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DNV – beware new safety risks from new systems

New digital and environmental technologies can mean that ships are exposed to new risks – such as cyber incidents, alarm 'floods', and problems due to lack of crew familiarity with new fuel systems, says DNV in a white paper. But the solution is with people, not machines

New digital and environmental technologies will mean that ships are operated in different ways, and new risks will be introduced. So it is important that shipping companies think carefully about them.

That is the topic of a DNV white paper, "Closing the safety gap in an era of transformation".

Considering the potential benefits of these technologies, it would be a pity if the increased risks became an obstacle to their roll-out, says Knut Ørbeck-Nilssen, CEO Maritime with DNV.

Fenna van der Merwe, Principal Consultant in Human Factors, Safety, Risk & Reliability at DNV

Examples of sources of increased safety risks are cybersecurity risks, automation systems which crew are unfamiliar with or which is hard to use, and new fuels which people are not so familiar with.

Also, remote operations mean that people are working together in new ways, so conventional methods for spotting and mitigating risks may no longer work.

"Safety at sea is our purpose as a classification society. So we have put a lot of effort into investigating what we see as a looming safety gap," he said.

"With all eyes focused on digitalisation and decarbonisation, we want to highlight the importance of the industry staying just as committed to safety," added Fenna van der Merwe, Principal Consultant in Human Factors, Safety, Risk & Reliability at DNV and project manager for the white paper. "We have to make sure the future isn't compromised."

"Complex innovative technology is key to making these transformations happen, but it is not enough. We need to strike a balance between focus on this technology, and focus on the human element and organisational element. It is that interaction which creates that emerging property of safety."

Defining safety

Safety can be defined as a property of maritime systems which are "resilient, robust, and have processes in place for continuous improvement," Ms van der Merwe said.

"Robustness" can come from the systems we have in place, including regulatory frameworks.

"Resilience" is more of a human factor. "When we talk about resilience we are referring to this proud history of seamanship. People have been able to catch on and react to unforeseen circumstances, have led the way in being agile, to make the best of the situation."

"Situations today may be safe, but we can't assume they will be safe tomorrow."

"We need processes of continuous improvement to get that feedback loop going, to support an increased robustness in maritime systems."

Human, organisational, technical

The core idea could be described as "holistic risk understanding", covering human, organisational and technical elements.

The biggest safety gaps may be in the interaction between these elements.

For example, an alarm system is an interaction between the technical system and a person. If it does not help the person understand the problem, the interaction is not working.

People need to feel that whatever 'smart solution' provided to them is actually helping them do their work better.

"If we leave out any of these parts of the equation we can't be sure we have the total risk picture in place," she said.

Digitalisation

One particular challenge with digitalisation is that "it brings about a lot of system complexity," particularly with systems getting more interconnected, leading to

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underperformance and other difficulties, she said.

Traditional risk management approaches, focussing on reliability of individual components, a bottom-up approach, are not enough.

You need to supplement it with a top down approach, looking at the system as a whole, and with more testing / verification, she said.

Another change driven by digitalisation is remote working – work being moved from ship to shore, and people working in dispersed teams in different locations.

"This can be very effective in terms of the type of expertise and also the productivity of collaboration. But we can't just assume that people will still be working in traditional ways."

"People will communicate in different ways, the responsibilities of specific roles change, the information requirements change. All of these influence people's ability to work."

Sometimes there are choices of what work can be done by machines and what is done by people. Each should do what they are best at, but the whole thing should be centred around the human, not the machine, she said.

"What technology is better at doing than people is mundane, tedious jobs that are done over and over again. We don't need to spend our human ability to think creatively about those tasks," she said.

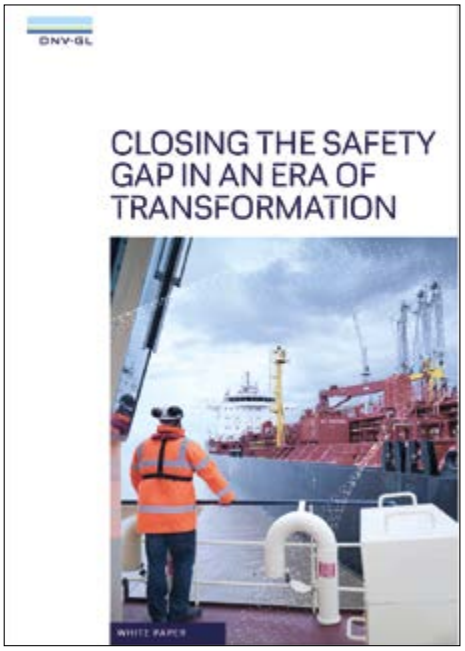
"We need to invest in our ability to think more strategically, more tactically in the importance of operations. Let's focus more on how we can use this problem solving ability and ingenuity to really optimise maritime operations, and leave the more boring and tedious work to the systems."

"We shouldn't be afraid that technology is taking over some parts of operations, that free up time for us to work on what we are really good at."

Another change is that organisations are drawing expertise more and more from sub suppliers and vendors. While it is useful to draw on multiple sources of expertise, it is also important that everyone can see the overall risk picture and mitigation measures, "so everyone has their nose in the same direction."

DNV was involved in a project to address alarm 'flooding' and the system integration and standardisation needed to combat it, engaging with representatives of the whole supply chain.

"On a bridge there's a lot of beeping, honking, with alarms really distracting the mariner from their tasks," she said. "This can create a so-called 'cry wolf' scenario. The mariner doesn't focus on the alarm which should draw their attention, which is a huge safety risk."



DNV's new white paper

"There are huge challenges understanding what the situation is at hand, knowing what the

cause and effect is, trying to understand the text message that goes alongside the alarm."

DNV recommends appointing someone in the role as 'system integrator' early in the process of designing a bridge system. This person can "act as a spider in the web, oversee the whole process of alert management systems, and improve the presentation of alerts," she said.

There can be enhanced verification processes, such as a "hardware in the loop" test.

There could be joint industry projects working on creating systems which present the exact right information at the right time and in the right way to the right person.

Any digital transformation strategy needs to include a management of change process, so people at the top of the organisation are monitoring how the risk picture may be changing.

Decarbonisation

In the world of decarbonisation, new risks may be introduced from using new fuels, which involve new organisational and technical aspects.

Risks can be made worse by the "silo-isation" of industry departments. This means that knowledge held by one department may not be shared with another that needs it.

Shipping companies may not be able to rely on regulations to enforce adequate safety management, because regulations can only usually be written after technology has been developed.

"While we're waiting for regulatory frameworks to become more robust, it is up to the industry to work together, through exchange of experience and knowledge, to build that robust system."

We need "to take care to develop the marine competence, and competence development programs" about different fuels. "Making people aware of the risks that can be out there so they can manage them in due course."

"We call it 'creative worry' – so you become very risk aware. You close the loop of continuous improvement, by reporting incidents and reporting best practises."

People

"When I talk about humans I'm talking about people. Not just seafarers, also maintenance engineers, suppliers, vendors, managers on shore, the people behind the regulations," she said.

"We all have a piece to contribute to the puzzle. We have this tremendous effort to be creative and resourceful, in our ingenuity and problem solving ability, which technology has not been able to substitute for us."

"We can support performance, so people are able to do things right and prevent them from doing things wrong."

"Every maritime stakeholder has a responsibility and ability to really make sure we create safe and efficient operations, and to scaffold the social, mental and physical wellbeing of people.

"We are more than ever before coming to the realisation the people are the key, whether you are onboard the vessel or helping support managing the vessel from the shore side," added DNV's maritime CEO, Knut Ørbeck-Nilssen.

"This is a big part of the message in the white paper that Fenne presented. How can we, collectively as an industry, increase the level of knowledge amongst, for instance, the seafarers."

"The challenge is that systems, as described, are becoming more complex, more integrated, more controlled by software in the background. It is not like it used to be in the old days where you could easily see the diagram on the wall of the ballast system. You switch here and there and understand easily how everything works."

One of the best ways to better familiarise people with how technology works can be e-learning. "We have an amazing opportunity with modern technologies to simulate, do training. That could be on the operational issues, also on managing hazards and incidents," he said. These simulators are becoming more available."

Another important way that people maintain safety is through surveyors, such as those employed by classification societies like DNV.

"Surveyors have for years been going onboard the vessel, checking out a lot of details, some really important things," he said. "A lot of what can be seen to be not as important, but if neglected over time, could easily develop into something important."

As people, "we have the best sensors, a brain that can rationalise, we are really fast to understanding situational complexity.

"If we have more time to devote to those areas, by not been pre-occupied with manual tasks, these will be the main tools to help us manage a situation."

How to move forward

The white paper itself is intended to "offer a framework as a basis for discussion that starts with collaboration."

The discussion should be about how "to get this framework into place so we can look forward and see how we can meet these ambitions in a more digitalised and decarbonised future," Ms van der Merwe said.

Moving forward with measures such as appointing additional people as 'systems integrators', will mean additional costs for shipping companies, which they will not be very enthusiastic about.

The paper does not look at the costs at this stage – although the costs are clearly lower than the costs of major accident.

"The cost of safety is not an addition, but rather as part of the overall investment in digitalization and decarbonization if we want to succeed in achieving safe and timely digitalization and decarbonization," Ms van der Merwe said.

DNV services

DNV has a class notation for "Enhanced System Verification (ESV)", including services related to "Hardware in the Loop" (HIL) testing.

It also has class notation for "Integrated Software Dependent Systems (ISDS)".

"These are examples of initiatives that promote testing and verification throughout the system life cycle to ensure that complex systems work together when they are needed the most," Ms van der Merwe says.

DNV GL's digital features rules for ship classification which entered into force on 1 January 2021 also provide a framework for assessing and visualizing digital features of vessels, she says.

This offers stakeholders a platform for demonstrating cutting-edge technologies and unlocking the value that is brought to the market.

Another related document from DNV is one about competence related to onboard use of LNG as a fuel standard (2014). TO

DNV's 24 page white paper, "Closing the safety gap in an era of transformation" can be downloaded online here

www.dnv.com/maritime/publications/closing-the-safety-gap-in-an-era-of-transformation-download.html

Cyprus – seafarer vaccinations, green incentives and ETS

We spoke to Vassilios Demetriades, Shipping Deputy Minister of Cyprus, about Cyprus' proposal for seafarer vaccinations, a green incentives scheme for ships under its flag, and the EU Emissions Trading Scheme for shipping

Cyprus has interesting proposals for managing seafarer vaccinations, and giving incentives to shipowners under its flag who go beyond the required minimum on decarbonisation.

Cyprus is also playing a useful intermediary role between the shipping industry and the European Union as the EU plans to subject shipping to the Emission Trading Scheme (ETS), as an EU country with close links to the shipping industry and high levels of maritime expertise in the government.

