which includes the torque on the shaft, the speed through water, as well as sensor readings from the engine itself.

The platform was designed to integrate the various data streams, enabling people to do analytics at a "higher" level. It also allows a view across multiple "systems" such as a fleet of ships or power plants.

Analytics and apps

The platform can form a basis for analytics. Shipping companies, suppliers and other software companies can build tools to generate useful insights from the data.

Data is still owned and controlled by shipping companies, power generator etc, as the asset owner, but they can see it is in their interest to allow access to it by other companies.

For example, apps could be built enabling shipping companies to monitor vessel performance, and support decision making about the best time to do maintenance or replace components, or get early warning about emerging problems, with alerts.

The app could incorporate other data, such as vessel position (from AIS) or weather data. This way, you can get more 'context' to the equipment sensor data – such as showing that the engine was working harder because there were high waves.

mýa works with about 80 standard open APIs, and can provide API keys, so it is possible for a third party software company to be able to integrate with the data given the necessary permission by the data owner, the asset owner.

The service itself could help drive more use of data standards and standard KPIs across the industry.

Supplier engagement

The platform can provide ways for suppliers to become more engaged with their customers during the product lifecycle.

Suppliers can monitor the performance of their products in use, and use their enhanced knowledge of how their products operate, to give customers advice.

They can also monitor the performance of their installed base of products across multiple customers, to better understand, for example, how their equipment wears and where improvements in design could be made.

The data can support selling spare parts and other "aftermarket" services at the right time, generating increase availability and up-time.

Satcoms and telecoms

Technical advancements in the availability of higher bandwidths with cost effective data plans, is enabling better control and efficiencies of remote assets and in turn, lower emissions.

Data communications from ships can be made over a satellite communications link, or perhaps mobile data when close to the shore.

Better and cheaper satellite communications make it possible to have live time series data from equipment, rather than just uploading data when a vessel enters port.

Investments by the Telecommunication and satellite providers have been key to enable communication with remote assets and enabling real time control and monitoring. Although seen sometimes as just a communication pipe, availability, quality of service and security is all part of a complex offering.

We must remember that machine to machine communications have been around for over 50 years – with one of the first examples being a fax machine which could automatically say it is running out of ink, Dr Atkins says. We are just moving on in the world of remote control and monitoring which we all hope will lead to better efficiencies, reduced emissions and standardisation providing economies of scale. DS

StormGeo and DNV GL sign MoU to accelerate maritime data sharing

www.dnvgl.com
www.stormgeo.com

StormGeo and DNV GL have signed a Memorandum of Understanding (MoU) to drive digitalisation and data standardisation in the maritime industry.

In the MoU, both parties aim to strengthen the presence and integration of StormGeo's fleet performance management and weather intelligence solutions on DNV GL's independent data platform, Veracity. This will give StormGeo's customers an enhanced service offering, helping them to further optimise the operations of their fleet. Veracity users will benefit from easy integration of StormGeo's weather intelligence services that can be accessed on the Veracity Marketplace.

"We are very happy to deepen the partnership with DNV GL to make data sharing for our clients even easier," said Thilo Dückert, StormGeo VP, fleet performance management. "Today StormGeo offers an integrated solution to span navigation and voyage planning, weather routing and fleet performance management. We believe this partnership signals the industry that we intend to further enhance our service portfolio to help clients improve safety and fuel efficiency of their vessels."

DNV GL's Veracity platform.

NAPA adds data analysis expertise to MOL project

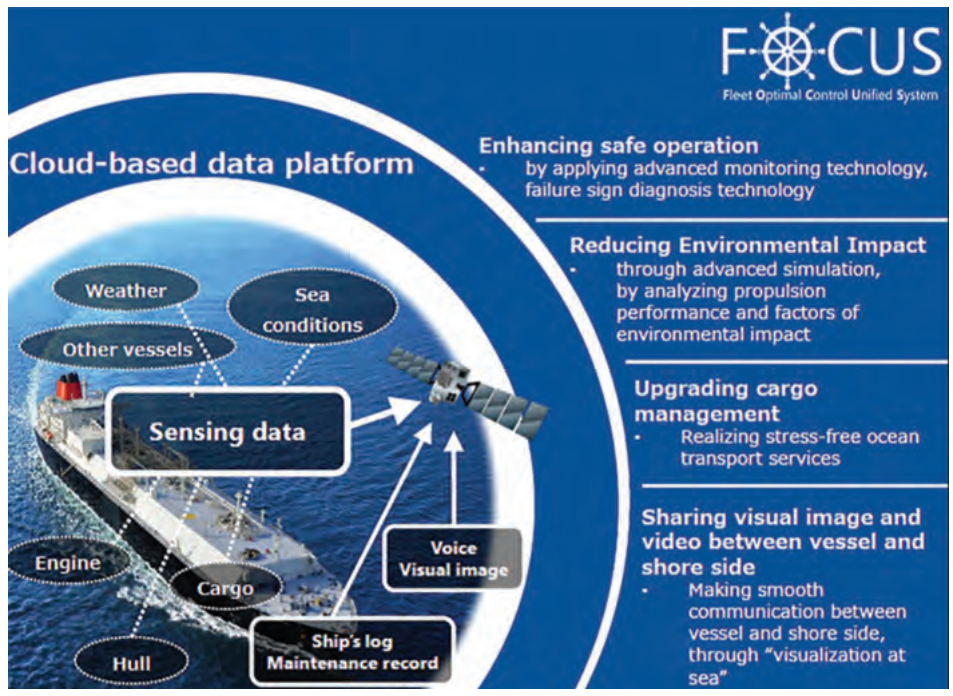
www.napa.fi
www.mol.co.jp

NAPA has joined Mitsui O.S.K. Lines' (MOL's) Fleet Optimal Control Unified System (FOCUS) project for enhancing the collection and application of ship operation data.

FOCUS is a multi-year project developed by MOL with the aim of applying its operational data to develop digital applications that enhance the safe operation of its fleet and reduce its environmental impact. Additional partners include Mitsui E & S Shipbuilding and Weathernews.

As part of FOCUS, NAPA will develop various safety and environmental applications, combining its hydrodynamic modelling expertise with big data solutions.

"We are proud to have been selected by MOL for this project and are excited to become a part of FOCUS. The clock is already counting down for shipping to drastically reduce its carbon footprint by 2050, therefore we need to start collaborating now to develop the solutions that will get us where we need to be, while ensuring that safety remains a top priority and continues to improve. From working with MOL for many years, we have demonstrated how NAPA's combination of ship modelling and big data expertise can deliver results across a range of vessel types, regardless of onboard hardware. We are looking forward to working as part of FOCUS to create a new generation of solutions," commented Naoki Mizutani, executive vice president of NAPA Shipping Solutions, at NAPA.



MOL launched the Fleet Optimal Control Unified System (FOCUS) project in October 2018. The aim of the project is to gather and apply ship operation data to ensure safer, more environmentally friendly ocean transport. Image courtesy of MOL.

GTMaritime gives Rocktree a rock-solid platform for data transfer

A need for reliable data synchronisation over multiple systems first led Rocktree to GTMaritime, but the floating terminal operator now has much larger digital ambitions in its sights.

With a fleet of six Offshore Floating Terminals (OFT), the Singapore-based transhipment company specialises in the offshore loading of dry-bulk products from barges to bulk carriers at ports with draught restrictions and/or infrastructure limitations.

Essentially, an OFT performs the same functions as a permanent land-based terminal but this approach is considerably less capital intensive, quicker to design, construct and mobilise than a fixed terminal. And in an age of growing environmental concern, the OFT has a measurably smaller impact on local marine and coastal ecosystems, requiring limited or no dredging before opening for service.

Rocktree OFTs have allowed its clients to bypass the infrastructure challenges associated with ports in emerging markets. Even where infrastructure is not an issue, they provide a fast and cost-effective alternative to ports subject to draft restrictions. Currently, these floating terminals have some 30 workstations and services running onboard.

Rocktree relies on Office365 email and a host of enterprise-grade software for maintenance planning and compliance, safety and accountability in its operations. It is also exploring the possibilities of Internet-of-Things (IoT) solutions as it seeks to reduce downtime and maximise the productivity of its assets.

Yet, while its OFTs are moored close to the shore, they have often struggled to get online when using internet and WIFI services from land-based ISPs. This is largely due to the location and signal strength of the local communications infrastructure. The problem was solved when Rocktree rolled out satellite based VSAT systems onboard its OFTs to handle data exchange across a VPN tunnel between its sites and its headquarters in Singapore.

However, the migration from patchy land-based telecoms to satellite brought its own set of challenges. For example, real-time data handshakes between the planned maintenance system did not work efficiently and the IT team often had to intervene and manually transfer data ashore. An in-house developed fix for the problem did not perform reliably enough for personnel to feel comfortable leaving the system unattended.

Rocktree's IT and technical teams set about researching the market for a more effective and lasting data communication solution, with recommendations from its own employees and trusted IT vendors resulting in a decision to implement a package solution from GTMaritime, comprising GTMailPlus, GTSentinel Antivirus and GTRAFT. The latter allows data file transfer, remote folder synchronisation and system monitoring to be fully automated and controlled centrally, removing the need for input from the crew.

Initial planning and preparation for the roll-out started in November 2018. With assistance from GTMaritime's technical support team and an experienced vendor, Precision Infocomm, everything was up and running within just six months. By June 2019 the system went live and Rocktree was successfully delivering mail through GTMailPlus and replicating data between the maintenance, quality assurance and other systems unattended through GTRAFT.

While cost-saving was not an explicit goal of the project, Rocktree believes the migration to GTMaritime has paid for itself many times over in man-hours and stress saved when compared to manually transferring data, as well as allowing the company's applications to operate as they should.

A reliable, robust and easy-to-manage solution helps across the company, de-stressing the IT and technical teams by relieving them of the pressure of having to drop everything and intervene to carry out what should be routine data synchronisation. Moreover, the ability to monitor the status of all its OFTs from a single unified dashboard makes managing updates and workflow more straightforward and less resource intensive than was previously the case.

The reaction from HSEQ, crewing, procurement and other operational and back-office functions needed to keep Rocktree's OFTs ticking over has also been overwhelmingly positive.

"Working closely with the team at GTMaritime allowed us to roll out the full solution quickly and efficiently" says Zoeb Patrawala, senior manager digital technology and solutions at Rocktree. "This has meant that staff has been able to experience the benefits straight away, saving time and costs as well as simplifying the process to easily and centrally manage all the File Transfer jobs."

Although Rocktree initially approached GTMaritime to solve a specific challenge – namely, unattended data synchronisation – it is now carrying out a comprehensive review of its IT strategy with a view to extracting the full potential of what GTMaritime solutions have to offer.

One idea currently on the table is to send images from the nine CCTV cameras fitted on each OFT back to its Singapore headquarters. Apart from transforming the oversight and accountability the company can provide to its clients, this would allow management staff to take a more proactive role in responding to unexpected and rapidly unfolding situations.

Looking further ahead, Rocktree sees considerable potential in adopting IoT solutions coupled with advanced data analytics to further optimise the operation of its floating terminals. Because releasing the value of such technologies depends on ubiquitous connectivity allowing an almost constant stream of data to flow between vessels, shore and the cloud, such investments can only be justified if a resilient communications infrastructure is in place. With GTMaritime as its long-term partner, Rocktree believes that condition has been met.

Key benefits GTMaritime brings to Rocktree

- Hassle-free, resilient vessel/shore communication
- Reliable data replication with minimal manual intervention
- Enhanced visibility on network status across the fleet
- Straightforward installation of systems on newly acquired vessels

DS

RT Genova is a 2012 built Supramax size self-discharging vessel, capable of providing transhipment services with an average net loading rate of 72,000 tonnes per day. Image courtesy of Rocktree.

Wärtsilä & DNV GL collaborate to accelerate marine digital transformation

www.dnvgl.com
www.wartsila.com

Wärtsilä and DNV GL have signed a Memorandum of Understanding (MoU) to work together to contribute to the marine industry's ongoing digital transformation.