Vassilios Demetriades, Shipping Deputy Minister of Cyprus

We spoke to the top shipping government official Vassilios Demetriades, who is fairly new in his role, being appointed in July 2020.

Mr Demetriades had previously done a 5 year stint as policy officer in the Directorate General of Mobility and Transport of the European Commission, co-ordinating the EU maritime transport strategy and its revision as well as the EU's external maritime transport relations.

Before that he was Head of the EU Affairs Unit at Cyprus' Ministry of Transport, Communications and Works, which was in charge of shipping and maritime policy at the time.

Mr Demetriades official title is "Shipping Deputy Minister", due to Cyprus regulations which limit the number of "ministries" the government can have. So the government department which looks after shipping is formally called a "deputy ministry".

Cyprus is working on a long term strategy for Cyprus shipping covering the next 10-20 years, Mr Demetriades said. "We will invite the shipping community to submit their proposals, ideas, suggestions. You will hear more from us by mid-March."

Mr Demetriades sees his ultimate goal as to continue growing Cyprus shipping and further develop the maritime cluster and flag. This includes through continuous updating, simplification and modernisation of the legislative framework, quality improvements to the services, and strengthening collaboration across the public and private sectors.

Seafarer vaccination

In February 2021, Mr Demetriades wrote letters to the EU Transport and Health Commissioners and IMO Secretary-General, outlining a proposed program for seafarer vaccination.

It suggested that for vaccination purposes, the maritime industry should be split into short sea and deep sea.

According to the proposal, seafarers working on short sea shipping, such as where voyages start and end within Europe, should be included under national vaccination measures of the seafarer's home country.

For deep sea vessels, each vessel should be considered a 'bubble' for Covid purposes, if they have not had any contact with anyone else for at least 2 weeks. This means that the ship itself can then be considered a Covid free zone and seafarers onboard should not be treated as a Covid risk.

The attention should go on seafarers who are "sitting on the bench", to use a football analogy, he says. We need to ensure they are infection free before they come onboard, whether from quarantine, testing or vaccination.

There should be a co-ordinated global approach to ensure there is enough approved vaccines made available to seafarers in their country of residence, he said.

Since other countries have an interest in this, they could support seafarer home nations like the Philippines and India, perhaps by providing vaccines to the country with a stipulation that they should only be given to seafarers.

Since two doses of vaccine are required, it is more practical to vaccinate in seafarers' home countries, rather than in ports they visit, because they do not visit the same ports regularly.

If seafarers need to go to special seafarers' vaccination hubs, it would be a "logistics nightmare", he said.

At the moment, many people are saying that seafarers need to be vaccinated, but we

are a long way from a practical plan, he said.

"My fear is that towards the end of this year [2021] a big proportion of the population will get the vaccination, we will go slowly back to normal, then we will still be discussing about the seafarers, who is going to arrange their vaccinations, at which port."

"I'm pleased to use the approach we are presenting to alert all these stakeholders and interested parties to discuss the way forward."

Cyprus was one of the first countries worldwide that recognised seafarers as key workers and implemented a formal crew change process, Mr Demetriades says.

Green incentives

Cyprus' Green Incentives program rewards vessels under the Cyprus flag which go beyond the minimum on decarbonisation, with a reduction in the tonnage tax they are required to pay.

The program starts for the 2021 fiscal year, and offers tax reductions of up to 30 per cent in total.

New vessels that have a better EEDI than is required will obtain a tonnage tax rebate of between 5 and 25 per cent.

Vessels using an alternative fuel (not LNG) and achieving CO2 emissions reductions of at least 20 per cent in comparison with traditional fuels will receive a rebate on annual tonnage tax of between 15 and 30 per cent.

Vessels which demonstrate a reduction of total fuel consumption in relation to the distance travelled, compared to the previous reporting period, under the IMO Data Collection System (DCS) are offered a rebate of 10 to 20 per cent.

Any vessel detained after a port state control inspection, or which violates any European Commission regulation related to environmental protection, or is in laid up condition during the calendar year, will not be eligible.

There are over 1,000 ocean going vessels under the Cyprus flag, with a total gross tonnage of over 24m.

The principal purpose of the Green Incentives Programme is to "show our commitment to the green transformation of the sector," Mr Demetriades says.

Cyprus does not necessarily expect the programme to be a compelling reason in itself for ships to join the Cyprus flag, since reducing emissions beyond what is required will probably cost them money.

"As a maritime administration and as a maritime nation, we thought at this stage to come up with green incentives to give the message we are here to reward the shipowners that accelerate any investment on green transformation."

"The decarbonisation path will not happen overnight. It needs a basket of measures, starting with development of cleaner fuels, energy efficient technologies, optimisation of ports and logistics, the use of digital technologies. There is a role for everybody in this decarbonisation path."

"The reward is addressed to those that go beyond the existing regulatory framework, to early movers, innovative approaches.

"It is a live document, it could be amended."

Cyprus is the second EU member state that provides these kinds of incentives, he says, the first is Portugal.

The reason that LNG fuelled ships are not covered is that "the whole idea of the incentives is to address decarbonisation," he says.

"Our national position is to signal that LNG should continue to be supported and funded by the EU as an alternative fuel."

Cyprus as a nation has interest in developing natural gas reserves around Cyprus, which could potentially be useful for marine fuel. "This is something we are exploring as the Cyprus government."

Emission trading scheme

The European Union has signalled that it wants shipping to be covered by the Emission Trading Scheme, which also applies to heavy shore based industries in Europe, and to aviation.

It means that companies which emit CO2 have to pay for a sort of license to do it. Some of these licenses are given out free to emitting companies. They are traded at a price set by the market.

This is a very contentious issue in the shipping industry, where there are strong feelings that as a global industry, it needs global regulation, and any non-global rules add to the complexity.

But the reality is that the European Union wants to decarbonise faster than many other parts of the world, Mr Demetriades says. And nobody in the shipping industry, or even Cyprus itself, has power to stop this from happening.

For the maritime industry, "it is important not just to stick to the initial statement 'shipping is global' but to make this European emissions trading system workable to the greatest possible extent," he said.

Cyprus can make a useful contribution by "signalling to Brussels the realities of the sector, and its need for certainty."

"It is important [for us] to convey that message that we want to speak to the other side, breach the gap between the greens and the shipping world. Only when we bridge that gap, we are able to have a proposal that will serve the purpose and will not damage the global shipping industry."

"We change a bit the way we brand shipping, we negotiate and we signal."

The IMO has actually made a lot of progress on the issue, although you need to bear in mind that progress is very complex, with so many more different parties involved in the discussions, he said.

The EU move follows legislation to bring aviation into the Emission Trading Scheme. But the policy makers need to understand that shipping is a very different industry, Mr Demetriades says. "There are many [more] players. Shipowners, charterers, ports."

"We are saying, [the EU] should clearly specify the geographical scope, clearly define each entity's obligation."

The EU could ensure that any money paid for emission credits should then be spent on research and development of alternative fuels for shipping, and that shipping companies can trade credits with each other, he said.

Any scheme should be designed to be flexible, so it can be merged or aligned with any measure which IMO might introduce in future, he said.

"Cyprus will always be signalling how the shipping industry works, what are the dos and don'ts."

"We need to strike a balance between maintaining the competitiveness of shipping and having a meaningful contribution to climate change."

It is not yet determined in Brussels whether the emission trading scheme will apply only to short sea shipping within Europe, or international shipping. "We are all waiting for the proposal from Brussels, how it will be formulated," he said.

The Cyprus government organised a webinar in December 2020 to contribute to the Commission's public consultation, with involvement of shipowners, European Parliament members, and other organisations.

TO

Interview with Synergy's Rajesh Unni

Captain Rajesh Unni, CEO and founder of Synergy Group, told Tanker Operator about his company's experiences with COVID-19, support for seafarer mental health, digitalisation, decarbonisation and challenges for 2021

Captain Rajesh Unni, CEO and founder of Synergy Group, talked to Tanker Operator about his company's experiences with COVID-19, support for seafarer mental health and welfare, digitalisation, decarbonisation and where he sees the biggest challenges for 2021.

This article is based on Captain Unni's replies to our questions.

Synergy has 360 vessels in its fleet as of March 2021, including over 160 tankers, also bulk carriers, 20,000TEU container ships and LNG-FSU conversions.

The 160 tankers include VLGCs, LNG tankers, VLCCs, chemical tankers and smaller oil tankers such as Suezmax, Aframax, LR2, LR1 and MRs.

COVID

The COVID crisis has affected everyone in shipping and continues to do so.

It has been – and still is to varying degrees - a humanitarian crisis, an operational crisis and a mental health crisis.

How have we coped? We have done our utmost for seafarers and ship owners, but it has been a year of juggling constantly changing local and national rules and dynamics from day to day and port to port.

Things have now settled down somewhat, meaning we are able to make more crew changes than we could six months ago, and we have vaccines being rolled out and that is helping.

Synergy Group is a founding member of the Global Maritime Forum's taskforce that led to the Neptune Declaration and this is also now bringing more pressure to bear to improve things. But, of course, we need more progress. The situation is still a long way from perfect.

It is seafarers who have borne the real brunt of COVID and shipping must ensure this can never happen again.

We need to have a voice with governments, and we need recognition that seafarers are key workers.

We need to speak up more about shipping's importance to global trade but also to global wellbeing.

This has been clear in the response to the pandemic. The raw materials, the energy, the consumer goods, the PPE, the vaccines, the medicines and the food that people rely on have

been delivered by ships without interruption throughout this crisis.

This pandemic is not a black swan event. We should plan for the next one now so we can avoid repeating our mistakes.

Seafarer mental health

I think it is clear in any profession that if you take away the basics of human dignity and the means of maintaining personal morale that you're not going to get a better, or safer, working environment.

Imagine what impact the last year has had on seafarers and their mental health, with so many confined to ships for so long despite all our best efforts.

Synergy's seafarers have been fantastic throughout and Synergy has maintained safety levels. But is forcing people to stay onboard ships in a confined and often hazardous environment a good way to ensure the safest possible industry? Of course not.

Seafarer wellness has to be a priority. It was something we were looking at long before we'd heard of COVID.

iCALL is the helpline we established in 2018. It is professionally staffed by counsellors 24/7 and available to all in shipping in multiple languages. It certainly has seen heavy use these past 12 months.

More generally I think shipping as an industry should look to the rest of society and see that we have a lot to learn about how we approach the mental health and wellness of our employees.

We will be placing a lot of emphasis on leadership throughout the organisation in 2021. To ensure our operational resilience is shock proof and our staff have everything they need to ensure their physical and mental wellbeing.

OCIMF human factors

We welcome the [human factors] initiative by OCIMF in bringing such a detailed approach to the human aspects of maritime activities.

Despite considerable improvements in systems approaches, the fundamental attribution error, where an individual's behaviour is overemphasized for failures, is still prevalent in shipping.