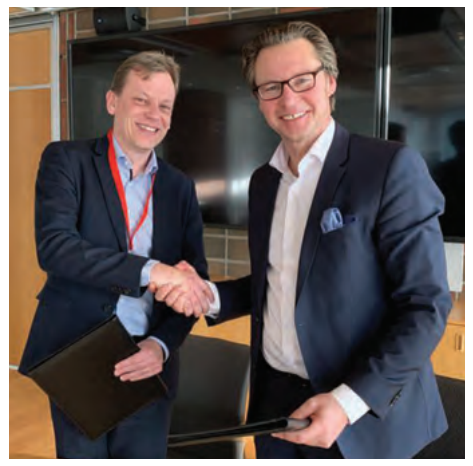
Among the focus areas will be collaboration on digital technologies and big data in classification and the requirements for their use. The project will examine the application of these technologies in areas such as autonomous ships, advanced remote services, new bridge technologies, and data sharing. Cybersecurity will be another natural area of cooperation.

The agreement was signed by Roger Holm, president, Wärtsilä Marine and Knut Ørbeck-Nilssen, CEO, DNV GL – Maritime on February 6, 2020.

"The marine industry stands to benefit enormously from our rapidly expanding and unprecedented capabilities in collecting, compiling, processing, analysing, and distributing data digitally. Wärtsilä is committed to leading this digital transformation that will undoubtedly lead to greater efficiencies, better safety, and sustainability. We look forward to working with DNV GL to accelerate this transformation," said Mr Holm.

"At DNV GL, we are committed to using digitalisation to help our customers extract the maximum value from their data," said Mr Ørbeck-Nilssen. "Working together with Wärtsilä, we can identify and minimize the barriers to data sharing, provide innovative class and assurance services, and find ways to capitalise on the new possibilities this opens up for shipping. Enabling greater sharing requires building trust, and DNV GL has worked to enable this, for example with our independent platform Veracity which provides seamless sharing, while ensuring the quality of data and algorithms our customers rely on."

In announcing the agreement, the two companies noted that digital transformation developments can have an immediate and transformative impact on operations and existing business models.



Roger Holm, president, Wärtsilä Marine and Knut Ørbeck-Nilssen, CEO, DNV GL – Maritime.

Better ways to manage shipboard maintenance

The German research institution Fraunhofer Centre for Maritime Logistics and Services CML is developing software tools, which can make shipboard maintenance much easier to manage, including integrating maintenance work with crew scheduling systems and making it easier to implement condition-based maintenance, writes Karl Jeffery, founding editor of *Digital Ship*.

SCEDAS is a decision-support system that assists fleet personnel managers by calculating a detailed assessment of the required crew consistency, including to stay on time, within budget and compliant with regulations. Image courtesy of Fraunhofer.

The German research institution Fraunhofer Centre for Maritime Logistics and Services CML, part of Europe's application-oriented research organisation Fraunhofer Gesellschaft, is developing software tools to make shipboard maintenance easier for shipping companies to manage.

New developments include the integration of maintenance planning into crew scheduling, and finding better ways to make a move to condition-based maintenance.

The maritime industry has the unique trait that the same crew is responsible for both operating and maintaining the vessel. Consequently, maintenance management is closely intertwined with crew management.

Meanwhile shipping companies have the challenge of having to distribute the workload according to the vessel's voyage. There is only so much crew time available, and crew have other priorities.

It is a challenge to take the interdependencies between maintenance, operational and crew management into account when managing a ship.

Current maintenance strategies

Currently, shipboard maintenance is usually 'planned' – done according to specific intervals, either in time or in operating hours. Maintenance intervals are usually defined through presumption of the equipment's expected lifespan, which does not consider the current condition in the course of ship operation, Fraunhofer says.

However, unforeseen changes in the equipment's condition may lead to outdated maintenance intervals. It means people are doing maintenance they don't need to do, or doing too much 'unplanned' maintenance (fixing something which has broken). Also, this is not a maintenance strategy geared around getting the most out of the equipment – allowing it to run as long as possible without maintenance.

With condition-based maintenance, the maintenance intervals are dependent on the equipment's condition. The equipment is continuously monitored, for example for temperature, vibration and sound (acoustics). Condition based maintenance software tools use this data to predict the equipment' remaining lifetime and derive an appropriate maintenance interval.

One important component of maintenance management is a so-called "Planned Maintenance System". It is a software onboard the vessel providing a central overview of relevant maintenance tasks. It serves as a central communications platform for technical matters.

These software tools are becoming more and more integrated with other software tools, such as procurement and purchasing systems, and safety and quality systems.

Some of these systems support analysis for condition monitoring, such as visualisation of sensor data, and tools to monitor if any of the data has passed a pre-defined threshold, such as a plan to do maintenance work if the noise goes above a certain level.

Integrating maintenance planning into crew scheduling

Fraunhofer CML is developing ways to integrate maintenance scheduling into crew and voyage planning systems, by making an interface between the various software packages.

Fraunhofer CML's software SCEDAS can help shipping companies assess the ideal number of crew members onboard and computes an optimised work schedule. For a specified voyage and ship, it maps the operational and maintenance work to the available crew time. It takes into account crew qualifications, voyage specific dependencies and rest hour regulations.

Relevant maintenance tasks are read out of the Planned Maintenance System of the shipping company and included in the SCEDAS work schedule. The system assigns maintenance tasks to available crew time, taking into account the maintenance intervals and prioritisation.

The system requires a list of all the tasks that arise during ship operation, and a list of the crew's qualifications.

Matching the tasks with the available crew is tricky, even with a computer, because you don't want to set the bar too high of what qualifications are needed to do a certain task.

The tasks can also be associated to different ship "operating states", for example saying that certain tasks are better done during a port stay, transit, berthing or pilot takeover.

You can enter alternatives, such as "if the bosun is unavailable, the pump-man can execute the task."

The system has been tested on both merchant ships and cruise ships.

Benefits of united maintenance and crew scheduling

The software SCEDAS is a scheduling tool that respects the operational and voyage specific workload in combination with maintenance. It can be used to assess how much a management decision will affect its total crew demand.

You can experiment with different "qualification requirements" (i.e. which crew need to do a certain task) to see the impact on the crew demand.

One the one hand, this makes it possible to quantify the impact of changes in maintenance strategies on the crew demand. On the other hand, it is possible to see the effect of the voyage and its resulting workload to the feasibility of maintenance work within the available crew time. You can compare different maintenance strategies before implementing them on board.

The tool can be used both in the office and onboard the vessel. On board maintenance scheduling can be very useful when associated with condition-based maintenance, where you may need to change your working plan due to a change in the condition of a certain piece of equipment.

You can also use the software to make decisions about whether to bring in external service providers, or if there are better ways to bundle certain maintenance tasks together.

To make the system work, you need standardised management of maintenance data across the fleet. Keeping maintenance data harmonised is much easier if all data across the fleet is administered from a central place. DS

Autonomous ship projects and robotics to watch out for in 2020

Advanced robotic technology and autonomous processes have the potential to significantly improve safety at sea, cut costs, and deliver greater environmental efficiencies. Several maritime projects that are underway indicate the industry's progress in deploying advanced technology to automate operations.

The shipping industry is seeing a rise in investment injected into the research and development of advanced robotics and remotely operated vehicles. Machine learning, big data, advanced software and sensors, virtual reality (VR), artificial intelligence (AI) and broadband at sea are being increasingly deployed in maritime operations to improve safety, efficiency, and environmental sustainability. Here are some projects that demonstrate the maritime industry's transition into more autonomous and remotely operated operations.

The AUTOSHIP project

In January this year, a Norwegian project announced it had received 20 million euros from the EU's Horizon 2020 research programme to commence its four-year AUTOSHIP project. The project aims to help reduce emissions and increase the competitiveness of maritime transport by reducing costs, reducing staff for example, and increasing flexibility by allowing smaller vessels to enter smaller ports and terminals more often. This will be demonstrated in two autonomous transport systems, one for cargo on Belgian channels and one for shipping of fishing liners along the Norwegian coast.

Kongsberg Group and SINTEF are the two main partners in the project. According to senior researcher from SINTEF Ocean Ørnulf Jan Rødseth, the project will help SINTEF to further develop methods for cost-effective and safe designs for future autonomous transport systems.

During a visit to the SINTEF facility in Trondheim, Norway, Trond Andreas Vikan Johnsen, research manager at SINTEF explained to Digital Ship the company's focus. "We're not thinking so much about how to build a ship now but more about how to cope with things around. For example, we're looking at autonomous remote control, how navigation and steering systems will work, and how the vessel will communicate with other vessels and its surrounding."

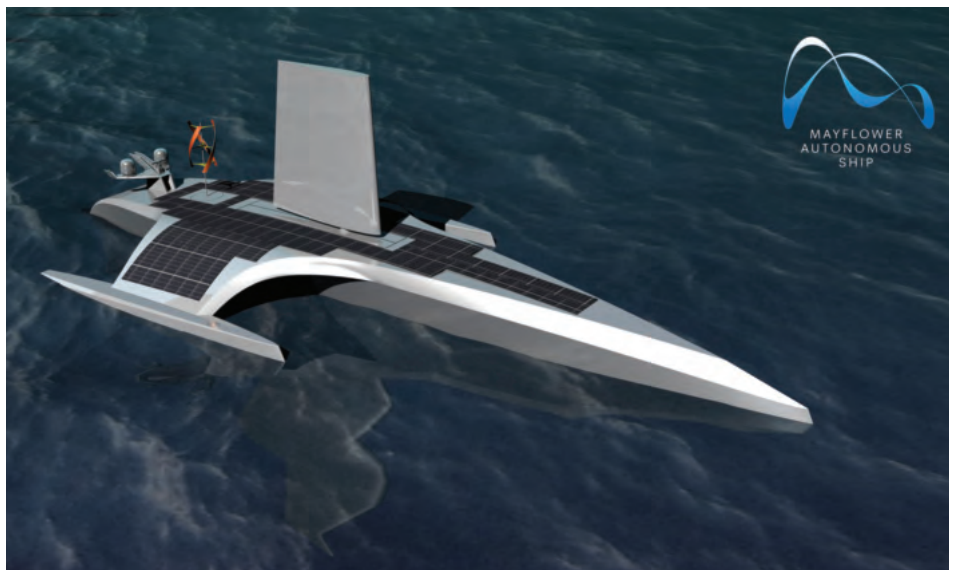
The Mayflower Autonomous Ship (MAS) project

In September 2020, one of the world's first fully autonomous ships is expected to cross the Atlantic with no human captain or onboard crew. The mission, which is anticipated to take 12 days, aims to further understand the capabilities and potentials that lie within technology for autonomous shipping and gather critical data about the ocean.

For the last two years, marine research organisation Promare and technology partner IBM have been designing and building the autonomous systems, including an artificial intelligence (AI) captain, to assist the vessel in making the voyage from Plymouth in the UK to Plymouth, Massachusetts without any crew or humans onboard. Using IBM's computer vision technology, the Mayflower's AI Captain should be able to independently detect and classify ships, buoys and other hazards such as land, breakwaters and debris.

Not only will the voyage mark one of the first completely autonomous voyages across the Atlantic, but it will also commemorate the 400th anniversary of the original Mayflower ship's voyage in 1620, which transported 102 British settlers from England to America, the first pilgrims to land there.

The vessel will have a maximum speed of 10 knots and be powered by wind and solar with a diesel generator for back-up. IBM Cloud and edge systems will provide additional security and as the Mayflower will not have access to high-bandwidth connectivity, it will use a fully autonomous IBM edge computing system powered by several onboard NVIDIA Jetson AGX Xavier devices.



The mission aims to further understand the capabilities and potentials that lie within technology for autonomous shipping. Image courtesy of the MAS project.

AUTOSHIP aims to speed-up the transition towards a next generation of autonomous ships in the EU. Image courtesy of AUTOSHIP.

At the beginning of March 2020, sea trials began on a manned research vessel off the coast of Plymouth, UK, to evaluate how the AI Captain uses cameras, AI and edge computing systems to safely navigate around ships, buoys and other ocean hazards that it is expected to meet during its transatlantic voyage in September 2020.

"While the autonomous shipping market is set to grow from $90BN today to over $130BN by 2030*, many of today's autonomous ships are really just automated - robots which do not dynamically adapt to new situations and rely heavily on operator override," said Don Scott, CTO of the Mayflower Autonomous Ship. "Using an integrated set of IBM's AI, cloud, and edge technologies, we are aiming to give the Mayflower the ability to operate independently in some of the most challenging circumstances on the planet."

On March 24, 2020, the hull of the ship which was designed in Gdansk, Poland set off for Plymouth in the UK.

The Yara Birkeland unmanned vessel

"The most googled Norwegian project," according to Trond Andreas Vikan Johnsen, research manager at SINTEF is the Yara Birkeland.

In just a few months' time, fully-electric and zero-emission container vessel Yara Birkeland is expected to take its maiden voyage from Norway. The vessel, which is a result of a partnership between Yara and Kongsberg, was first announced in May 2017 with the initial aim of eliminating about 40,000 diesel-powered truck trips made each year.

The vessel will be 80 meters long with a 15-metre beam and will have no ballast system. It will feature Azimuth pods for propulsion and batteries to cut emissions completely.

Sea trials are due to take place later this year (2020). When the ship first enters operation, it will be operated manually and transition to completely autonomous within the first two years of its operation.

The Bastø Fosen VI adaptive ferry transit

In February 2020, Kongsberg Maritime announced that the world's first adaptive ferry transit took place across a Norwegian fjord. The Bastø Fosen VI, loaded with passengers and vehicles, demonstrated fully automatic control from dock to dock. The transit marked a key step forward in the integration of autonomous technology into everyday shipping operations.

The Yara Birkeland. Image courtesy of Kongsberg.

Bastø Fosen VI featured a fully-integrated digital system, which automatically performs all dry-docking and crossing functions, with the highest accuracy.

The successful transit was a result of collaboration between shipping company Bastø Fosen, KONGSBERG and the Norwegian Maritime Authority (NMA).

The next step for Bastø Fosen VI is to use adaptive transit functions developed from Kongsberg Maritime's advanced systems to enhance the daily operation of its Horten-Moss service.

An anti-collision system, comprising radar and electro-optical sensors, is expected to be fitted to Bastø Fosen VI this summer and be under test by autumn, but crew will remain on the bridge even as the level of autonomy increases.

The semi-autonomous hull cleaning robot

In March 2020, Jotun and several industry players including Kongsberg launched a semi-autonomous robotic technology called HullSkater to help owners and operators protect their ships from biofouling damage.

HullSkater cleans the hull of a ship with specially designed motorised brushes that prevent surface and paint damage. The technology removes individual bacteria and biofilm before macro-fouling takes hold.

A visual representation of the autonomous drone in development as part of the ADRASSO project. Image courtesy of DNV GL.

The new solution features magnetic wheels, the force of which allows the technology to stay attached to the vessel at all times, enabling it to be deployed for hull cleaning at any time. HullSkater Each wheel is equipped with electric motors for propulsion and steering and the vehicle is fitted with four digital cameras and sensors to generate high quality film and images that are immediately available to the user.

The vehicle is connected to the operator's control centre through an umbilical and can be operated remotely for vessels anywhere in the world with 4G coverage. Inspection and cleaning of the hull will normally take around 2 to 8 hours, depending on size and condition.

Shipping company Wallenius Wilhelmsen agreed to install HullSkater on one of its vessels where it has been operating for the last two years. Geir Fagerheim, SVP marine operations at Wallenius said: "We see it as a potential game-changer with the way we manage biofouling today. It is a self-sufficient solution so there is no need for interference or action from the office to make this happen. It has helped us to stop overconsumption of fuel and keep emissions down."

The technology was launched in mid-March 2020 and is at the beginning of its journey. According to Jotun's president and CEO Morten Fon, this project demonstrates the success of collaboration and that's where he sees future efforts focussing. "We see lots of collaboration across industries and I believe that's the name of the game for the future. Each company doesn't have the competencies and knowledge within all areas so we need to find other companies that we can collaborate with to develop these solutions further."

Read more on Jotun's HullSkater on page 28 of this magazine.

The ADRASSO project

Drones are being increasingly deployed to carry out remote inspections and surveys, improving safety and efficiency. A project by classification society DNV GL, known as ADRASSO – Autonomous Drone-based Surveys of Ships in Operation, is looking into how ship inspections via drones can be taken one step further with the use of autonomous drones.

According to Øyvind Smogeli, DNV GL's program director digital assurance, group technology and research, the research project is examining how autonomous drones with hyper-spectral cameras can be used to obtain more accurate information on the quality of ship tanks. The vision encompasses a drone that, "Will be able to detect cracks using computer vision, to deliver ultrasound thickness measurements using hyper-spectral imaging, with an AI or VR interface to help the surveyor easily see where the drone has been."

The drone will work by flying itself into a ship's cargo or ballast tank and use AI to detect rust, cracks or poor coating conditions. It will also measure steel thickness and compare this with historical data to determine the development of rust and cracks. According to DNV GL, this could improve safety by reducing the number of human inspectors entering tanks, lower the cost of inspections by eliminating the need for scaffolding, improve efficiency due to less time needed for inspections, and ensure faster reporting and decision-making. DS

**www.alliedmarketresearch.com/autonomous-ships-market*

Bureau Veritas performs first survey by drone

www.bureauveritas.co.uk

Bureau Veritas Marine & Offshore (BV) has completed its first survey by drone. The survey was carried out in the holds of a bulk carrier in an Italian port.

The scope was an intermediate survey on a bulk carrier and consisted of close-up inspections and ultrasonic thickness measurements (UTM) conducted by the drone in two cargo hold spaces. The required prior agreement from the flag authority was confirmed.

BV has conducted tests and established 'proof of concept' for the most advanced inspection techniques to confirm that the technologies are providing safer and even better quality evidence to conduct and support the survey process while also offering benefits and advantages for ship-owners and ship-managers.

Compared to traditional survey practice immediate benefits include the obvious reduction in time and cost in needing staging, raft surveys or rope access specialists in combination with the required thickness measurement capabilities.

Bureau Veritas has confirmed that aerial drones are now mature, they are survey ready on an operational basis and provide:

- Safer conditions for the surveyor and the operator who are not exposed to the risks of working at height nor, necessarily, will they be required to enter into the confined spaces for the inspection.
- Time saving during the inspection.
- The potential for better quality evidence when assessing the condition of the hull.
- Optimised maintenance costs and planning by reducing ship's immobilisation and optimising the preparation before the repairs.

Laurent Leblanc, senior vice-president, technical & operations said: " We are now ready to offer operational surveys using drones anywhere in the world. We will continue to look for innovation and test new ideas but drone surveys are now going to be part of everyday life for ship surveys. Above all drones provide a level of detail and new level of safety that will benefit both our clients and our surveyors.

"Drone surveys and our remote survey capability and service delivery are really just starting to make an impact on our clients. They are a vital development for the future of classification. Now we can both see and decide remotely."

Drone operator with Bureau Veritas surveyor and drone in flight. Image Courtesy of Bureau Veritas.

Skating robot helps ship operators optimise hull performance

The transfer of aquatic organisms and micro-organisms from their native habits to non-native ones via ships' hulls is a problem costing the industry up to USD 30 billion each year*. A new ship-scrubbing semi-autonomous robot is helping owners and operators to deal with this issue to cut unnecessary fuel consumption and prevent ecological disruption.

Known as biofouling, the issue is one caused by organisms such as plants, animals and micro-organisms latching onto submerged structures and surfaces, including ships' hulls and being transported many miles across the ocean. Wherever they decide to leave the ship, the area may be, ecologically speaking, completely different to their native environments, which disrupts the natural balance of the ecosystem they have just inhabited. DNV GL's principal consultant Sarath Raj says he sees, "Increased attention from port authorities who are threatened by risk of invasive aquatic species. Ships can be stopped outside ports and told they have a dirty hull and they need to clean the hull before they can enter. That can be an extremely expensive process."

What's more is that biofouling creates an additional layer of resistance across the ship's surface, increasing a vessel's fuel consumption and exacerbating greenhouse gas (GHG) emissions. The problems of biofouling today include a 20-30 per cent inefficiency in fuel consumption in shipping, according to Geir Fagerheim, SVP marine operations, Wallenius Wilhelmsen.

Shipowners and operators are under increasing pressure to ensure smooth and resistance-free ship hulls to mitigate the issues of biofouling, but often this is done either in dry-dock, which increases ship downtime, or during port visits.

A robot to rethink hull performance

For the last four years, Norwegian coatings and paint manufacturer Jotun has been quietly working in collaboration with other maritime players to develop a new innovative solution that will address the issues described above.

The solution, which was announced in mid-March during a launch event in Oslo, is called Jotun HullSkating Solutions (HSS) and covers a range of services including:

- Inspection and cleaning via Jotun's semi-autonomous robot, HullSkater.
- Technical services.
- Proactive condition monitoring.
- Performance and service level guarantees.

According to Jotun, HSS will deliver individual proactive condition monitoring services tailored for each vessel, using a proprietary algorithm and big data to accurately predict fouling development and cleaning schedules.

One of the key offerings as part of Jotun's HullSkating Solutions package is the semi-autonomous robotic technology that sits permanently onboard a vessel, ready to be deployed for hull cleaning at any given time. This technology is known as HullSkater and was developed in collaboration with Kongsberg.

HullSkater is a piece of technology that operates underwater, in all sorts of harsh and challenging environments, cleaning the surface of the vessel with specially designed motorised brushes that prevent hull surface and paint damage. The HullSkater removes individual bacteria and biofilm before macro-fouling takes hold.

HullSkater features magnetic wheels, the force of which allows the technology to stay attached to the vessel. Each wheel is equipped with electric motors for propulsion and steering and the vehicle is fitted with four digital cameras and sensors to generate high quality film and images that are immediately available to the user. The vehicle also has a self-powered built in drive line to ensure high speed manoeuvring.

The vehicle is connected to the operator's control centre through an umbilical and can be operated remotely for vessels anywhere in the world with 4G coverage. Inspection and cleaning of the hull will normally take around 2 to 8 hours, depending on size and condition.

As the technology remains onboard the vessel, shipowners and operators can benefit from unlimited idle days, reducing time allocated to hull cleaning which in turn saves costs, improves the ship's environmental footprint, and increases operational flexibility.

Arne Rinnan, EVP sensors and robotics, Kongsberg says that one of the driving forces behind the innovation was to simplify some of shipping's complex operations. "We wanted to make complexities simple. It's just another way of looking at integration," he explains. "It needs to be reliable and simple for day to day operation.

"We have a series of sensors, which is crucial to get it (HullSkater) to operate in a reliable way. We also are using battery technology and connectivity solutions in the HullSkater, combining the sensors with technology like machine learning."

Collaboration is the name of the game

To develop the semi-autonomous solution, Jotun consulted a range of companies to join as partners. Geir Axel Oftedahl, business development director at Jotun explains how the paint company collaborated to develop a technology outside their typical range of products.

"Back in 2011 we had some ideas and were opening our minds for future innovations, but we didn't know about robotics. So, we approached subsea robotics leader Kongsberg, and asked for their advice and if we were crazy to move in this direction." Fortunately for Jotun, the companies agreed that it was an interesting initiative to pursue.

Jotun's president and CEO, Morten Fon is grateful to Kongsberg's president and CEO Geir Haoy for bringing, "knowledge and competence to the table that we do not have."

Another partner is Wallenius Wilhelmsen, which has been operating with HullSkater for two years. Geir Fagerheim, SVP marine operations at Wallenius admits that initially they were, "slightly sceptical about a paint company coming to us with an advanced technical solution. Could they really make this work in the harshest environments across the world and be remotely operated?"

However, Fagerheim confirms that it has been a success so far for the shipping company. "We see it as a potential game-changer with the way we manage biofouling today. It is a self-sufficient solution so there is no need for interference or action from the office to make this happen. It has helped us to stop overconsumption of fuel and keep emissions down."

Hans peter Havdal, general manager Norway, Semcon, another one of the partners in the project believes that biofouling is a hardship that has become more and more important. He is a strong believer of partnerships and collaboration to combat such issues and cites it as one of the reasons Semcon decided to join the project. "We need to work together. We need to bring in different companies together and work as a team with different expertise is new way of working to be faster and cost efficient."

Classification society DNV GL was also involved in the project. Per Marius Berrefjord, SVP strategy and business development at DNV GL says they saw it as an interesting technology to help combat multiple issues shipping is faced with today. "If you look at the bigger picture, shipping needs to reduce GHG emissions and it needs to do it very fast, maybe 2-3x faster than has been the normal way of going.