We are engaging with human factors specialists in multiple areas and we are confident that appreciable changes will be evident in the short, medium and long term in full alignment with the intent of OCIMF.

Digital technology

Covid has most definitely accelerated digital adoption.

I think that whatever the profession, we've all seen that technology can improve productivity and efficiency when applied correctly.

We plan that more of our fleet will be fitted with [Synergy subsidiary company] Alpha Ori's

Captain Rajesh Unni, CEO and founder of Synergy Group

SMARTShip Internet of Things platform, which reduces GHG emissions in accordance with IMO targets and provides all stakeholders with live transparency via thousands of data points.

We have now installed SMARTShip on over 100 ships with another 150 in the pipeline. A lot of interest has come during lockdowns when people have been inspired to look at the world in new ways.

This includes the Saudi Arabian national carrier Bahri. We've signed a strategic partnership agreement with the ship management division of the company which includes the installation of Alpha Ori's SMARTShip digital platform across a substantial part of the Bahri fleet.

We expect more uptake this year.

Decarbonisation

I think it is clear we all need to play our part in meeting the UN's Sustainable Development Goals.

The IMO has been very clear about how we as an industry can play our part in reducing emissions and we fully agree with those aims and will be pursuing them with vigour.

Eventually this means using alternative fuels, but in the here and now there is a lot we can do to cut emissions.

More efficient ship management is something we specialise in, so stricter rules are not problematic.

This is one reason why we are digitalizing to make vessel and fleet operational efficiency and fuel-saving gains through SMARTShip.

We are also studying and implementing a range of ship design and operational steps to save energy, because saving energy is the first step to cutting emissions.

This is the concept of the NegaWatt. Not using energy is the easiest means of cutting emissions.

More immediately, we are looking at the IMO's Energy Efficiency Existing Ship Index (EEXI) and Carbon Intensity Indicator (CII) which represents the next step in IMO's initial GHG strategy.

The age of parts of the tanker fleet means that, in many cases, vessels may struggle to meet the required EEXI and CII criteria. So we are exploring currently with classification societies, owners and other stakeholders how we can best help them comply in time for the rules entering into force.

We see ourselves as a technical thought partner to our customers and we see decarbonization as a joint responsibility. We're investing a lot of resources to ensure we can help lead this inevitable transformation of shipping.

Biggest challenges for 2021

The burden of the coronavirus pandemic was felt most heavily by those on the front line providing healthcare and essential services, including seafarers.

But Covid fatigue spared nobody. In 2021 we need to really focus on our people.

So, I think for any shipping CEO looking at challenges this year [2021] addressing that fatigue element and the mental strains of working from home and lockdowns has to be at the forefront of your mind.

We have found new ways of operating safely and technology has played a big part in how we have all coped, but I think this will prove to be only the start of the journey.

How we work will never quite be the same again so addressing what this means for our organisation as a whole will be a top priority.

Ensuring the wellness of all our personnel – and especially our crew - after such a torrid year will be the priority.

We will also be placing a lot of emphasis on leadership throughout the organisation in 2021 to ensure our operational resilience is shock proof.

Covid has also highlighted that collaboration – with customers and competitors – produces better results.

For example, the alliance which we formed with an array of shipping companies to push for crew change solutions last year showcased that collaboration between CEOs can yield immediate benefits.

So in 2021 Synergy will pursue more collaboration with those that share our progressive core values. Not only in relation to the crew change crisis, but also in addressing other emerging issues in ways that unlock multi-stakeholder benefits.

The major strategic takeaway from 2020 is that, more than ever, it is clear a successful business must have a coherent long-term plan but remain flexible enough to adapt to short-term challenges.

Predicting events such as pandemics is impossible, but you can strategize in a way that minimises risk and maximises resilience.

TO

Seafarer mental health – from a management perspective

While we all care about seafarer mental health, working out how to tackle it from a management perspective is another challenge. Charles Watkins from Mental Health Support Solutions in Hamburg shared some ideas

We all understand seafarer mental health is important, but working out how shipping companies should tackle it as part of the management of their business is another issue.

We spoke to Charles Watkins, managing director of Mental Health Support Solutions in Hamburg, which provides maritime specific support, about how he thinks tanker company management should handle the issue.

For shipping companies, mental health issues can be seen as a T shape – there are a broad range of issues relating to the general culture, which affect just about everybody, and then there's the deep traumatic issues which may occur after a specific event.

One of the most useful things shipping companies can do is keep in regular contact with vessels to have a conversation specifically about mental health issues, he says.

Charles Watkins, managing director of Mental Health Support Solutions in Hamburg

"We all have struggles in our life it is part of the shared human experience. We all suffer from cases of anxiety, depressive episodes."

Companies can hang up posters on ships, giving out the message that nearly everybody needs help at some point in their lives, it is OK not to be OK, it is OK to ask for support.

Companies can also make it easier for seafarers to talk to someone, he says. It can be a similar process to encouraging seafarers to speak up when they see something unsafe.

Mental health can go together with supporting seafarers' physical health, in supporting them in having a healthy diet and being able to exercise, he says. "They all go together."

MHSS staff spend time onboard vessels and offshore platforms. "We get to know the life of the seafarer. How it is to sleep there, live there, eat there, at least to a point where we can kind of understand where they are coming from."

"We understand the environment, the everyday walk to work and back, the social room, the things they say are important."

"We talk to them on the vessel, we get a lot of feedback."

The practice is based in Hamburg, but has associate consultants around the world.

Bullying

One of the biggest causes of poor mental health, which is not given much attention, is harassment and bullying, which is widespread in some parts of the maritime industry, Mr Watkins says.

"We find out more and more, this is a very normal thing that happens, a thing that's constantly happening. It's very sad to find that out, so many people told us. They suffer silently as they move through the ranks."

"Yesterday we had a webinar, a lot of seafarers talked about that issue."

Posters can be displayed onboard ships, giving out the message that nearly everybody needs help at some point in their lives

"That really destroys motivation, really decreases the focus and concentration when you're trying to work."

"You go with this culture of bullying and harassment, you don't think about it, you kind of endure it."

"No-one should suffer because they are being bullied and harassed through their entire contract, that's horrible."

These behaviours can be embedded in maritime cultures, which have been around as long as there has been a shipping industry.

It is not usually possible to force any culture to change, but you can "allow the culture to change itself if you can accept the right impulses," to see what is right and what isn't, to say, we're not going to take this anymore," he says.

When seafarers "realize this is something they can actively influence, they don't feel

helpless."

"They are strengthening themselves, their ability to change their environment. That's when things change, that's when people start allowing themselves to believe that change can happen."

"It is a learning process. It is also a process of slowly adopting a healthier communications strategy."

"It is a difficult challenge, someone has to do it, we need to start that process."

Trauma

Sadly, traumatic events can happen at any time on vessels.

"We often go to vessels after something has happened and administer psychological first aid," he says.

This can involve looking for symptoms of post-traumatic stress.

"Sometimes it can take time until symptoms come up, there's a delayed affect."

The company makes what it calls a "Mental Health First Aid Kit", with support ideas for people who are not professionals, which they can apply in the event of a trauma.

It is possible that a crewmember could be given basic training, in the same way as people have first aid training. This person "knows the basics, who is able to implement certain strategies before we [as professional support] get there."

This person could offer emotional support, listening when people talk things through. This person could also recognize people in distress, or otherwise make sure people are fit for duty. It would be a role suitable for "people who are naturally good at communicating," he said. They could even have a title like "mental health officer".

Helpline

One of the services MHSS offers to shipping companies is a 24 hour helpline, where seafarers are able to talk to trained psychologists in their own language about any concerns they might have.

The calls are answered by MHSS associates, all trained psychologists, based in countries including India, China, Singapore, Philippines, Russia, Ukraine, South America, and UK.

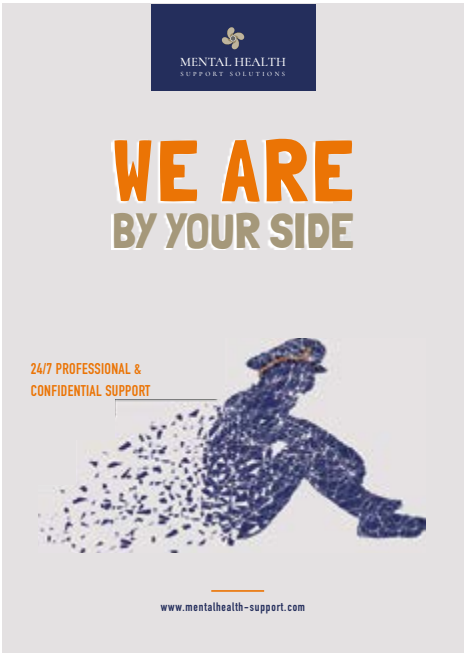
Just having the service available "gives them ease of mind, even if they don't use it right away. It is there if they do need help. It gives them the option to debrief, to decompress," Mr Watkins says.

"They appreciate the company taking care of them, in an aspect that is very important but maybe not often talked about. It makes mental health seem less of a taboo subject."

People do not need to give their name or the name of the vessel. They can be provided with mental health tips, or a counsellor can talk through their feelings and normalize feelings of anxiety or frustration.

Seafarers can be asked what would make them feel better. They can be encouraged to speak to family and friends, and also consider if there is someone who has helped them in the past, in a relationship which can be reactivated.

Seafarers might be encouraged to connect more with people onboard. Sometimes the availability of internet communication can discourage people onboard from talking to each other. The counselling can re-emphasise the value of face to face communication, he says.



A poster MHSS provides for ships

While the company may not be able to do much when crew are unable to leave a vessel, the counselling service can help. "It is about having the possibility to talk about these things – the anger, sadness, depression, having the ability to get it all out," Mr Watkins says.

Some companies using the service have already seen a decrease in accidents, he says. Other companies have directly made returns through being able to avoid diverting the ship to enable a mentally unwell seafarer to go home. The service has also helped resolve conflicts between crew members which threatened to escalate.

"The feedback we get from seafarers that use our services, they really appreciate the fact that this is there for them."

"Not everyone will say they need it or think it is relevant. They say it is good for the people who need it."

Other services

The company also offers online mental health screening tests suitable for seafarers. These tests ask questions which help evaluate if somebody suffers from depression.

If something 'jumps out' in the survey, "we contact the seafarer to see what exactly is going on, how do we solve this problem, is he really ready to go out to sea," he says.

MHSS also provides leadership coaching, to masters and officers, which may be particularly appropriate if there are problem signs. TO

OTG's new platform for seafarer training

Ocean Technologies Group, including Videotel, Seagull and others, has consolidated its offering onto a single platform to make it easier for shipping companies

Ocean Technologies Group (OTG), the maritime e-learning company formed by the merger of Videotel, Seagull, COEX, Marine Training Services (MTS), Marlins and Tero Marine, has combined all of its offerings on a single platform, under the new company name, Ocean Technologies Group.

The merger follows the companies coming under the common ownership of Oakley Capital, based in London.

Having a single platform should make it easier for shipping companies to work with the products of the various companies, and also support the further development of maritime e-learning.

Manish Singh, CEO of OTG, and a third generation seafarer, said that the platform has a "totally revamped user interface, immersive new content and improved engagement tools."

By bringing the courses together into one platform, it can become a "performance tool", more than just a "learning tool", Captain Singh said.

The new motto of the company is "performance beyond compliance", or in other words, it is good if we can focus on improving performance, not just complying with the rules.

The company has transformed the ability to configure a training program across the company, Captain Singh says. You can specify certain courses for the entire company to do, or for crew on a specific vessel, or a specific type of vessel, or for crew in a certain rank, or for crew working on ship fitted with a certain piece of equipment.

A company may want crew to take certain courses in preparation for an audit, or to help familiarise them with a vessel before joining it for the first time.

Seafarers can be assigned a group of courses, and they can monitor their progress through them. This can link to the company's "competency management system," showing what proficiencies everyone has achieved. Seafarers can also set long term personal development goals and monitor progress towards them.

You can also incorporate home-built courses specific to your company or a ship into the system, and also courses from other organisations, such as original equipment manufacturers (OEMs), classification societies and flag states. The software has APIs which should enable it to integrate with other software systems.

Realistic scenarios can help training evolve from sharing knowledge to supporting competency development (Injured seafarers are played by actors)

OTG has a "dedicated service team" which will work with shipping companies to co-ordinate how they use OTG materials across their fleets.

Support in difficult times

"I saw 2020 as the most operationally challenged year the maritime industry has faced in living memory," Captain Singh said.

"An unprecedented mental health crisis [plus] reduced availability of seafarers' time, makes assessment, learning, and retention more difficult than ever.

With this in mind, the systems have been designed to help people do more learning in less time. "This is incredibly important in the busy environment we find ourselves in," he said.

Seafarers can do learning and assessment on multiple devices.

When they are brought to do classroom or physical training, that precious time can be spent on "mission related training," something specific to the task in hand.

OTG is also offering free wellbeing training for seafarers with online tools.

The platform

The platform was designed with a "seafarer first philosophy", making it simple for people to find what they are looking for, and making it work on any device, says Casper Atkinson, chief product officer with OTG.

Mr Atkinson joined OTG six months ago (September 2020). He has a background in digital product development for online content and streaming.

The platform provides additional opportunities to communicate with seafarers. The shipping company can send updates about critical training, send company bulletins, and monitor whether seafarers have opened the messages. They can also send questionnaires or polls to seafarers and shore based teams.

The user interface design has "borrowed heavily from well-established contemporary interfaces," with effort made to reduce the number of clicks needed, and make the most important material easiest to access, he said.

The learning modules appear in "trays", with the most important learning in the top tray, scheduled / required learning (with a due date) in the second tray, another tray for "continued training" (training which has ben started but not completed). There is a tray

of "updates" – new training developed on specific topics, for example container fires and handling volatile organic compounds.

When you click on the training you see a summary page, with details, a summary and chapters, and then you click on a chapter and the training starts.

All of the courses have been "re-authored" to make them work well on mobile devices.

OTG has "by far the most extensive content library in the maritime world," with over 800 titles, developed over the many years that Videotel and Seagull have been active, Mr Atkinson says. Many of these have flag state approval.All of the courses can be provided directly over the internet if a connection is available. Alternatively, they can be provided onboard vessels on a piece of hardware called the "Ocean Box". There are also ways to download content onto mobile devices for offline use.

As communications bandwidth becomes more widely available, the company is aiming to transition to much more digital delivery allowing for non-hardware dependent on-demand updates.

Knowledge or competence?

OTG is keen to move further in the direction of helping seafarers develop competence.

Until now, e-learning has mainly been about sharing knowledge and information, with videos or online guides, then giving them a knowledge test.

The next level to building competency is helping seafarers improve situation awareness and skills. This can be done digitally with simulations.

"We can put seafarers into a situation you would not want them to be in, in real life," Mr Atkinson says.

"They can acquire key skills on how to cope in stressful situations - through demonstration and repetition."

Mr Atkinson showed an example online training course made with five actors. The actors played seafarers who had been injured in an explosion, perhaps in an engine room, with fake blood gushing from one actor's leg. The viewer was invited to play the role of a chief officer, entering the engine room, needing to decide what to do in the situation, to avoid lives being lost, taking into account what was known and not known.

"You are the first on scene, you must make decisions for first aid to ensure everyone survives. You will be scored on the accuracy of your decisions and the time it takes you to make them," Mr Atkinson said.

There isn't necessary one correct pathway, but some pathways lead to better outcomes

than others.

"We take learning from a passive to an active experience. And the end user wants to improve the outcome," he says.

The software can also support role playing games, such as for collision avoidance, where the user can work through a range of simulated scenarios.

Other training services

OTG is offering a virtual classroom (similar to a Zoom meeting). It can support private classrooms with instructors, or webinars for up to 500 people. There are tools for polling, chat, screensharing, white boards.

The classroom is integrated into the Ocean platform. You can schedule events through the communications system, and select invitees from the user database.

Everything runs from a PC or mobile browser, no additional software is required. It should be ideal for companies who want to move their normal face to face training online.

OTG is also developing a remote assessment centre, to replace the physical seafarer assessment centres, if people are unable to attend them due to Covid concerns.

Supporting customers

To make invoicing easier for customers, OTG is re-organising its contracting, so customers pay a single invoice for their whole fleet for all OTG products. All invoicing will now be in US$.

Individual seafarers can also take out courses on a pay as you go basis.

OTG has a data analytics team with a remit to find insights into how its customers can improve their training across the company. The team's job "is to help us understand our information better, so we can help customers deliver on their KPIS," says Johan Gustafsson, Chief Revenue Officer, OTG.

They will be able to alert customers to trends in the data they may be interested in. "We'll be able to provide insight at a much higher level than before," he says.

The company also has a customer focus team helping existing brand customers move onto the new consolidated platform.

Wallem

In January 2021, ship manager Wallem Group announced that it had signed an agreement with OTG to implement the OCEAN Learning Platform, providing access to its 7,000 seafarers.

"We want to make sure training and development of our seafarers do not take a back seat in this time of increased demand and change. We need tools to accelerate the time-to-competence for our seafarers," said John-Kaare Aune, interim CEO, Wallem Group.

"The OCEAN Learning Platform enables us to proactively close training gaps and increase training effectiveness, which in return will strengthen our safety culture," said Yvette de Klerk, Head of Training, Ship Management, Wallem Group. "The trainers at Wallem will benefit from the automated processes, training data analysis and ability to track crew achievements online."

Click what you want to do next

IUMI – how tanker insurance is changing

The International Union of Marine Insurance (IUMI) provided an update on issues affecting marine insurance in new ways over 2020, with some elements specific to tankers, discussing changes to tanker usage affecting risks, cybersecurity, climate change related risks, and port risks

The International Union of Marine Insurance (IUMI) provided an update on trends in marine risks and insurance over 2020, many of which relate to tankers.

Covid drove many changes in risk patterns over 2020. Most will be short term anomalies. The challenge is working out which of them may be permanent changes, said Phil Graham, chair of IUMI's facts and figures committee, and head of marine with Chaucer, an insurance underwriting group.

In the cruise sector, Covid led to big changes in how vessels are operated, with vessels in lay-up having a very different loss and risk profile, he said.

In the tanker sector, many vessels saw a change in use from transporting oil to storing oil, through a combination of COVID, and changes in oil supply. This changes the risk patterns, he said.

The consequent low oil price caused changes in people's navigation patterns. For example, in some cases it was more cost efficient for vessels to go around the Cape of Good Hope (South Africa), rather than go through the Suez Canal and pay canal fees. That changes the risk profile.

In 2020 there was huge volatility in tanker charter rates for various reasons, which had ramifications in the insurance industry, in particular on the valuations of vessels for insurance purposes. "Earnings sky rocketed, sank, skyrocketed, sank," he said.

Phil Graham, chair of IUMI's facts and figures committee

Another issue is the war insurance premiums, with piracy attacks and other war risks, particularly East Africa and the Middle

East. "That has undoubtedly affected tanker operations," he said. "There's been some noteworthy attacks, and responses from the insurance market in premiums."

On the technology side, insurers are increasingly working with "relational data" and analytics about how vessels are being operated in order to assess risks, rather than just looking at the vessel's physical characteristics. Two companies supplying such data to the insurance sector are Concirrus and Windward, he said.

Climate change

Marine insurers are increasingly looking at climate change, in terms of how it changes the risks of operating vessels.

We may already be seeing the impact of climate change in the number of containers which fall off ships, said Isobel Therrien, chairperson of IUMI's cargo committee.

Typically 1400 containers are lost a year at sea, but in the first 6 weeks of 2021, already 2500 containers had been lost, Ms Therrien said.

It may be possible to fix the problem with a more robust method of attaching containers to ships. The current system, with "turn buckles" connecting one box to the box above, and "lashing rods" connecting a container to the deck of a ship, may not be strong enough for a tower of containers 10-12 high, she said.

"There's all sorts of forces that create a momentum on this stack of containers. That momentum can cause containers to fall overboard or collapse on themselves."

Climate change is "already impacting on frequency and severity of claims," she said, such as from wind storms and coastal flooding.

Climate change also affects risks in another way, because of low carbon fuels which companies are adopting, which bring different risks with them, she said. A move "to implement strict sustainability policies is likely to change the risk environment."

"The marine insurance sector is , if anything, disproportionately affected by climate issues, wind storms, storm surge, tsunamis, rise in sea levels," said Richard Turner, IUMI president.

Some individual insurance companies are also signing up to Environmental / Social / Governance (ESG) initiatives, perhaps with the encouragement of their own investors.

Isobel Therrien, chairperson of IUMI's cargo committee

Lars Lange, secretary general of IUMI

"The IUMI membership agreed IUMI should be more active and work to raise awareness of issues," said Anneke Kooiman, an executive committee member with a focus on ESG issues.

Cybersecurity

Cybersecurity is "an enormous question" for marine insurers, said Philip Graham, chair of IUMI's facts and figures committee.

The insurance market is "developing some bespoke solutions to marine cyber security," he said.

Everybody is aware of the attacks on Maersk Line, and the hack on CMA CGM is also widely known, even though both these attacks were on information systems used for container bookings, which are very different and arguably far more business critical than the software used by tanker operators for managing vessels.

Lars Lange, secretary general of IUMI, notes that cybersecurity is a "moving target that is permanently developing."