"We are serious at DNV GL to support activities that can contribute to that. To make it happen we need to work on logistics, the technical management of ships, the technologies to save fuel, especially with the introduction of new fuel types. If you put HullSkater into this picture you can see it is combining new technologies and solutions, can contribute to saving fuel, and is available for newbuilds and retrofits so it can be integrated fast and make an immediate impact."

For Jotun's Morten Fon, this project demonstrates the success of collaboration. "We see lots of collaboration across industries and I believe that's the name of the game for the future. Each company doesn't have the competencies and knowledge within all areas so we need to find other companies that we can collaborate with to develop these solutions further."

Arne Rinnan, EVP sensors and robotics at Kongsberg says that this project has the capabilities and capacities to scale to market introduction and support services. "The focus now is to bring this to market with Jotun and make it a success." DS

The Jotun HullSkater has been developed in partnership with Kongsberg Maritime.

HullSkater features a self-powered built in drive line for high speed manoeuvring. Image courtesy of Jotun.

**According to the Clean Shipping Coalition.*

Rethinking maritime businesses for the digital age: the evolving role of ship agents

Enhanced digitisation and collaboration are changing the role of the ship agent, delivering greater opportunity for the agent to lower costs for a shipping company or charter. Mikael Lind and Juan Carlos Croston explain more.

Traditionally, a ship agent (as a representative of the owner, the charterer -or both- of a visiting ship), ensures that the essential requirements for a ship visit are arranged and met. Therefore, they have an important monitoring role, before and during a port call, taking the necessary actions to avoid or minimise disruptions. Ship agents also guarantee that involved port actors are paid at the right level of compensation.

Enhanced digitisation and collaboration in the maritime transportation sector, through implementation of digital data sharing, is an inevitable and unavoidable change and one that will affect the ship agent's business.

The current article explores emerging opportunities, and prerequisites to harness these.

The traditional role of ship agents as the ship's port call coordinator

The shipping industry is a self-organising ecosystem where all its members are capital creation systems. They each develop their specific recipe for creating capital by converting capital from one form to another form of capital. For example, a shipping company uses economic capital to hire human capital to staff ships.[i] The combination of individual members' capital and their related systems for transforming capital from one form to another is the shipping ecosystem.

Ship agents provide two major types of capital. First, they provide social capital in the form of a network of connections with a port's service providers because they typically have personnel physically located in a port's city. Their specialised local social capital means they know whom to contact for routine and special services.

Second, they have developed routines and procedures, organisational capital, to deal with the local laws and regulations and atypical features of their port and its environment. They have created efficient procedures to weave together the various local requirements and services needed for a successful port visit in their territory.

Digital challenges for the ship agent

Traditionally, the port and its operators have relied primarily on the information provided by ship agents to understand the current and future status of a port call. However, increased implementation of digital data sharing among port actors is changing that.

Enhanced digital collaboration, by direct digital data sharing, creates a dynamic, up-to-date, common situational awareness as the basis for the alignment of activities in the port call process. An increased focus on port call optimisation offers significant opportunities for efficiency improvements and environmental gains for service providers and consumers. But this requires rethinking many port call activities and roles.

In this context, digital data sharing and collaboration could challenge the power of the ship agent as the primary information hub for all involved in a port call and may be interpreted as a force reducing the value proposition in the ship agent's business concept. For instance, agents' social capital will decline in value if they do not accommodate digital data sharing for establishing the phasing of a port visit and managing its execution. For example, communicating by individual phone calls or emails could be a time consuming, costly and inefficient alternative to a seamless digital data exchange with service providers to establish when, where, and what services will be provided and to update these as circumstances require.

Shipping agents who want to continue to participate profitably in the ecosystem will need to re-blend their social and organisational capital to match the digital connectivity and standardised digital data exchange that will dominate the execution of the future port visit.

Revisiting the foundations

The future role of ship agents is now coming under the spotlight. That role will be influenced by digital systems of record and data sharing that provides dynamic high-fidelity situational awareness for all stakeholders. Digital data sharing and greater visibility of plans and their modification could enhance the role of agents willing to embrace digitisation.[ii]

With the growing ability of the ship agents to collect and analyse incoming data streams, their value proposition for both the ships as well as the port actors opens new opportunities to change and enhance their business model. They could go beyond organising the delivery of local services to ensure that they are delivered with full satisfaction and predictably as well as validating invoices against real time data. This means that a ship agent could become the provider of information and imitation services to transport buyers and cargo owners by becoming the physical and informational integrator of maritime operations in the global transport chain.

Ship agents could go beyond organising the delivery of local services to ensure that they are delivered with full satisfaction and predictably as well as validating invoices against real time data.

An agent's organisational capital needs to be reformulated as software that can seamlessly connect with all parties within the port because the ecosystem is being rewired with fibre optics, WIFI, 5G, and satellites. To facilitate interoperability between information systems, the agent must also use an established data exchange standard, as well as building data analysis capabilities.

A digitally connected and coordinated agent can contribute to lower costs for the shipping company or charter. For example, if the ship agent has greater certainty over ship arrival times because of digitisation and data sharing, then crew replacements as well as inspections could be supported without the need for extended overnight accommodation in hotels.

Traditional social capital maintained through informal means, such as a dinner or coffee together, will still have its place. It will remain a source of innovation and reinvention as it will keep the shipping agent aware of what its port partners are planning in terms of new services and facilities. Every formula for success, even in past traditional times, requires an ongoing recipe rejuvenation because of changes in practice and technology. Routine interactions will be digital, but the future will be socially constructed by shipping agents and service providers and then digitally engineered.

Collaboration (and sustainability) are key drivers for the future of shipping and supply chain industries. The enhanced degree of digitisation and collaboration now occurring in the maritime transportation sector offers greater efficiency, predictability and profitability for the involved actors.

Although it will change the capital creation recipe of many actors in the maritime transport ecosystem, this development should be welcomed by ship agents. By embracing the digital port scenario, ship agents can continue to be the primary source of local information in port call visit coordination and can create new business opportunities. The implementation of data sharing for enhanced transparency and harmonisation among port actors creates opportunities for ship agents to deliver faster and higher service quality empowered by digital means and new services, including some of those mentioned in this article. DS

References:

[i] Watson, R. T. (2019). Capital, Systems and Objects: The Foundation and Future of Organizations. Athens, GA: eGreen Press.

[ii] The UNCTAD guidelines for shipping agents, published in 1988, would accordingly need updating, to reflect these developments - https://unctad.org/en/PublicationsLibrary/unctadstship13_en.pdf

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Matching transparency with the digital age

The shipping industry is becoming increasingly connected and with that comes a need to bring in those from outside the maritime domain to learn from, to enhance transparency, and to ultimately reap the rewards of a digitalised and increasingly automated industry.

There is increasing evidence to suggest that future ships and shipping operations will heavily rely on autonomous systems, with millions of algorithms and coding systems working to intelligently control and navigate ships. However, as a vessel is unlikely to become 100 per cent autonomous as humans will always be involved in the interaction and decision-making processes, it is essential that automated systems are designed to work together with humans in a transparent manner, Mikkel Hansen, CEO of the Denmark-based Maritime Development Centre (MDC) told delegates attending a Digital Ship forum in February this year.

Hansen believes that in order to actively embrace technology, gain the benefits from its introduction, and to feel that humans can contribute where they can and outperform computers where possible, the integration and transparency of automated systems is critical.

According to Hansen, there are three key elements that should be considered when thinking about how to transform the industry and get the most out of advanced automated technologies:

- Learn from other industries. Hansen believes that rather than reinventing the wheel, the shipping industry must take note from others.
- Integrating the supply chain and look for the customer.
- Enlighten yourselves and ensure transparency.

While Hansen himself comes from a maritime background, he believes that, "We need to look for innovation from outside the maritime domain.

"In the shipping industry we might be experts in building and operating ships, but that doesn't mean that we have the answers to future questions we face. Technology is getting complicated and connected and we cannot rely on educating our own expertise for the future operational challenges.

"Other people are entering our industry and moving it ahead. We have to have non-maritime companies to develop solutions for shipping."

Hansen believes that it is every person's responsibility to learn from others with different backgrounds, and that the maritime expertise is merely to integrate different professional fields into the shipping or maritime domain.

"We need to consider ships as systemic, part of something bigger, otherwise I doubt that we will succeed.

A project by MDC called the Connected Ship, which is funded by Nordic Innovation, takes technologies, processes and solutions from the smart city sector and integrates them into the maritime community. Smart city systems are designed to connect and analyse data from a variety of sources, sometimes challenging and harsh environments. Internet of Things (IOT) centres collect atmospheric data, movement of objects and manage what is going on in a complex environment.

The goal of the project is to demonstrate a digitalisation platform onboard a ship by utilising technology, platforms and experiences from smart city projects combined with maritime industry control systems, communication protocols and environmental prerequisites. This will help prepare the ships for future interaction with the smart society, including harbours, trucks, cargo, passengers and other smart micro-systems.

Hansen's future vision of shipping consists of, "A more diverse fleet, with very advanced systems and vessels, but they will be side by side with the 1970s built bulk carrier design," he told the conference audience. "That's why these systems must be integrated, everything has to be automatic. There will be a wide variety of systems and solutions and a digital shipping industry has to realise we don't have isolated cases, that everything is autonomous or digital.

"We sometimes look at different components or processes onboard and wonder how we can optimise to make it more efficient, however, we don't always consider that this component is part of a sub-system. We have to think about how components integrate and deal with other components in order for the sub-system, the ship, to work optimally and flawlessly."

When it comes to voyage optimisation, it is possible to improve energy consumption in one area by making a small modification to a system or process, or by changing an operational element. However, Hansen warned that considering only that process or element in isolation and neglecting to consider the impact on the whole ship or fleet, energy consumption could be exacerbated elsewhere. "If one sub-system is optimised with regards to energy consumption, what happens if that's at the cost of the ship performance as a whole?" To acquire a true understanding of the performance of a ship or fleet and how that can be improved, Hansen is a firm believer of thinking of a ship as a sub-system and carefully examining how well its components and processes have been integrated. DS

Mikkel Hansen, CEO of the Denmark-based Maritime Development Centre (MDC) believes that it is essential for automated systems to be designed to work together with humans in a transparent manner.

Theyr joins SPRINT in AI-driven voyage optimisation project

www.theyr.com

Met-ocean data provider for the marine sector Theyr has signed up to the national SPRINT business support programme. Theyr will collaborate with SPRINT partner, the University of Southampton on the development of a marine vessel routing application that will enable a cleaner future for commercial shipping.

The SPRINT project will focus on the real-time exploitation of space data used in the development of voyage optimisation solutions for commercial vessels.

The project combines the very latest in high fidelity Met-Ocean forecast data with leading edge genetic algorithms to create a route optimisation module that will produce the most efficient routes for vessels and reduce greenhouse gas (GHG) emissions.

The University of Southampton will provide Theyr with expertise in best-in-class genetic algorithms and optimisation to exploit increasingly higher fidelity satellite data. Theyr will also use the University of Southampton's IRIDIS5 supercomputer, the UK's largest academic supercomputer to speed up the verification process.

The latest International Marine Organization (IMO) regulations compel the shipping industry to significantly reduce its GHG emissions from the start of 2020, which in turn, has led to a major increase in the cost of compliant fuels. These latest regulatory requirements continue to fuel the digital revolution within the industry, facilitating the transition to a greener future.

David Young, CEO of Theyr said: "We're delighted that this SPRINT project has been given the green light. Combining our expertise with the substantial knowledge and resources of the University of Southampton will facilitate the future sustainability of commercial shipping by effectively reducing fuel costs and greenhouse gas emissions within the industry through the use of AI and high-fidelity MetOcean data."

Dr Adam Sobey, associate professor in the Maritime Engineering Group at the University of Southampton and co-lead of the marine and maritime group in the data-centric engineering programme at The Alan Turing Institute, added: "This project exploits the very latest in AI through a genetic algorithm developed by my team at the University of Southampton and which shows leading performance on a range of optimisation problems.

"We are developing a set of algorithms which will increase the fidelity of data that we can use and the range over which we will optimise. This will future proof the software against these increases in fidelity and provide leading performance over competitor software."

Theyr will collaborate with SPRINT partner, the University of Southampton on the development of a marine vessel routing application.