"We've seen in the past a number of exclusion classes," he said. (An 'exclusion' is where the insurance policy states that it will not pay if a certain risk occurs).

"This may change once we have understood what this is about. We may see some insurance solutions."

"It does impact on the claims side. And not necessarily every cyber claim is reported as a cyber claim to the insurance industry."

IUMI was involved in putting together BIMCO's "Guidelines on Cyber Security Onboard Ships", as one of a number of core authors, with a particular involvement in a chapter on insurance.

There is perhaps still an open question of how big a concern cybersecurity actually is. IUMI issues a "Global Maritime Issues Monitor" every year, in collaboration with insurers Marsh and Global Maritime Forum, based on a survey of shipowners and shippers around the world, to ask what they perceive as the biggest risks.

In the 2020 report, cyber attacks were ranked by respondents as 9th in issues in terms of potential impact, and 5th in terms of the likelihood of it happening, Mr Graham said.

Companies are ranking it lower in impact and likelihood than issues like the global economic situation, environmental regulation, geopolitical tensions, and "things like AI".

Ports

Less relevant to tanker insurance, but perhaps of peripheral relevance, is that the insurance sector is paying more attention to risks at ports and terminals.

There have been two major port explosions in recent years. There was a series of explosions at Port of Tianjin, China, in August 2015, where 173 people were killed and hundreds injured, at a container storage station. It was initially due to an overheated container of dry nitrocellulose. One explosion involved the detonation of about 800 tonnes of ammonium nitrate (approx. 256 tonnes TNT equivalent).

In August 2020, there was a big port explosion in Beirut, due to the ignition of ammonia nitrate which was being stored at the port. This caused 204 deaths and 7500 injuries.

The insurance industry is urging terminal operators to pay attention to how they manage storage of dangerous goods, Ms Therrien said.

Another trend in 2020 was the growth in the "social justice movement", such as the Black Lives Matter protests, with civil unrest targeting some retail locations in cities. There are concerns this could extend to ports, she said.

Marine insurers arrange SRC (Safety, Rehabilitation and Compensation) Coverage, which can cover loss or damage by strikers, riots of various kinds. In the marine world, this can cover riots at ports.

TO

ICS webinar – what are the cybersecurity risks?

An ICS maritime cybersecurity webinar discussed the importance of managing cybersecurity the same as we manage other maritime risks, the problems of insurers excluding cyber risks, and what the biggest risks actually are

A webinar on maritime cybersecurity organised by the International Chamber of Shipping (ICS) on Feb 10 discussed the importance of seeing cybersecurity as a risk management problem rather than a threat, the problem of insurance companies excluding cover, the role of people in preventing or causing attacks, and what the risk actually is.

Espen Poulsson, chair of ICS, said in his introduction that cybersecurity is relatively new to the industry, although many people know about the attacks on Maersk and CMA CGM, and have become worried about it.

Screenshot from the ICS cybersecurity webinar.

Top row: Päivi Brunou, Head, Cyber Security, Wärtsilä Voyage; Chronis Kapalidis, Associate, International Security Department, Chatham House; Phillip Morgan, Professor of Human Factors and Cognitive Science, Cardiff University.

Bottom row: Julian Clark, global senior partner, Ince and Co; Esben Poulsson, Chair, International Chamber of Shipping

Chronis Kapalidis

Cybersecurity expert Chronis Kapalidis said that many people struggle at the first step, understanding what cybersecurity actually is.

He suggested this working definition, "cybersecurity is the implementation of specific technologies, procedures and controls in order to protect information, data and infrastructure that is based on computer enabled devices or software enabled devices, from any external threats.

This can include technology both in the office and onboard the ship, if it has a software component and is vulnerable to a cyber incident.

Mr Kapalidis is an Associate at the International Security Department with UK think tank Chatham House, and a former naval officer with the Hellenic Navy. He is also a senior advisor to cybersecurity company HudsonAnalytix.

When hacks happen, Mr Kapalidis prefers the term 'cyber incident' to 'cyber attack', because, he says, people can adopt an unhelpfully defensive approach when they hear about an attack.

It can be more useful to spend time putting processes in place which provide protection, rather than trying specifically to stop attacks, he said.

This means that instead of talking about cybersecurity, we should be talking about cyber risk and cyber risk assessment, he said.

The maritime industry is comfortable discussing risks, but it is not very comfortable discussing security, he said.

The IMO regulation introduced in January 2021 also says that shipping companies should address "cyber risks", not "cybersecurity", he said.

The risks should be addressed within safety management systems, so part of the ISM code.

"Cyber security is a risk that has existed [for a while] but it has escalated. It is another risk shipowners need to address."

The IMO approach is based on the NIST (US National Institute of Standards and Technology) cybersecurity framework, built around five steps of detect, protect, identify, recover, respond. It can be applied to any sort of cyber incident, he said.

"It is not something new," he said. "There's frameworks out there that shipping companies can turn to, to understand what they should do in order to meet that regulation. We are seeing that the industry has taken significant steps on that."

"Shipping companies just need to identify what they should do for their specific operational environment, and to protect the organisation."

Mr Kapalidis recommends the BIMCO "Guidelines on Cyber Security Onboard Ships," now in its 4th edition, and being updated with much input from the industry.

Past attacks

The cyberattack on Maersk "was collateral damage of an attack of a sovereign state against another," he said. The malware involved, NotPetya, is thought to have been released by a Russian government body with the aim of damaging Ukraine.

In 2010, a Greek shipping company, which had suffered some of the worst piracy attacks off Somalia, discovered that the pirates had paid hackers to get access to the shipping company's infrastructure. This enabled them to identify when the ship would be in the most vulnerable situation, so the best time to launch an attack, he said.

The hacker gained access from using an "IOT search engine" to look up internet enabled devices in the shipping company's office. Then the hacker found that they had not changed their default user name and password on some of them.

Risk assessment

The most important issue for shipping companies is to understand where their cyber vulnerabilities are, and how they should be protected.

Many risk assessment methods, such as penetration testing, only tell you where you are at a specific point in time. So it is important to look at cybersecurity not just as a one-off task, but as an ongoing risk management exercise, he said.

A "maturity model" approach can be useful, showing you how your organisation is evolving over time. "That assesses the entire exposure of the organisation, including technological elements, as you progress and improve things. It is a process, it is not a checklist."

"We know the attacker will be one step ahead of the defence, we need to minimise that gap as much as possible."

Regulation

Mr Kapalidis said there is an open question about whether maritime cybersecurity needs more drive

from regulators.

In surveys done by HudsonAnalytix, European participants, who are mainly Greek, say that IMO should do more regulation. But Mr Kapalidis said he does not believe IMO will choose to go further than it has done so far, making initial guidelines.

Asian participants in the workshops typically say that the drive to improve cybersecurity standards should come from more classification societies and P+I clubs.

Insurance challenges

Many marine insurance companies are limiting their cover of cybersecurity risks, due to concerns that the costs of a cyber attack could be extremely large, said Julian Clark, global senior partner maritime at law firm Ince & Co.

"A number of leading underwriters have said they don't think the amount of coverage available is sufficient to meet the risk," he said.

As a result, many P+I clubs have adopted a clause "LMA 5403", which limits the extent of insurance cover they provide for cyber risks.

"We've seen a number of clubs put up warnings on websites saying that in the event of any claim resulting from a cyber breach, where it is determined the member did not have a cyber resilience program in place, cover can be compromised. That's a really important message for the industry."

But this leaves a gap in cover, which worries other organisations with a stake in maritime risks, such as the US Coastguard and oil company charterers, he says.

Perhaps as a result, the US Coastguard has said it will take a very strict interpretation of the [IMO cyber risk management] rules. This could extend to detaining vessels if they think there has been a breach (a successful hack), or if they are not happy with the cyber risk management. "We see the same from oil majors and Inspectorates."

"We need to come together to create a standard of cyber protection where underwriters and members can be assured, in the case of a cyber incident, they have adequate insurance coverage."

An insurance underwriter might also argue that a ship which has been successfully hacked is "unseaworthy", leading to a discussion about whether the ship owner took due diligence, he said.

But if the hack pathway was something in the ship when it was built, for example a flaw in the ship's electronics, then there is a question of whether that falls "within the owner's scope of due diligence."

Another scenario is if a cyber incident leads to a grounding or collision, but the insurer claims limited liability for cyber related issues. "I think there's some huge issues here for the industry to cope with," he said.

The fact that cyber incidents seem to be rising is increasing insurers' concern. There have been reports of increases in phishing attacks on employees during the pandemic, and an increase in operational technology (OT) related attacks (although not specifically in ship operations), he said.

Mr Clark believes that shipping companies have got quite good at protecting IT infrastructure, but that may mean that hackers look harder to attack ships via devices, or "operational technology".

That could be compared to someone who puts strong security systems on their house front door, but makes it easy to get into the house through the garage, he said.

Mr Clark agreed with comments from Mr Kapalidis, that we should adopt a risk management approach. "We need to get away from a tick box approach to [cyber] compliance," he said. "You need a resilience policy that ensures you're constantly on top of and reviewing the exposure to the organisation."

How people fit in

People are sometimes blamed too quickly for cyber security incidents, said Phillip Morgan, professor in human factors and cognitive science at the School of Psychology at Cardiff University.

But evidence increasingly shows it is more likely that people are the strongest link in the cybersecurity chain, spotting incidents quickly which bypass the digital cyber defences, he said.

Mr Morgan serves as technical lead for the Cyber Psychology and Human Factors Pillar for the Airbus Centre of Excellence in Cyber Security Analytics at Cardiff University.

"Some suggest [people] are irrational, gullible, sometimes we hear the word stupid."

But "we are a species known to being adaptive problem solvers, who adapt strategies and create tools to succeed in the face of huge challenges."

While all cyber attacks have people involved, that does not mean that the people intended them to happen. They may be caused by "people who chose to download files, click on links, connect a device to fulfil an urgent task. People working long hours, responding to apparently urgent e-mails."

"We can't be super vigilant all the time. Under time pressure, we all do things where we think, 'I wouldn't have done that under normal circumstances.'"

"It is sadly the case that cyber criminals are attacking employees at all levels."

"Behind each cyber attempt is a human being, vigilant and adaptive,

praying on our cognitive biases. They've learned techniques that can impact biases, cause maladaptive behaviours. They've found optimal times to strike."

But, "the playing field is more level than we think. We can better understand that, teach our employees about them - so they can become better defenders."

People can be given advice about better ways to be protected when using mobile / IOT devices, and when working with sensitive and confidential data, he said.

It is good advice never to feel too comfortable you know where your vulnerabilities are – because attackers are always trying to find new ones, he said.

The human characteristics which lead to vulnerability are not necessarily those you expect.

You may expect your most risky employees are those who take more risks in other areas, or are more prone to impulsive behaviour. But research shows that vulnerability levels may be more connected to how well a company thoroughly appraises its threats. Also, whether staff members feel comfortable managing their own security (their 'self-efficacy'), and the level of connection people have with the devices they use.

Mr Morgan cautioned against relying too much on surveys to find out what is going on. If you really want to know what people are thinking, there are methods to see more directly. Such as monitoring people's eye movement when looking at a screen, measuring brain activity and pupil dilation. "Surveys have a place but we need to triangulate objective data with subjective data," he said.

What are the risks?

The panel was asked about what cyber incidents they had actually seen in 2020, as a means of assessing the overall risks.

Mr Kapalidis replied that many shipping companies saw denial of service attacks bringing down their websites, sometimes denying staff access to data for internal use. Some companies had compromises in their data centres.

"In our internal analysis [with consultancy HudsonAnalytix] we recognised there was a specific way these attacks were launched. The [whole] industry is using more or less the same solutions with data management and data handling."

Some shipping companies had been themselves conducting cyber attacks on competitors, trying to prevent staff from getting access to their company information, he said.

Julian Clark said he had seen an increase in Europe of companies trying to obtain personal data from company databases via phishing attacks, and then threatening to make it public unless a ransom was paid. The company would then have to choose between paying the ransom, or paying a fine for a data breach under GDPR regulations.

Mr Morgan said that companies sending phishing e-mails were getting more sophisticated, such as appearing to be a person in authority, and giving reasons why an urgent response was required. TO

This article is based on an International Chamber of Shipping webinar on Feb 10 "Cybersecurity - Safety and Security in the Digital Age." You can view it online here

https://attendee.gotowebinar.com/recording/1283112208537141 92

Thome – seafarer health and vessel performance

We asked Thome Ship Management about how it is tackling the big issues of the day in ship management – seafarer mental health and vessel performance

The Thome Group has always put the mental health and well-being of its staff at the top of its priority list, says Rajesh Divakaran, head of Marine HR, with Thome Ship Management.

Thome is based in Singapore, and manages tankers, gas carriers, bulk carriers and container ships.

Both office based and sea staff have been under increased stress due to the changes and disruptions brought about by COVID-19, he says.

Its seafarers already had access to help and support but Thome upgraded this service recently with a 24/7 free and confidential helpline service provided by the International Seafarers' Welfare and Assistance Network (ISWAN).

This has been further enhanced with Seafarer Assistance, a bespoke emotional support service operated by Swan Ltd, a subsidiary of ISWAN.

The helpline is manned by specially trained councillors, and is available to seafarers' families as well as employees.

Rajesh Divakaran, head of Marine HR, with Thome Ship Management

Seafarers onboard a Thome vessel

The company recognises the extra strain that its crews' families are enduring due to the uncertainties brought about by the virus.

The Seafarer Assistance service can be accessed using email, live chat, Facebook, and WhatsApp.

It gives Thome employees tips on how to cope with feeling low, stressed, fatigued, and helping them maximise their psychological wellbeing.

Thome implemented seafarer competitions onboard to increase engagement and help relieve the stress and anxiety of seafarers during the pandemic.

"The competitions also increased camaraderie and teamwork among the seafarers," says Mr Divakaran.

"The competitions include an art competition, video and photo challenges, a holiday photo competition, The Voice Competition.

"The competitions were very successful as many seafarers and vessels participated. Thome received good reviews and feedback," he says.

Also, to ease the burden of financial constraints, Thome provided loans and financial assistance to seafarers who are unable to go abroad due to suspended crew changes.

Thome also provided seafarers with updates on crew change updates and other related Thome News, through regular circulars, e-mails and virtual meetings.

Thome has an active "Family Relations Group" which continuously maintains contact with the families of seafarers, to reassure that their loved ones onboard are safe. "It is important to provide more support not just to the seafarers but to the seafarers' families as well," Mr Divakaran says.

Thome conducts regular webinars for seafarers in quarantine, such as TSM 'Fridates' (Friday Dates).

The event is aimed at increasing positivity and engagement during the time of

quarantine, and entertaining the seafarers with song performances, games, and a raffle.

Thome does regular monitoring of crew health, including twice daily temperature checks for all onboard crew and any third-party visitors. Crew practise physical distancing onboard and wear appropriate PPE.

To maintain awareness on COVID 19 and appropriate safety protocols during the Pandemic, Thome sends out regular e-mails, circulars, social media and other online postings.

Vessel performance

For vessel performance, Thome has taken steps in line with the short-term, midterm and long-term measures set by IMO, says Rajiv Malhotra, Technical Manager, Technical support, Thome. This is to reduce carbon intensity by 40 per cent and 70 per cent by 2030 and 2050 respectively, and total annual greenhouse gas emissions by 50 per cent by 2050.

At the operational level, there is a focus on efficient voyage management through speed optimisation, weather routing, trim optimisation, and auxiliary power optimisation both during steaming and port operations, he says.

There is periodic maintenance of hull, propeller, and fuel consumers (engines and boilers).

A team of vessel performance analysts, comprising naval architects and marine engineers, has been engaged. The company performance management system "NAU" has been significantly enhanced.

There is an emphasis on adopting additional equipment, such as mass flow meters, shaft power meters, energy meters and dataloggers, and advanced technologies for capturing and analysis of parameters.

For meeting the requirements arising from the regulations adopted in MEPC 75, it is targeted to revise the Ship Energy Efficiency Management Plan (SEEMP) to include requirements for reporting Carbon Intensity Indicators (energy efficiency operational indicator / Annual Efficiency Ratio) annually, and a corrective action plan if these do not meet required levels.

Rajiv Malhotra, Technical Manager, Technical support, Thome

The company's focus is on identifying the vessels that do not meet the IMO required EEXI levels and employing appropriate compliance alternatives, for example, Engine Power Limitation, retrofit of propulsion improvement devices like pre-swirl and post-swirl devices, propeller upgrades, and application of high-performance hull coatings.

Engine efficiency improvement potential is being explored through implementation of improved fuel component designs, engine de-rating, turbocharger upgrades and auto cut-off provisions, exhaust gas bypass, and efficient engine tuning through adoption of systems for closer fuel injection and exhaust valve control.

Variable frequency drives and energy saving lights are other features employed for contribution to fuel savings.

At the third level, from a long-term perspective, "there is an increased focus on preparing for adoption of technologies using LNG, biofuels, ammonia, batteries, electric propulsion, hydrogen fuel cells, wind," he says.

ABS – advice on operating ballast water systems

William Burroughs, Senior Principal Engineer, ABS, gives some new advice on operating ballast water systems, including regulatory extensions, challenges with shipyards, where vessel operators have most problems, training recommendations, and preparation for equipment failures

By William Burroughs, Senior Principal Engineer, ABS

The COVID-19 pandemic has not spared vessel owners from requirements to comply with national and international ballast water management regulations.

The pandemic has exacerbated the delays previously observed with retrofits.

The US Coast Guard is providing COVID-19 extensions [to installation deadlines] for vessels with no ballast water management system (BWMS) installed.

It is providing extensions for some vessels with Alternate Management Systems (AMS) accepted as BWMS which are at, or nearing the end of, the vessel's five-year AMS periods.

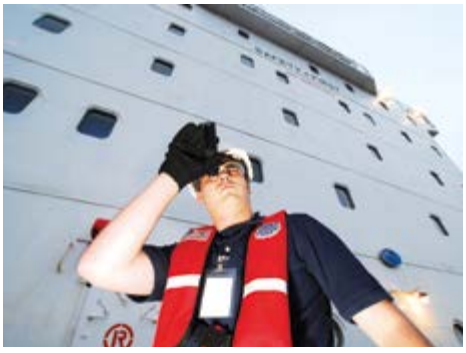
The USCG's Marine Safety Information Bulletin (MSIB) 14-20 provides 12-month extensions for vessels with compliance dates (either original or extended) between 1 April 2020 and 1 April 2021.

For some vessels with substantiation, longer extensions might be granted depending on the persistence of the pandemic.

Extensions of the AMS periods granted by the USCG could help thousands of vessels to continue operating in US waters until the pandemic subsides.

These ships, with their AMS accepted BWMS and 2008 G8 Type Approvals, are compliant with the BWM Convention.

With the short-duration AMS extensions, they could operate in US waters and internationally until the BWMS can be upgraded.



US Coastguard officials inspecting ballast water installations

Vendors and shipyards

Many BWMS vendors have 2016 G8/BWMS Code Type Approvals necessary to complete the USCG and BWMS Code approved reconfigurations.

However, some BWMS vendors continue struggling to complete either their USCG approval or BWMS Code Type Approval due to the pandemic.

The USCG's COVID-19 extensions provide an important compliance strategy until the pandemic subsides.

The bigger challenge is that some shipyards, required to observe social distancing, are being forced to limit the scope of work that can be accomplished until the pandemic is over.

This could prevent some vessels from completing their BWMS retrofits. Leading to challenges when the vessel's IOPP Renewal Survey is completed.

IMO / international

Some accommodations should be provided by Flag Administrations to support vessels struggling to get a BWMS installed on the ship. Or if it is not completed due to limited vendor technical assistance because of restrictions on international travel.

While the USCG's extension policy provides extensions for vessels affected by the pandemic, the IMO BWM Convention does not. Missing a retrofit deadline creates a noncompliance problem.

William Burroughs, Senior Principal Engineer, ABS

There is limited guidance from IMO to date on how vessels that cannot retrofit BWMS will be treated.

It is possible that IOPP Renewal Survey dates could be delayed for three months to allow some breathing space.

Views of ship operators

ABS held a series of workshops providing practical guidance and advice for Best Management Practices (BMP) with BWMS under IMO and USCG regulations, for shipowners operating installed systems

The feedback received from owners [in the workshop] demonstrated that operation of BWMS continued to be challenging.

In addition to installation issues, training, commissioning, operations and maintenance, planning for inspections, outages and the development of contingency

measures continue to be key topics.

The most recent update to the Best Management Practises included a survey of owners' experience in practice.

It found that between 2017 and 2019 - with more systems in service - the number of inoperable units fell by more than half, though the number of owners who found operations problematic doubled.

A minority of systems were not subject to monitoring or testing. A quarter were regularly operated and subject to monitoring and testing.

Training recommendations

Installation of a BWMS requires a well-planned timeline and a focus on training of the crew, ideally from before the system is installed.

Crew rotation means that [people with] sophisticated understanding can simply walk off the ship. So proper training records should include video of the installation and commissioning if possible.

For new vessels delivered with systems fitted and for those vessels already retrofitted, officers and crew must make special efforts to understand operations, maintenance and repair. Also, what to do when things go wrong, or Port State Control comes onboard.

In operation, the burden is shared between the senior officers, the crew and even shore staff.