The project will be funded by a grant from the £4.8 million SPRINT (SPace Research and Innovation Network for Technology) programme that provides unprecedented access to university space expertise and facilities. SPRINT helps businesses through the commercial exploitation of space data and technologies.

Monohakobi Technology Institute discusses One Sea and autonomous shipping

Monohakobi Technology Institute (MTI), the R&D subsidiary of Japan's NYK Group, offers insight into its participation One Sea, the global shipping and digital technology leadership group that seeks to develop an autonomous maritime ecosystem by 2025.

One Sea, the pan-industry global alliance focusing on autonomous ships, continues to attract leading names from the global digital, communications and ship technology arenas. One of its newest members is MTI (Monohakobi Technology Institute), which is "adding more momentum to our ecosystem development and bringing with it the benefits of many years of acclaimed international maritime R&D," according to One Sea chairman, Capt Eero Lehtovaara.

MTI, which joined the One Sea Alliance in 2019, was established in 2004 and has a successful track record in international collaborative projects focused on ship efficiency, automation, decarbonisation and data management. Dr Hideyuki Ando, senior general manager at MTI, described its favoured approach as 'manned autonomous'.

"Our project has been led by ship captains, but they are looking at autonomy as a support," he said. "We believe that 'manned autonomous', based on highly automated systems supporting human operations, will be the best option in terms of safety.

Manned automated

"We recognise the positives and the negatives connected to the human element," said Dr Ando. "Human beings suffer from fatigue, can become distracted by other tasks and sometimes lack full situation awareness. But they are flexible and can give deep thought, weighing up options. Humans and machines have different characteristics and our captains are considering the combination of the two. We believe that we can reduce incidents, such as collisions, by introducing such man-machine collaboration and this would be economically attractive compared with traditional ship operations."

In a 2019 presentation at BIMCO's Autonomous Ships Seminar in Copenhagen, Dr Ando and the head of NYK captains, Capt. Tomoyuki Koyama, NYK Line's managing corporate officer, revealed the results of financial analysis of ship automation options. They indicated that, per year, a 'manned autonomous' operation would be about 20 per cent less costly than the conventional non-automated ship in operation today; an 'unmanned autonomous' operation, on the other hand, would double annual costs, whilst a ship involving 'remote operation' would be more than four times as expensive.

"Today's technology is not yet sufficiently mature to achieve full autonomy," Dr Ando said. "For example, about 70 per cent of the ship collisions that we have analysed have been caused by a lack of situational awareness on the part of human beings. However, we think that could also happen if a computer were not able to identify every potential hazard from the radar, video or lidar sensors. If the weather conditions are very bad, for example, with very high waves, the sensors and image processing may not be perfect and therefore we may not be able to rely on completely accurate situational awareness."

Data collection standards

NYK and MTI have developed their own data collection standards internally and all NYK ships today use a Ship Information Management System (SIMS) which provides data to the cloud, supported by operations personnel and technical analysts ashore. Dr Ando acknowledged that many other shipping companies have been making similar moves, but he believes there should be a collaborative approach.

"We are a shipping company – that is our core business. How to collect data safely and effectively is not a place to compete. NYK Group is aiming to define a manned-autonomous system framework called Action Planning and Execution System (APExS) and to clarify its requirements through open dialogue. It's definitely an area to cooperate and it is now logical to move to the next step as a member of the One Sea organisation.

"We must have a common understanding of requirements for each component, interfacing equipment, acceptable protocols and which data should be transferred. We have already talked about this at the One Sea meetings that we have attended so far, but we are looking forward to discussing these issues in more detail at forthcoming workshops."

Dr Ando cites another project, funded entirely by the Japanese Government, in which the risks and hazards relating to autonomous vessel operation are identified. The three-year project, involving a tug belonging to NYK subsidiary, Wing Maritime Service Corporation, has most recently involved remote operations in Tokyo Bay.

Dr Ando explains that technology is not the main point of this trial. The objective is to establish the requirements that need to be met in an autonomous ship system, bearing in mind upcoming discussions at the IMO on autonomous ship related regulations. Comprehensive appraisals were undertaken, including hazard identification, failure mode and effects analysis (FMEA), factory acceptance tests and harbour acceptance tests. All of the results are being shared with the Japanese Government so that it can play an active part in future IMO discussions.

Global collaboration

MTI has a consistent track record of cooperating on research projects with international companies. It has worked on several ship performance projects and safety operation projects with Maritime Research Institute Netherlands (MARIN) and was an early adopter of vessel data exchange, using DNV GL's Veracity open platform in an agreement including MAN Diesel & Turbo, as it was then called.

Dr Hideyuki Ando, senior general manager at MTI.

A current long-term research project with Tromsø-based Dualog, a communications company, and supported by Innovation Norway, involves the development of digital systems and services on board 50 NYK vessels, prior to a fleet-wide roll-out in the future. The project, known as Cepa Shield, aims to ensure data transfer efficiency and cyber protection in ship-shore communications, both in-house and with third party managers and OEMs. This project is expected to run until the end of next year.

In the NYK Super Eco Ship 2050 project, MTI worked with Finland's Elomatic to develop a concept design for an emissions-free pure car carrier. Following earlier work on a futuristic container ship design by the same parties in 2009, the energy demand for the car carrier is approximately 70% less than current designs and CO2 emissions have been completely eliminated.

Dr Ando stressed the importance of a collaborative approach to data collection and sharing. In this respect, One Sea's global agenda and its focus on standardisation relating to automated ships is likely to benefit from MTI's considerable experience in the development of data collection standards and protocols, now embodied in ISO standards 19847 and 19848. **DS**

"Human beings suffer from fatigue, can become distracted by other tasks and sometimes lack full situation awareness."

Bureau Veritas opens first remote survey centre in Rotterdam

www.bureauveritas.co.uk

Bureau Veritas Marine & Offshore (BV) has opened its first remote survey centre, located in the major maritime hub and port city of Rotterdam.

The centre is focussed on supporting remote service delivery capability and is part of BV's North European Zone head office and BV's Zone Marine Operations Centre.

"This is a new and important milestone in the Bureau Veritas global strategy of Digital Classification using digital technologies to transform the operating model of classification for the benefits of its clients," sid Laurent Leblanc, senior vice-president, technical & operations.

Bureau Veritas has conducted a full program of tests and proof of concepts confirming that the relevant technologies are now mature enough to enable remote surveys. Technologies used include optimised live-streaming solutions; connected devices (smart phones, tablets, Go-Pro cameras, smart glasses, augmented reality); and connectivity on board – with improvements from 4G networks and 5G yet to be realised.

Finland aims at the leading edge of automation and digitalisation in maritime transport

Finland aims at being one of the world leaders in developing the digitalisation and automation of maritime transport. In this article, Valtteri Laine, special adviser at Traficom, the Finnish Transport and Communications Agency explains how Finland is influencing the development of maritime digitalisation and automation to help lower operating costs, cut GHG emissions, and improve safety.

Maritime industry and well-functioning merchant shipping connections are important to Finland since about 90 per cent of our exports and 80 per cent of imports are carried by sea. Therefore, smoothly flowing, reliable, safe, environmentally sound and affordable sea connections are essential for our foreign trade. Maritime transport and related maritime industry – on a larger scale, the whole Finnish maritime cluster – also play a central role in enabling Finnish welfare and competitiveness.

A port is a transport chain hub connecting land and maritime transport. Almost all export and import transports in Finland are carried via ports, and at the same time, the transit traffic increases the flow of goods through ports. The Finnish port network is comprehensive, covering coastal areas and the inland waterways of Lake Saimaa. Measured by amount of goods, our largest ports are ports of Sköldvik, Helsinki and HaminaKotka. Some of the Finnish ports are so-called winter ports, kept open by means of icebreakers.

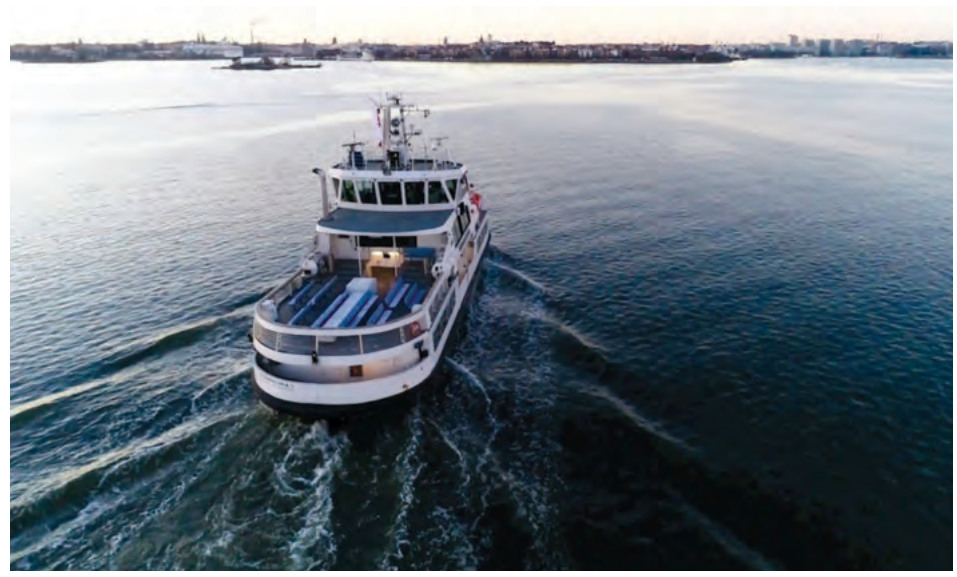
Because about 70 per cent of all freight transport to and from Finland is carried via ports of the Baltic and North Sea, we have to ensure that maritime traffic in our seas is safe, efficient and sustainable. Ships sailing under the Finnish flag as well as all other vessels must be handled by competent staff and be even more energy-efficient than before. We cannot ensure these objectives alone but in collaboration with our Baltic neighbours and in international forums, such as the EU and International Maritime Organization (IMO). At the same time, Finland may get an opportunity to provide solutions for the sustainable future of global maritime transport.

Experiments and testing in Finland

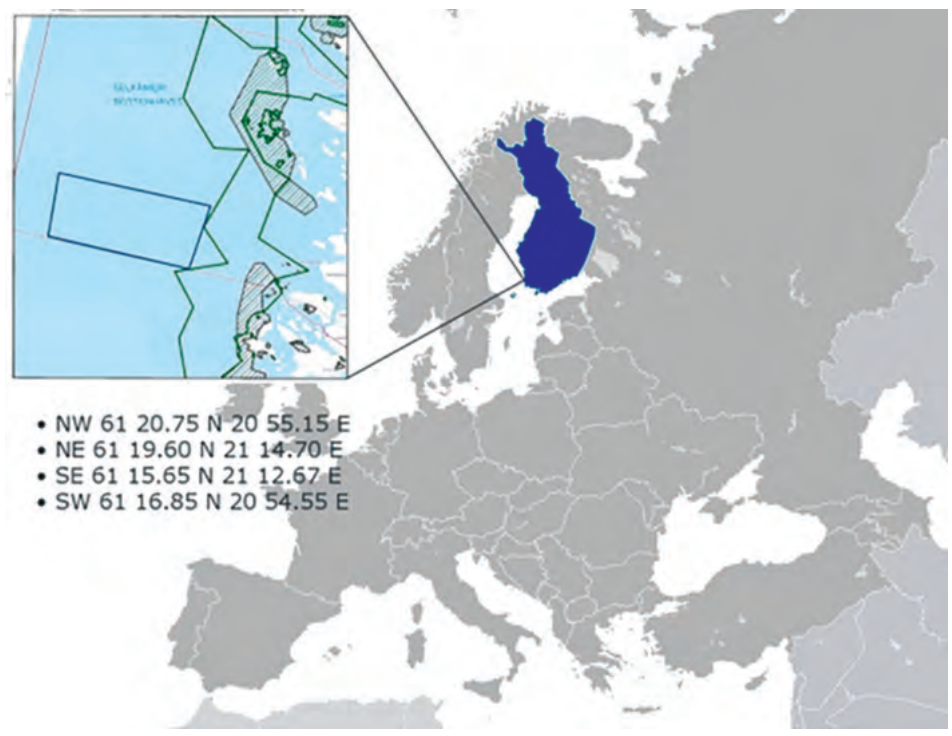
Finland aims at being one of the world leaders in developing the digitalisation and automation of maritime transport. New technological solutions in maritime transport provide practical examples of utilising digitalisation and automation, including the optimisation of vessel routes and engine power, use of augmented reality on navigating bridges, remote control of ship operations, and autonomous vessels.

Several leading companies creating new technological solutions for the needs of maritime transport together with universities and research institutions are based in Finland. In Finland, full-scale experiments on the use of autonomous and remote-controlled vessels have been carried out successfully, gaining well-deserved attention also internationally. In 2018, the shipowner Finferries demonstrated the world's first fully autonomous ferry in the Finnish archipelago, whereas ABB and Helsinki City Transport successfully completed the world's first remote trial for an existing passenger ferry.

In addition, Finland also boasts an internationally unique, open-to-all maritime test area Jaakonmeri, located in the coastal area of Finland. The test area enables maritime technology experiments, such as trials with remote-controlled and autonomous vessels. The goal is to establish a similar test area further in the Baltic Sea which would allow for the Baltic countries to experiment in cooperation at the transport system level as well.



Testing of the remote Suomenlinna II ferry in front of the Port of Helsinki. Image courtesy of ABB.



Autonomous vessel test area on the west coast of Finland.

International impact

Finland aims at influencing the development of maritime digitalisation and automation in both the IMO and in the EU together with other leading countries in the field. This development is estimated to generate new innovations which will reduce the greenhouse gas emissions from ships, lower operating costs and contribute to maritime safety. The development of maritime technology is also thought to challenge ports to develop their operations to meet the new needs of maritime transport.

Technology to address environmental issues

The Paris Agreement's central aim is to keep the global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. This poses significant challenges for maritime transport because the IMO has, based on the Paris climate agreement, set a goal to reduce the total annual greenhouse gas emissions by at least 50 per cent by 2050 compared to 2008. While the maritime sector's share in global emissions is currently at only 3 per cent, it is estimated to grow between 50 per cent and 250 per cent by 2050, if left unregulated. In 2050, the maritime sector could be responsible for 17 per cent of global GHG emissions, according to a study commissioned by the European parliament.

In addition to new energy production solutions, the development of digitalisation is considered one of the means to reach the goals set by the IMO. However, the strongly international maritime sector has not yet fully utilised the opportunities provided by digitalisation in order to contribute to the climate objectives. Consequently, by improving the current situation with regard to digitalisation and exchange of information, we can affect the greenhouse gas emissions from the maritime sector in two ways. Firstly, digitalisation is assessed to be an efficient tool in collecting, distributing and analysing data. Secondly, systems based on digitalisation and data utilisation are forecasted to profoundly change the current business models of the maritime sector. Substantial emission reductions could be achieved by, for example, optimising the freight transport capacity and sea crossings of ships as well as cargo handling in ports.

Digitalisation's positive effect on maritime

The development of maritime technology digitalisation is estimated to have positive effects on the whole marine logistics chain. In this chain, the ports act as digital links in a value chain and as transport hubs with hinterland and foreland connections. For example, the so-called Just-In-Time arrival to ports minimises the time spent in anchoring and enables optimisation of travel speed. Both of these still require developing the current transport contract models. In addition, the maritime sector needs data covering the whole logistic chain that is up-to-date, standardised and safe, and consensus on the benefits of sharing open data.

An important goal regarding the exchange of information in the EU is to

have the declarations and cargo documentation related to port calls and carriages by sea in a digital, machine-readable form and to follow the single report principle when saving data in the system. To achieve this goal, a regulation of the European Parliament and of the Council on electronic freight transport information has been proposed, and establishing a European Maritime Single Window environment is in process.

Risk management is essential

Developing the digitalisation and automation of maritime transport is forecasted to affect the safety of maritime transport. From a legislative point of view, the key issues concern the command and officers of ships. When ships become autonomous or remote-controlled, the question arises how the command of a ship is defined and demonstrated. Other central questions are related to rules of the waterways, training and qualification requirements of the crew, cybersecurity as well as liability, compensation and insurance issues.

In general, the development of digitalisation and automation is seen as positive from the point of view of maritime safety, since it brings along new opportunities for development. When a ship's navigation, engine functions, stability and other aspects are monitored both by the crew and from shore, it is deemed to provide redundancy and thus new kind of safety. On the other hand, the current technological development is seen as a threat. Encounters of traditional and autonomous ships at sea as well as poor situational and automation awareness in the remote-control centre are deemed to pose a risk of accident. In addition, the development of automation does not erase the possibility for a human error, but merely relocates it from sea to shore. To prevent these and other such risks from materialising into accidents, Finland considers that it is important to invest in the risk management of technological development both at the national and international level.

The Baltic Sea region is developing in cooperation

Finland is actively involved in the EU Strategy for the Baltic Sea Region. The strategy encompasses defining the common objectives for the region as well as an action plan for developing the whole Baltic Sea region and addressing common challenges. The Baltic Sea Strategy has three central goals which include saving the sea, increasing prosperity and connecting the region. The EU member states involved in the strategy are Sweden, Denmark, Estonia, Finland, Germany, Latvia, Lithuania and Poland. The strategy is also welcoming cooperation with EU neighbouring countries Russia, Iceland, Norway and Belarus.

The strategy includes 13 Policy Areas, of which the most significant for the maritime sector are the PA SAFE (Policy Area on Maritime Safety and Security) and PA SHIP (Policy Area on Clean Shipping). PA SAFE focuses on developing maritime safety in the Baltic Sea region. Denmark and Finland coordinate PA SAFE together. PA SHIP aims at contributing to clean shipping in the Baltic Sea and is coordinated by Denmark, Finland being involved as an active member. Other Policy Areas include PA TRANSPORT where maritime transport has a role as a part of the transport system of the Baltic Sea region. DS

Digital Ship *is media partner for the European research and technology conference TRA2020, which was due to take place in Helsinki in April 2020. This has now been postponed due to the coronavirus. More information can be found via this link https://traconference.eu/*

Automatic ferry enters regular service

www.kongsberg.com
basto-fosen.no/

Kongsberg Maritime has announced that the world's first adaptive ferry transit has been conducted during normal service. This landmark event, which took place last week on a vessel fully loaded with passengers and vehicles and demonstrated fully automatic control from dock to dock, is a key step forward in the integration of autonomous technology into everyday shipping operations.

The transit was made possible by close collaboration between shipping company Bastø Fosen, KONGSBERG and the Norwegian Maritime Authority (NMA). Bastø Fosen VI will now use adaptive transit functions developed from Kongsberg Maritime's advanced systems to enhance the daily operation of its Horten-Moss service, while continuing to carry a full complement of crew. The technology introduces new potential for the sustainability of diverse marine operations by providing a platform for optimised fuel consumption and reduced Greenhouse Gas (GHG) emissions. While supporting key elements of the UN sustainability targets for climate change, ferry owners and operators adopting the technology can experience tangible operational cost savings.

The fully-integrated digital system on Bastø Fosen VI automatically performs all docking and crossing functions to a high and repeatable level of accuracy, ensuring that best practice is followed to the smallest detail on every transit. The result is more exact timekeeping and improved customer satisfaction. During trials in December, Bastø Fosen VI consistently arrived within two seconds of the scheduled time.

"Today, at the press of a button, one of our vessels left the quay in Horten, crossed the Oslo fjord and docked in Moss, all completely automatically. This leaves the crew more time to focus on monitoring the vessel and ensuring passenger safety, which for us are the main motivations for adopting this technology," said Øyvind Lund, CEO, Bastø Fosen.

"Cooperation with KONGSBERG and the NMA has been crucial to the success of this venture, as has consultation with our captains and crew," he continued. "We have included them in this project from the start and have been delighted with how engaged they have been in its delivery. This is an aid, not a replacement. Greater accuracy permits better logistics: for example, we can now pre-program the time allowed for the crossing and thus reduce energy consumption. Digitalisation and automation are the future, and we are proud to be prime movers."

Kongsberg Maritime's Adaptive Transit system brings Bastø Fosen VI safely alongside.

Autodocking of the Bastø Fosen.

National and international regulatory bodies are still in the early stages of developing legislation to accommodate automatic marine operations, but through its work with Bastø Fosen and KONGSBERG on Bastø Fosen VI, the NMA have shown the world a clear path forward. "Norway is a small country, but we are very big within the maritime industry," said Svein David Medhaug, Norwegian Maritime Authority. "That gives us the ability to promote these advancements across a large part of the world's merchant fleet, and we're happy to be a part of that. Safety is the key issue for us, and we're delighted to work with stakeholders such as Bastø Fosen and KONGSBERG to ensure that this technology is both sustainable and safe."

Bastø Fosen VI now enters a six-month trial period during which the automatic system – called 'adaptive transit' – is expected to control the vessel for most services, but the captain will remain in charge and the bridge will be fully staffed. At present, the installed equipment is not fully autonomous – if vessels or objects are detected on a collision course an alarm will sound and the captain will take control.

An anti-collision system, comprising radar and electro-optical sensors, is expected to be fitted to Bastø Fosen VI this summer and be under test by autumn, but crew will remain on the bridge even as the level of autonomy increases. To maintain manoeuvring skills, Bastø Fosen's procedures will require their staff to perform manual transits on a regular basis.

The event consolidates Norway and the Norwegian maritime industry's leading position in the development and implementation of autonomous maritime solutions. Speaking from onboard Bastø Fosen VI, Gunnar Pedersen, EVP Integrated Solutions, Kongsberg Maritime, said: "Leaving the quay, crossing and docking again, all at the press of a button – this is a world first. It's super-smooth too, as we saw today. But without collaboration between a forward-leaning ferry operator like Bastø Fosen, the support of the Norwegian Maritime Authorities and a technology provider like KONGSBERG, none of this would have been possible. This is a big day for everyone involved – this is the future."

Training for effective ship management

The right training is essential to ensure mariners of the future are provided with the skills they need to operate advanced technology and enable shipping companies to gain value from their assets. Franck Kayser, CEO of V.Ships explains more.

Ship management is a discipline on the front line when it comes to integrating technology into our training and people management – with seafarers representing the largest mobile workforce in the entire global economy. Across the fleet of 600 vessels that V.Group manages, there is a network of 3,000 shore-based staff spread throughout 60 offices in 30 countries working in tandem with a global seafarer community of 44,000. The human aspect of ship management makes it one of the most important pillars supporting the entire shipping process, and as the discipline evolves, it will be vital to define how technology and people can come together to optimise operations. A big part of this will look at how technology and training can develop in ship management.

At V.Group, training enters into nearly every aspect of its operation, and is seen as a pivotal tool in ensuring robust, consistent and high-quality ship management and crewing. When it comes to crew training at V.Group, we see training as an outcome and solution rather than an off-the-shelf deliverable. Delivering this requires us to view training development with a consultative pair of eyes; before training can start, a rigorous training needs analysis is conducted, establishing training gaps using this insight to develop solutions.

Having established the training needs based on a robust analysis, careful consideration must be given as to which training tools could be employed – where we are seeing a rapidly developing and growing suite of choices. As well as the traditional classes and paper-based collateral, we are seeing an emerging use of simulators to train seafarers. However, we see that very often the best return on investment for training is generated by using more of the 'tried and tested' technologies. The role of simulators, classes, reflective learning drill and multimedia solutions such as digital e-learning packages should not be overlooked.

Underpinning these training activities is the digital infrastructure, ShipSure2.0, which while being a vital tool supporting day-to-day ship management, can also support the robust training needs of seafarers by logging training data and identifying areas where more training is needed. Through integrating digital learning and mandatory training uptake amongst crew, shore-based

Franck Kayser, CEO of V.Ships.

fleet managers can have an active insight into the current state of training amongst the crew. This is particularly helpful in enabling fleet cells, the basic unit of ship management, to be proactive around training needs, and providing meaningful support to ensure training is kept up to date.

One area where training is becoming particularly vital is by establishing an accountable, safety orientated culture in ship management. This involves generating a flatter, more dynamic leadership style as opposed to the past, which saw a traditional, deeply hierarchical and stiff approach to leadership. By having all ranks empowered to speak up and report areas where safety is compromised – in line with their training – then a collaborative culture around ship management is developed. Safety driven shipping and ship management correlates strongly with reliable, efficient operation, and consistent high quality, so the incentives for safety are tangible for all parties.