Likely pressure from the owner to return the vessel to service puts pressure on the engineering crew to understand not just the facets of BWMS operation but its maintenance and breakdown procedures.

After installation and commissioning, technical support may disappear. This means the vessel must rely on its approved BWM Plan which itself must be updated regularly.

Crew must also understand how to produce data records, especially in US ports.

Training in sampling

Sooner or later, an inspector will want to come onboard and sample the output of the BWMS.

Guidelines (G2) to the BMW Convention provide design and installation guidance for the sampling facility.

But there remains limited training and know-how for keeping the G2 facility clean and how to obtain a sample to avoid cross-contamination that could falsely indicate non-compliance.

US Coastguard officials inspecting ballast water installations

This requires additional training for the crew.

It is advised that the crew practice for Port State Control inspections to better understand requirements they will sooner or later have to meet.

Even when the BWMS is not targeted in an inspection, they will need to understand how to prove that they can produce compliant ballast water, including sampling procedures to avoid potential false results.

It is important to recognise that different administrations could have different requirements.

So there needs to be communication with shipmanagers on sailing routes. The applicable rules in different locations should be understood by port engineers and communicated to the vessel's crews.

Testing the vessel's ability to produce compliant ballast water discharges during commissioning following installation may be the most important pre-operational validation of the readiness of the crew and vessel to meet both USCG and BWM Convention compliance.

The crew should be thoroughly trained and compliance tested often enough to reduce chances of failing a PSC testing challenge.

Equipment failures

Despite the rise in the number of systems in operation, it is important to understand what happens if the system fails and the fastest way to restore it to normal operations.

In the case of failure, the water onboard might not be considered properly treated and it may be necessary to stop cargo operations.

Interpreting alarms and alerts is critical, as well as understanding the system design limitations (SDL).

When the ballasting port's ambient water is outside the water quality suitable for treatment, the crew must be trained to know what to do next.

Ballasting rates can vary by the design of each system's computer-based controls. Cargo operations may need to be repeatedly started and stopped if BWMS repairs and resets are required.

Maintenance and spares

Maintenance intervals should be planned based on other equipment maintenance schedules. Spare parts should be acquired in the most cost-effective ways to maintain the system in operation.

The Type Approval certificate granted to the system will be valid for the lifecycle of the vessel, but the use of unverified spares or mis-repairs can invalidate the warranties.

This can be exacerbated by the likelihood that some parts will become obsolete through the vessel lifecycle.

Contingency measures

Another issue for vessel operators is the preparation of contingency measures in case the system is non-operational or fails.

Though initially optional for the BWM Convention, the USCG expects measures to be included in the BWM Plan for when something goes wrong.

These contingency measures should be practical and feasible to provide protection to the port.

The IMO's MEPC and USCG have published high level guidelines covering equipment redundancy and crew training. But in reality, vessels may need to use ballast water exchange (BWE) if they have non-compliant water onboard.

Owners using the BWMS bypass need to be aware that regaining compliance for all ballast water on the ship may become more complicated. The use of potable water is still only allowed for US compliance.

Numerous other complicated operations including transitions between light and heavy weather ballast conditions, and the potential impact on vessel air draft should also be considered. TO

Coming soon – ballast efficacy tests

New ballast water management systems will need to be subjected to "biological efficiacy tests" – basically, checking that they actually work – in addition to using type approved systems, under legislation coming into force over coming years

By Andrew Marshall, VP of Business Development, Ecochlor

The next challenge for ballast water management systems (BWMSs) will be the IMO BWMS Code requirement (BWM.2/Circ.70) for biological efficacy commissioning tests.

This is scheduled for mandatory implementation by June 2022.

As of the time of this writing, some administrations ─ Singapore, Australia, Greece and Cyprus ─ have already adopted testing on ships sailing under their Flag. It is expected more will follow prior to the date of mandatory enforcement.

The logistics and planning for the commissioning test occurs at a stage where it is often overlooked with consequences that could be quite costly.

Ballast water training

Shipowners who do not plan their installation and testing schedule properly or neglect crew training risk significant time and cost consequences.

Different to type approval testing

There is a significant difference in the purpose of type approval testing and commissioning testing.

Type approval testing demonstrates that a maker's BWMS is fit for purpose (i.e., the technology and configuration are capable of meeting the D-2 performance standards).

The purpose of commissioning testing is not to qualify or question the system's type approval certification, but to confirm that the system's treatment method is effective and properly operating in the approved installed configuration.

Commissioning testing somewhat resembles the shipboard testing that all BWMSs undergo during the IMO BWMS Code type approval process.

It requires that an approved Independent Lab (IL) board the vessel and collect ballast water samples during ballasting (voluntary) and de-ballasting.

These samples are then sent to a laboratory for analysis to determine compliance with the D-2 standard. The crew is required to operate the BWMS for the full ballasting operation.

It sounds simple enough, but when you consider the planning and logistics necessary to carry out these testing requirements it can be overwhelming in consideration of all the other projects in progress during the dry dock period.

Failed tests

In May 2020, SGS Marine Service (SGS) released a white paper that showed the results from 95 BWMS indicative and detailed biology efficacy commission tests using 14 different vendors.

The results showed "the testing was carried out smoothly, and only 3 per cent of the tests were cancelled due to complications with the BWMS operations (e.g., due to automatic shutdown)," but 21 per cent of the tests failed to meet the D-2 performance standards for a variety of reasons.

Steve Candito, Ecochlor CEO

Reducing risks

Ecochlor CEO, Steve Candito has identified a few simple ways the shipowner can significantly reduce the risk of a failed commissioning test.

First, get the approved test requirements from the vessel's flag state.

Mr Candito recommends, "owners meet with the vessel flag early in the installation planning schedule and request their latest guidance regarding commissioning tests for BWMS certification."

Obtaining this information will confirm and clarify the flag state requirements and other regulating organizations' rules.

Second, dedicate time to properly plan, schedule, and conduct the commissioning tests.

Crew-training and BWMS manufacturer equipment testing are usually the last items to

complete before the vessel leaves the shipyard, and thus are often rushed.

"Adding commissioning tests to an already congested timetable will complicate the process," he says.

Owners should aim to complete BWMS installation before the final phase of the shipyard period. This is so the commissioning tests can be conducted with sufficient time prior to the vessel's scheduled departure from the shipyard.

Shipowners are encouraged to coordinate the BWMS installation completion with the arrival of the commissioning testing team.

A seamless turnover can be beneficial considering ballast water sampling and bacteriological analyses could take four to five days, which may extend the yard period, if not accounted for in the initial schedule.

Third, ballast tanks should be cleaned prior to the BWMS installation. Contamination coming from ballast tanks, that have not been cleaned at BWMS installation, and which therefore contain significant levels of untreated silts and sediments, has led to high failure rates during testing.

"Because [cleaning tanks] is not seen as a requirement, it is frequently not prioritized because it can be laborious and expensive," he says.

The fourth and last recommendation, if allowed, is to have the manufacturer attend the commissioning testing.

Although attendance is only as an observer, the BWMS vendor can make a huge difference to address any potential issues.

"With biological efficacy tests costing $8,000 - $10,000 USD, it is likely to be both timelier and more cost effective to have the BWMS manufacturer available as an additional level of support," he says.

Extensions

It is important to note that in the event of a failed commissioning test for any number of reasons, shipowners may apply for a short-term (usually 3 month) extension.

Extensions are approved on a case-by-case basis by the flag administration to allow the vessel more time to complete testing requirements.

Typically, the extension calls for the classification society to follow through in completing as much of the requirements as possible for issuance of the International Ballast Water Management Certificate (IBWMC).

Incomplete testing will result in an IBWMC with a "pending" notation. Due to travel restrictions from COVID-19, and the difficulty in getting the lab technicians on board ships, these extensions are issued with some frequency at this time, but likely will be more difficult to obtain as the barriers are lifted.

However, delaying the test until after the dry dock period has other challenges, even if the vessel's departure is not delayed.

Later testing often increases the costs and offers many logistical obstacles in completing the commissioning in a timely manner. Vessel's sailing schedules often change on short notice.

Moreover, if there is a problem with the BWMS installation which is related to the installation work by the shipyard, then it can be more difficult to have the problem rectified once the vessel has left the yard. TO

1.2% of low sulphur oil exceeds limits – Maritec

With 1.23 per cent of VLSFO used on vessels proven to have a sulphur level outside the regulatory limits, it raises the question, at what point does the whole vessel become non compliant, Maritec asks

Singapore fuel test centre Maritec reports that 1.23 per cent of tests for the sulphur level in very low sulphur fuel oil (VLSFO) show that sulphur is between 0.51 to 0.53 per cent.

This exceeds the mandatory allowable 0.50 per cent, under IMO 2020.

Although having one reading of fuel with sulphur of 0.53 per cent does not necessarily make the vessel uncompliant.

"IMO has adopted a 95 per cent confidence testing boundary," says John Ren Di, VP business development with Maritec.

"However, this applies only to in-use and onboard samples, and not the sample taken at the manifold." (The manifold is the bunker loading connection on the tanker).

"Given that there will be variability between test results, even from identical samples tested in the same lab, it raises the question: when does an individual test result indicate that the tested VLSFO fuel is compliant?

Ship operators need to fit sampling points to existing ships built before 01 April 2022 no later than the first IAPP renewal survey after 01 April 2023. For new ships they need to be designated on delivery.

Definitely, in-use and onboard samples cannot exceed the maximum limit of 0.53 per cent (by mole). If sulphur content is found to exceed 0.53 per cent, then the source of contamination must be detailed, and evidence provided indicating that all possible steps were taken to ensure compliance.

"It would be prudent for vessel staff to witness and document the sampling and sealing by Port State Control Inspectors," said Mr Ren Di.

"Ideally, they should take representative samples of their own and countersealed by the sampling inspector for independent verification in case of dispute."

Maritec recommends that, in addition to routine full analysis on new bunker samples, crew also take onboard and in-use samples.

Maritec provides the sulphur verification kit to all vessels in their testing programme.

"There is always a possibility of loading non-compliant fuel onboard. Mitigating this risk begins with sourcing and purchasing compliant fuel oil and reducing the risk of poor-quality fuel oil being delivered to the vessel," said Mr Ren Di.

"Knowing the appropriate limits at each stage of the process will help keep vessels compliant and operating in line with IMO's objective to reduce air pollution and protect the environment

In June 2020, Maritec was acquired by Centre Testing International Group (CTI Group). Within a few months, the Marine Services Division of CTI Group was fully integrated with Maritec. TO

How bunker markets changed in 2020

There were many changes to bunker markets in 2020, including effects of COVID-19, IMO 2020 low sulphur rules, and the the withdrawal of many large banks from bunker financing. And we may see price rises this year. Søren Høll, CEO of KPI OceanConnect shares his views

By Søren Høll, CEO, KPI OceanConnect

In 2020 we saw a major disruption from the compound effects of Covid-19 and IMO 2020.

For bunkering hubs in some oil export regions, such as Fujairah, the decline in the number of tankers arriving to load crude cargoes had a noticeable impact on total bunker sales.

This was especially visible when OPEC+ flooded the market with crude in Q1 and Q2, and large parts of the fleet were used as floating storage.

By comparison, Singapore and Rotterdam's total bunker volumes were up considerably year-on-year.

IMO 2020 fuels

For the most part, we saw plenty of IMO 2020 compliant fuels.

In smaller markets, procuring compliant products has often been challenging. But shortages have been very rare in the major hubs.

Oversupply and depressed global demand have so far helped mitigate many of the supply and quality issues that were widely expected to challenge bunkering last year.

While there have been fewer quality issues than many analysts predicted, this may have been partially masked by the pandemic and the depressed oil price.

However, demand for distillates that are currently being used in VLSFO will rise.

There are likely to be more challenges ahead, and some of the issues on quality and availability that sparked concerns in 2019 may rear their head.

The global sulphur cap has created an inherently more complex marine fuels landscape.

Safety, compatibility, and compliance have become more interlinked than ever before. Finding the right fuel, at the right time, for the right vessel has become substantially more challenging outside the major hubs.

Price is still key, but there is now more to consider than simply the basic cost of the fuel.

Withdrawal of large banks

The biggest change that we've seen in the last 18 months has been the withdrawal of many large banks from the commodity trade. This has included ABN AMRO, Rabobank and BNP Paribas.

This is in light of losses they've suffered in recent years from the financial malpractice of certain unscrupulous marine fuels players.

They seek to cut their exposure to cyclical markets in light of increased regulation, greater capital requirements.

With their departure, the bunker industry has seen a major decline in capital availability to all but the strongest players.

This has created additional costs, and liquidity and transactional complexities for shipowners.

A perception of lenient corporate governance further inhibits banks from lending to the sector.

Forensic due diligence has become far more common.

2021 cost rises?

We're expecting to see crude oil price rise this year, which will inevitably lead to higher bunker prices as a consequence.

Several financial institutions have already predicted this, and with the huge volatility in bunker prices last year, we're already seeing prices gradually rise.

VLSFO, for example, dropped to $150 per tonne in May 2020, but has since risen to the $500s.

When costs are higher, there's a greater incentive to squeeze value from blends.

Unfortunately, this can often result in unscrupulous suppliers using cheaper or less suitable feedstocks that can have a catastrophic impact on ships' safety.

As we continue to endure price volatility in the immediate, if not long term, hedging and risk management are becoming even more important for shipowners.

Reduced volatility lowers their cost of capital, while knowing there will be no abrupt cost rises enables them to plan ahead and futureproof their liquidity. TO

KPI OceanConnect claims to be "one of the world's largest and most experienced independent marine energy service and solutions providers," established by the merger of KPI Bridge Oil and OceanConnect Marine. It has offices in Athens, Denmark, Dubai, Hamburg, Hong Kong, Istanbul, Jakarta, London, Miami, New York, Rotterdam, Seattle, Seoul, Singapore and Tokyo.

Navtor moves into vessel performance

Norwegian e-navigation company Navtor is expanding into the world of vessel performance, following a private equity company taking a majority stake, and the acquisition of Houston's Tres Solutions

Norwegian e-navigation company Navtor is expanding into vessel performance management services, by acquiring Tres Solutions, a vessel performance analytics company based in Houston.

The acquisition follows Silicon Valley private equity firm Accel-KKR buying a majority stake in NAVTOR in August 2020. Accel-KKR has $9bn capital under management, and over 50 technology companies in its portfolio.

Navtor is led by electronic chart veteran Tor Svanes since 2012. Mr Svanes formerly spent 18 years as president and CEO of C-MAP Norway, a company he founded, which was subsequently acquired by Jeppesen. Navtor was founded in 2011.

The acquisition has been done with money from Accel-KKR, as part of a plan to turn Navtor into a "platform" with a range of services, Mr Svanes says.

Navtor serves 7000 vessels, with customers in 60 countries, and 13 offices around the world. Navtor has a "particular stronghold" in the tanker and bulker segment.

It is increasingly speaking to operations staff at shipping companies, not just people who work in navigation, Mr Svanes says.

According to its own analysis, Navtor is the largest company in the world in e-navigation, with a 15-16 per cent market share distributing official electronic charts (ENCs), and distributing other navigation publications. The second and third biggest companies have a 14 and 12 per cent market share, Mr Svanes says.

The company calculates that 80 per cent of the "e-navigation" market is held by 8 companies.

The company also makes software for displaying electronic charts, as an ECDIS "kernel" which ECDIS manufacturers can put into their own hardware.

A third business line is "Navalytics", where vessels have an AIS data recorder onboard. The data is collated centrally, so Navtor has data about every ship in the world, it is "the most updated ship database in the world," he says.

Navtor talked to a number of different vessel performance companies, before making the acquisition. "Tres Solutions is the best one we can see in the market," Mr Svanes said.

Tres Solutions

A unique factor about Tres Solutions is a very specific vessel monitoring and onboarding process, says Aaron Holton, CEO of Tres Solutions.

Each vessel is different. The company created very flexible "platforms" for understanding how different ships behave.

The system is firstly configured around the specific type of vessel. You can configure it to the specific engine type, such as 2 or 4 stroke, and other parameters specific to the vessel. "It feels like a bespoke solution," he says.

Tres Solutions offers what it calls a "white glove" service making dedicated models for customers, put together by the company's in house marine engineers, naval architects and people who have sailed onboard the same types of vessels.

There are various intermediary steps customers can select, between the standard models and the white glove service.

It offers "savings as a service", where companies make a contract with the company where they pay based on its ability to save them money.

It also aims to provide better decision support tools for customers, such as understanding the current hull and propeller performance.

Its staff includes both "software engineers from big tech" and "naval architects that have worked for some of the largest shipowners in the world."

The sources of its data include speed logs, distance travelled over 24 hours and fuel consumption. Information about equipment operation can be added, such as fuel used by generators. Much of this is included in the traditional noon day report, Mr Holton calls it a "noon report on steroids".

To send the data to shore, Tres Solutions has different options depending on what connectivity is available from vessels, ranging from offline to fully online solutions, with hybrid solutions in between.

It can be put together with weather data from outside agencies. It collects technical details of the vessel from sources such as manuals, propeller data, general arrangement plans.

The data goes through a second validation layer on the shore, including with human monitoring. The company likes to be able to validate all data with another data source. "We have 200+ system based validations based on the DNA of that vessel," he says.

Tres is sold by annual or monthly subscription, based on the number of vessels, with different options available which will change the cost.

Tres Solutions also works with some charterers, who sometimes push for their shipowners to use systems like Tres to provide them with better data. Many charterers want to collect data for their own emission performance.

"We've seen a big growth in demand among charterers as they start to recognise the value of systems like this," he said.

It has an entry level service with data capture and some series analytics, all the way to the "white glove" service. (Although the products may be re-configured following the acquisition).

Following the acquisition, Tres Solutions' offices in Houston, Mumbai and Copenhagen will also be Navtor offices.

Its software is likely now to be integrated with Navtor's fleet monitoring tool Navfleet, to offer a single integrated solution for customers, says Arild Risholm Sæther, chief business development officer for Navfleet.

Navfleet can be used to track and monitor vessels, compare their route against the planned route and charter party requirements. The same information is available both onshore and in the office.

Navbox

Navtor provides a hardware device called "Navbox", which sits between the vessel communication infrastructure and its navigation systems.

Electronic chart updates can be sent to the chart display system (ECDIS) via the Navbox, so there is no need to use any USB drives or e-mail attachments, which can be a source of cyber risk.

The Navbox can also send AIS data back to shore, including data about surrounding vessels, from its integration with bridge equipment.

All of these data files are very small – they do not contain any images, videos, or other large sources of data.

Trelleborg – specialist hoses for chemical tankers

Swedish polymers specialist Trelleborg makes equipment for ship to shore transfer of specialist cargoes. This case study explains how its hoses were used for sulphuric acid transfer in Peru

By Jonathan Petit, commercial manager, Trelleborg Oil and Marine

Specialist equipment is needed for the loading and unloading of chemicals that pose a hazard for people, equipment, and marine environments.

For infrequently served chemical terminals, it is difficult to justify high CAPEX solutions.

Demand for these terminals is often in areas with limited space – or where building large infrastructure would have a disproportionate impact on the marine environment.

The Mina Justa [copper mining] project in Peru faced these difficulties.

The project will consume the equivalent of a chemical tanker full of sulphuric acid every eight to twelve days, which is transported first via tanker and offloaded at a terminal in Marcona, Peru.

Marcona's sea conditions make it difficult to construct fixed infrastructure, as the sea depth means that any fixed pier must be unusually long.

This level of construction would have knock on impacts on marine ecosystems in the area, and make it difficult for local fishing boats to navigate the waters.

Therefore, the project owners sought to design a terminal that posed as little impact and risk as possible.

Reel on floating platform

The project owners worked with Trelleborg and its Chemiline marine transfer hose design.

The hose is used in a floating configuration and attached to a reel.

It allows for a floating platform able to service any size of tanker that fits in its multi-buoy mooring capabilities.

The floating line is fully recoverable onshore when not in use, meaning that there are no piping or other assets left at sea.

The hose is 850 metres long when fully unspooled from the reel, with 550 metres of the hose floating when deployed.

Chemline being used for ship to shore transfers of sulphuric acid in Marcona, Peru

Building fixed infrastructure of this length and size would have undeniable impacts on navigation and local ecosystems – and incur significant costs in construction.

Sulphuric acid

Sulphuric acid is extremely corrosive and very dense.

Any chemical transfer requires hoses designed to cope with the unique stresses associated with the product handled and the environment.

This means that the vital hose components need protection from the corrosive nature of the product handled. While the hose structure must withstand the physical forces associated with transfer at sea.

This performance can be delivered through a fluoroelastomer (FKM) continuous inner liner, which stops the product handled from reacting with the rubber or the metal nipple flanges and prevents the potential disbonding that could occur with a nipple-based hose construction.

Pressure must also be considered. Sulphuric acid has a density of 1830kg/m3, which means there is a requirement for the proper rating of hoses for repeated high-pressure transfer and designed to ensure that this pressure does not degrade the integrity of the hose.

Trelleborg's Chemiline hoses have a dual carcass to provide resistance against both internal pressure and external forces, ensuring long term durability during repeated transfers.

Coupled with a unique nippleless design, this protects the hose from bending forces by eliminating the stiff metal connector, alongside a marine breakaway coupling to protect the hoses from excessive tensile forces.

This reduces the risk of premature wear and ensures the routine completion of transfers safely. TO

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