Given the trends and trajectories of the shipping and ship management industry, we need to make sure that the right skills are embedded within the mariners of the future. We are seeing an increasing host of technologies emerging, and greater maturity around exploitation of data, these will be a significant pillar in establishing training needs and developing solutions. The role of training will become closer and more collaborative within shipping and ship management if owners are to stay ahead of the curve in ensuring continued generation of value from their assets. DS

Wärtsilä and PSA Marine complete autonomous tug sea trials

www.wartsila.com
www.psamarine.com

Wärtsilä and PSA Marine have successfully completed initial sea trials for the "IntelliTug" project. The PSA Polaris, a harbour tug owned and operated by PSA Marine, has been retrofitted with a suite of Wärtsilä technology to enable autonomous navigation.

The project is a collaboration between technology provider Wärtsilä, marine services provider PSA Marine, classification society Lloyd's Register, the Technology Centre for Offshore and Marine Singapore (TCOMS), and co-funded by Maritime and Port Authority of Singapore's (MPA) Maritime Innovation and Technology (MINT) Fund.

Screenshot of the smart navigation system's development platform co-created with the Tug Masters. Image courtesy of Wartsila.

Carried out in Singapore, the trials commenced in September 2019. They verified the IntelliTug's capability to avoid a variety of obstacles, including virtual and real-life moving vessels. These trials are Singapore's first for commercial Maritime Autonomous Surface Ships (MASS) using the MPA MASS regulatory sandbox, which has been established to facilitate the testing of MASS and other autonomous technologies in a safe and controlled environment within the Port of Singapore.

The IntelliTug trials are part of MPA's MASS initiative, which aims to accelerate the industry's R&D capability in this field and validate new MASS-related concepts of operations and technologies. This would enable technology developers, the research community, and maritime stakeholders to capture future MASS-related opportunities.

"It is critical that we prepare the Port of Singapore for MASS. With MPA's MASS regulatory sandbox, I am glad that Singapore can contribute to the sea trials and eventual adoption of MASS. We will be happy to share our MASS experience with other ports and coastal administrations," said Captain M Segar, assistant chief executive (operations) of MPA.

The PSA Polaris is a 27-metre harbour tug with dual azimuth thruster controls. It has been fitted with a sensor suite, including Wärtsilä's RS24 near-field high resolution radar and Wärtsilä's Dynamic Positioning (DP) system, to enable autonomous capabilities. Data collection via the sensors has been ongoing since the start of the project in conjunction with the development of a collision avoidance algorithm.

The project is aimed at developing and field-testing intelligent vessel capabilities and viable pathways towards smarter, safer, and more efficient ways of operating a harbour tug. This is achieved through the provision of human-centric technology, design-thinking, and man–machine collaboration.

Before sea trials commenced, system integration and digital testing began with the use of Wärtsilä's autonomous ship simulator. TCOMS has carried out further validation of the various data gathered from the sensor suite, as well as real-world performance of the tug through a physics-based digital twin that incorporated the effects of the physical environment faced in the sea trials. Lloyd's Register has been closely involved throughout the project to support the development of the trials' safety case, while collaborating on the human factors and technology design processes.

During the sea trials, a new smart navigation system - which was developed during the project in cooperation with PSA Marine's Tug Masters - was used to select destinations for the hundreds of test cases carried out. The system allows the user to easily see the routes plotted, with the avoidance of collisions, in real-time. The smart navigation system also sends track and speed commands to the DP system, which drives the vessel along the route safely at varying speeds up to 10 knots. These manoeuvres are expected to follow set behaviours and meet success criteria to reach the destination.

At all times, the PSA Marine Tug Masters were able to determine if the tests were safe to continue and had full control to abort testing at any time where required.

"Wärtsilä continues to lead the marine industry's transformation into a new era of digitisation and decarbonisation – achieving greater efficiency, improved safety, and better environmental performance through its Smart Marine approach. The IntelliTug project provides a clear picture of the potential that this approach can unlock, to the ultimate benefit of owners and operators everywhere," said Mervin Ong, managing director of Wärtsilä Singapore.

Wärtsilä and PSA Marine will continue development work on the IntelliTug and its systems throughout 2020, working towards continuous deployment of smart capabilities in real-life harbour craft operations to complement and enhance the capabilities and experience of human tug masters.

Investing in technology during times of uncertainty. Is the time right?

COVID-19 has affected the way businesses operate and many are taking a step back to review dated systems and internal technologies as they look for new ways to save money and mitigate risk. However, businesses are still willing to sign off technology purchases that help to deliver quick and quantifiable ROI, writes Jenna Brown, Shipamax co-founder and CEO.

It's a challenging time for the global economy. COVID-19 has seen sales numbers plummet, sending businesses of all sizes into survival mode. With tighter cost controls in place, businesses across the logistics industry are freezing long term IT programs, leaving project resources sitting idle while we ride out these turbulent times.

It's clear that the number one priority is keeping business healthy, and now more than ever, the spotlight is ensuring efficient work practices are a top priority. As a result, we're seeing businesses use this time to take a step back to review dated systems and internal technologies as they look for new ways to save money and mitigate risk.

Jenna Brown, Shipamax co-founder and CEO.

Automation technology is now more relevant than ever

Before COVID-19 shook the world, automation was already a fast-growing trend throughout the logistics industry. In a recent survey of business leaders by EY, 41 per cent of respondents said they were investing in accelerating automation as businesses prepared for a post-crisis world.

Despite uncertain market conditions, it's clear many businesses still have one eye on the future, with the objective of emerging from the current crisis in a stronger position. Interestingly, what we're seeing is that businesses are still willing to sign off technology purchases that help to deliver quick and quantifiable ROI. Document automation fits this mould.

Has there been a better time to invest in automation technology?

With many companies freezing IT programs with hefty financial commitments, project resources are available to spearhead change. Unlike many IT transformation initiatives, Shipamax's document automation solution is a light touch - we offer a fully packaged, predictable implementation programme that's managed by our Customer Success team. We've found end users can get up to speed in less than 30 minutes - a relief for implementation managers responsible for driving new initiatives during this remote period.

It's no secret that document automation technology can address back office inefficiencies. In the current climate, driving efficiencies is more important than ever, and will ultimately help freight forwarders set up for future success.

What is Shipamax doing to help businesses in the current market?

Shipamax is committed to helping global logistics companies generate efficiencies during these uncertain times. We've made some changes to our commercial offering that we believe will allow new customers to invest in technology without a big budget.

Consumption based pricing model: Our consumption-based pricing model can be scaled up and down depending on your business needs. So, during these uncertain times, your software costs will be matched to your demand.

No implementation fees: Our out-of-the box integrations with popular systems such as CargoWise and Microsoft Outlook mean you won't have to stump up for hefty implementation fees before you see a return on your investment.

Flexibility on terms : We're working closely with new customers to set out terms that work for all parties. We understand that market conditions are unique, and we want to make sure that as a solution provider, we're giving our customers the opportunity to generate maximum value from our technology. If you have budget freezes, or resource uncertainties, let us know & we'll make sure our agreement ensures you're not taking on unnecessary commitments.

Is the time right to invest in document automation technology?

These are unprecedented and uncertain times for businesses, but there is an opportunity to emerge in a position of strength. If you have idle project resources that need to be utilised, and are looking for a project with minimal risk and high ROI, that will help generate efficiencies in a crisis, perhaps now is the ideal time to invest in automation technology. DS

Managing a crisis: COVID-19 and the threat to Critical National Infrastructure

Despite, the current COVID-19 crisis, the maritime industry continues to operate, transporting essential goods across the globe. Offshore companies should take extra precautions to protect their staff and ensure the effects of COVID-19 on personnel are mitigated, says Jules Rawles, director at specialist medical support company, SSI Energy.

In the midst of uncertainty and significant risk to people's health, it is clear that the need for robust and accurate screening and testing of COVID-19 is needed now more than ever.

The social and health implications of COVID-19 have already been well documented. However, what still remains largely unclear, is how badly our Critical National Infrastructure and supply chain is going to suffer and what measures can be put in place to preserve it, especially offshore.

It is imperative that workers involved in the energy industry are supported in their efforts to keep operations running. These are the personnel who will keep the lights on in homes across the country and heating in the homes of those who really need it. At this time, certain industries have a particular responsibility to keep operating.

Offshore activities need to continue, and staff need to be able to operate effectively in an environment with varying information and protocols. Vessels, for example, must pay particular attention to all personnel on the pre-embarkation and embarkation stage of deployment. Any personnel suspected with the virus must be dealt with effectively and sympathetically; human resources staff must have systems in place to ensure the wellbeing of all involved is catered for.

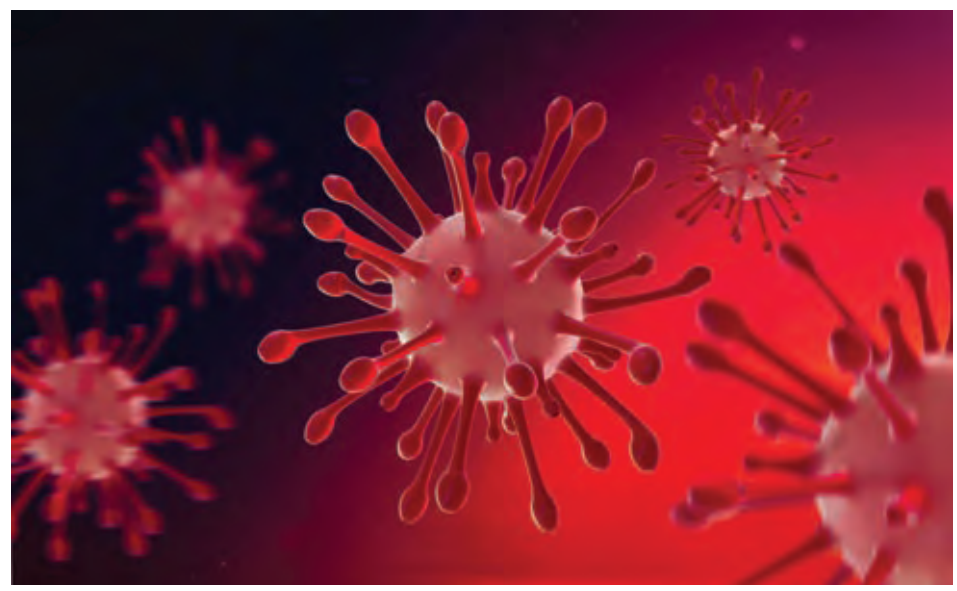
According to Jules Rawles, director at specialist medical support company, SSI Energy, there are three core ways companies can help mitigate the effects of COVID-19 for their offshore personnel:

#1 Implement robust screening measures

These can be instigated at reception centres, ports, and heliports. Key data can be obtained by carrying out assessments on paper such as detailed questionnaires and taking temperatures using a non-contact thermometer. If any personnel display symptoms under screening or assessments are indicative of an increased risk, they will be advised to self-isolate for 7 – 14 days, as per the Government's current advice.

#2 COVID-19 rapid testing

The next layer of mitigation can be conducted using a COVID-19 rapid testing kit. This testing kit is particularly useful for the testing of personnel based offshore and must be conducted by a registered health care professional.



Offshore activities need to continue, but staff need to be able to operate effectively in an environment with varying information and protocols, says Jules Rawles, director at specialist medical support company, SSI Energy.

The COVID-19 rapid testing kit detects IgG and IgM antibodies and can assist in determining whether the person has COVID-19 or not. The kit gives a positive or negative result in just 10 minutes and is used as an in vitro diagnostic tool to precede precautionary measures that will need to be put in place to manage the spread of the virus.

#3 Strategic advice

Determining a suitable course of action for mitigating the effects of COVID-19, requires the expert advice and strategic management of a qualified medical professional. Having an experienced medical professional to advise senior management and board members as to what the future may look like, is important for business continuity and the future. DS

How maritime start-ups can help address critical challenges today

According to experts speaking at *Digital Ship's* Maritime Digital Transformation forum in February 2020, start-ups can help transform the maritime industry by allowing new blood to enter, bringing fresh ideas, innovation, and transparency to help address critical challenges today.

Start-ups are expected to play a vital role in the maritime industry over the next several decades[1]. Tougher regulation and ambitious environmental goals require the traditionally conservative and fragmented shipping industry to become more adaptable, flexible and collaborative. For maritime start-ups, there is an opportunity to bring innovative ideas and approaches to help the maritime industry navigate an efficiency-focussed and digital era.

According to Tarang Valecha, co-founder and CEO of Danish start-up, Nautix Technologies, the maritime industry is beginning to see a start-up culture.

Overcoming current challenges

Start-ups play a role in overcoming some of the issues that regulation has not been able to address, for example, improving transparency to drive better behaviours for safe and efficient operations.

According to Daniel Kampman, CEO & Partner of Alpina Chartering, when it comes to bunkering there is a huge lack of transparency in the industry. Kampman believes that this hasn't really been addressed before because the bunkering industry isn't transparent and doesn't really seem to want to be. "The margin is in non-transparency and that's the issue we are facing," he said. Start-ups can partner with shipping companies, which want transparency on technologies or solutions they might be using, to help change this. One way to do this is to provide ratings as, "Ratings are one of the most powerful tools to change behaviour," he said. "Most people won't book a hotel room without reading the ratings reviews."

Alpina has developed a platform for operators and managers to grade how bunkering performance is going. "They give a rating to the supplier and we collate data and merge them with data regarding quality, timing, and quantities. Based on that we make a rating of suppliers and bunker barges to help improve transparency across shipping operations."

According to Tarang Valecha, co-founder and CEO of Danish start-up, Nautix Technologies, the maritime industry is beginning to see a start-up culture, but to create an environment that is able to help start-ups grow, the industry needs to collaborate both within and outside of maritime and collaboration needs to become the culture. "We need to look outside the maritime industry into the software industry for example. Start-ups have to talk to each other and work together. Competition is good but we should still collaborate as we will add more value and the industry will rapidly grow."

Peter Schrøder, chief data officer at Maersk Tankers believes that, "We can't alone make solutions that will change the industry. We need some new blood in to think differently and change things. This is super important. Today, a lot of leadership teams don't feel as though there's the right platform so that's why there's been no change."

Lessons learned

Innovation is difficult and there can be multiple reasons why things go wrong in a corporate setting, according to Erik Lund, managing partner, LundConnect. So, what are the best practises for moving forward?

Kampman believes that one reason it is difficult for start-ups to establish themselves in the small conservative shipping industry is because many will turn to people they already know. "Being a start-up in the shipping industry is one big challenge. It is conservative, we do it our own way, based on gut feelings. Our decisions are based on history, contacts, networks we already have. Everybody is used to talking on the phone and calling somebody they know."

One experience Kampman refers to is when the company launched its own technology, BunkerTrust, in 2017 to help increase transparency in the bunker supply chain. "One thing we did wrong with the BunkerTrust is that we didn't follow integration from the outset. The key point here is integration. You need to be able to integrate your offering into what is out there. If we had done this, everything would have been much easier."

Another area to address according to Valecha is changing the mindset, which also ties into collaboration. "Carrying cargoes that can be dangerous requires a change in mindset. We need to see technology as a competitive advantage and not be scared of trying new things. We should have a model to attract start-ups for talent to try things and fail. Collaboration is important for success."

To present the best opportunity for collaboration, companies should, "be in a state to work with you," says Peter Schrøder of Maersk Tankers. "This requires a lot from the organisation to be ready to do that. The industry has been depressed for many years. We have to focus on the dollar and where can we deliver some real impact on industry that can draft some returns. That's why our notion from day 1 has been to follow the dollar. To look where we can make an impact with technology to change the industry. This is a key focus for us. We want to cooperate. People that have good ideas, we welcome them."

Rasmus Elsborg-Jensen, CEO & founder of ReFlow Maritime said that another challenge start-ups face is to do with trying to be sustainable without, "making it too fluffy." He believes that while you have to be sustainable, it is all about cost savings. "We went out and talked about sustainability and it opened a lot of doors. But sustainability is not enough to make decisions, so we had to go back and ask how do we identify scenarios where sustainability plays a role that with go hand in hand with cost savings. That's what we've been working on with our partners."

Balancing collaboration and competition

When it comes to collaboration, one issue faced by technology companies is that a lot of clients are also competitors at the same time. How do you share knowledge without giving away your competitive advantage?

According to Maersk Tankers' chief data officer, a lot of the inefficiencies in the shipping industry are due to a lack of information. He warns that there are brokers out there that use this to their advantage. However, he believes that, "By very different parts of the value chain coming together and delivering a transformation, it could all help us to become much better.

"Maybe the broker won't exist the way it does today, but everybody has to recognise that it is going to change and it is better to be part of the change than waiting for it to happen. I think that it has to change the mentality and mindset of people, and there needs to be new blood driving this change in the industry, but I think this is starting to happen."

Valecha advises that it could be sensible to implement a strategy when it comes to data sharing to remain competitive. "If you can choose what data you'd like to share, a strategy on what you're willing to share, what's not confidential."

He also believes that it is sensible to understand the business case of sharing data and advises businesses to, "Have an idea of what value you will get out of it if you are sharing. If a vendor comes to you and says please give me your data, that is not a huge business case for you. But if they are adding value by this sharing then that's a unique case and you will get more value out of data sharing."

Elsborg-Jensen of ReFlow Maritime says that they key to this is to treat data in a safe way. "When you share data, you have to be mindful to share non-sensitive information. If you have this strategy and can communicate to clients, then they will see the benefits of it as they will see the value of big data. They know that the more data they have the better decisions they can make. My experience is that most shipowners realise this." DS

[1]How start-ups are driving the next generation of maritime trade

Training tomorrow's seafarers the smart way

The next generation of marine simulation solutions should address shipping's accelerating pace of technological change and a widening skills gap among seafarers.

If a ship's crew from the 1970s were teleported ten years into their future, the ships of the 1980s would hold few surprises. The same could not be said over the last two decades. Today's ships are almost unrecognisable compared to those of the early 2000s thanks to the emergence of modern communications and navigation systems (including electronic chart displays) as well as electronic engine controls and a diverse number of emission abatement technologies below deck. And as technology advances, the rate of change will only increase.

The regulatory framework for crew training, IMO's International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), is struggling to keep pace. A painstaking multilateral decision-making process means revisions can take a decade to adopt and even longer to implement into the curriculum. Meanwhile, the skills needed in the maritime workplace keep evolving, says Neil Bennett, global director of simulation at Wärtsilä.

Competence gap

"Over the last 25 years we have witnessed a continuing increase in the gap between competence provided by regulated training and the training required to achieve competence on the modern equipment found on vessels in operation," he says.

One result of this lag is that shipowners are having to introduce their own training to fill the gap. Bennett notes a dramatic increase in the proportion of non-regulated training compared to regulated training provided to seafarers. But this opens the problem of widely varying training practices, as Reto Weber of Chalmers University of Technology explains.

"Many companies, cruise ship operators for example, really want to see their seafarers developing and have crews coming in for training on a regular basis. Others just want to do what the regulations say. They want the certificate but don't care about the course content."

One way to improve consistency of training is the use of simulation to familiarise cadets with systems and situations. As simulation technology has improved over recent years – driven in part by advances in associated industries such as video gaming – it has become an integral part of the seafarer training curriculum and a well-established platform for delivering essential skills.

Weber, who focuses on full-bridge simulation training at Sweden's widely recognised maritime school, lists many other benefits for students compared to relying on at-sea training alone. "They get far more practice. They face more situations and more challenging situations, and you can increase the difficulty as they get better."

Wärtsilä's own offering highlights the diversity of simulation training available. Its Wärtsilä Voyage business supplies academies and ship owners with navigational training platforms and content based on its Navi Trainer Professional (NTPro) systems and a Technological Simulator (TechSim) portfolio comprising engine room and liquid cargo handling simulations.

Regulatory limits

Despite its widespread application and proven effectiveness, STCW regulations limit how much of a cadet's required experience can be gained in simulation versus at-sea training. According to Johan Ekvall, navigation simulation solutions manager at Wärtsilä, allowing increased simulation time in the seafarer curriculum would accelerate and improve training and help to close the competence gap.

"Sea time is still very important as it provides experience which cannot be reproduced in a simulator, such as the psychological factors being on a ship," says Ekvall. "But the efficiency, quality assurance and the breadth of training situations a simulator can bring to training is superior to training done onboard. We believe that more time in simulation training could shorten the time for both cadet training and promotions, and even improve the quality if the training objectives are clear and the training is well designed".

An ongoing revision of STCW may recommend that flag states allow for greater simulation time in training. But other challenges will remain. For Chalmers' Weber, one such challenge is making sure that cadets can use time in the classroom effectively.

He explains: "Although IMO's Maritime Safety Committee has approved guidelines for the standardisation of user interface design for navigation equipment, the bridge of today contains a wide array of manufacturer specific interfaces. Companies increasingly want seafarers trained on the equipment they will be using. Often when people come for a course, they need time just to understand basic controls and where to find things on that specific equipment. That limits the training you can do."

Distributed learning

Emerging solutions may help solve this problem. Among them is the development of 'distributed learning' courses; cloud-based training programmes that cadets can access beyond the classroom. This could allow for the development of short pre-courses to familiarise cadets with specific equipment types, for example. But more widely says Ekvall, it will make it possible to train anywhere, at any time and with individually tailored content. Wärtsilä is working closely with some of its major customers on pilot programs for its cloud-based solutions, which will enable schools to provide access to simulators away from the classroom via browser on PCs, laptops, tablets or mobile devices.

Preparing recruits to operate specific equipment models, as opposed to generic radar or ECDIS courses, will require different content as well as more flexible delivery. Wärtsilä is now developing type specific training packages, intended to train recruits on the use of Wärtsilä's wide range of bridge, engine room and cargo handling solutions.

The first of these packages has already been launched, for Wärtsilä's liquefied natural gas (LNG) fuel supply solution LNGPac. According to Bennett, the company ultimately hopes to offer type specific training packages for all Wärtsilä solutions, as well as using the packages as a base from which to develop training simulation for generic equipment.

It is not just the software element of equipment training that schools need to wrestle with. Reconfiguring hardware to the requirements of ship operators' specific configurations is another costly and time-consuming issue, notes Weber. Another set of emerging technologies may soon provide one answer.

Smart realities

According to Vittorio Esposito, technological simulation solutions manager at Wärtsilä, the company's forthcoming Smart Realities rely on "virtual reality with a kick". By combining a virtual reality environment with the mathematical, physical and environmental models that power Wärtsilä's simulations, Smart Realities will place students on a virtual bridge or engine room and provide a more immersive experience than the joypad, controls and monitors that currently mediate the simulation experience.

Smart Realities will ease the burden schools face in changing configurations in simulator rooms, but it will do much more besides, says Esposito. He explains that the new, cutting-edge tools will appeal to today's younger recruits far more than more conventional methods. Thus, bringing exciting technology to seafarer training can also play a role in making shipping a more attractive career choice.

Smart simulation

Virtual reality, distributed learning and type specific training are just some of the emerging possibilities which will help prepare tomorrow's seafarers for a ship environment that is becoming increasingly complex. For Wärtsilä Voyage, these solutions form part of the Smart Simulation vision, explains Bennett.

"Smart Simulation is the next generation of our market leading simulation platform, enhanced and redesigned for a rapidly changing, digitised maritime industry and the next generation of seafarers," he says.

Wärtsilä Smart Simulation will be officially introduced at Wärtsilä's Transas simulation user conference, SIMUC 2020, to be held at Solent University in Southampton, UK*. The objective is to provide ultimate flexibility for all users in the location, scale and type of training they deploy. To achieve this, Wärtsilä aims to put its entire simulation and training offer across multiple media – from traditional classroom-based simulation through to the virtual reality and distributed learning models under development – under a single software platform.

Seafarer training will come under even greater pressure in the face of shipping's high-tech future and accelerating pace of change. A smart approach to simulation is needed to help schools, companies and new recruits keep ahead of the challenge. DS

Reto Weber of Chalmers University of Technology says that full-bridge simulation enables cadets to benefit from additional practice and face more challenging situations. Image courtesy of Solent University.

**SIMUC 2020 was originally due to take place June 16-18, 2020. Due to COVID-19, the event has been postponed. More information can be found via this link https://www.wartsila.com/marine/events/simuc-2020-conference.*