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Direct ship to ship transfer of cargo (STS transfer) is a growing business for some

 and a way to do illicit operations for others. It appears to be on the increase
 although safety and legal concerns continue



Regulating and financing shipping decarbonisation

Shipping decarbonisation won't happen unless rules are made, incentives created and investment is available. An ICS panel debate explored this, with a former EC DG of transport, the chairman of V.Group, and head of HSBC's Centre of Sustainable Finance

hipping decarbonisation is not free. To get there we need carrots – incentives and investors who want to put money behind it – and sticks – penalties for not doing it.

Both are around the corner, at least in Europe, where the European Union's Emission Trading Scheme (ETS) is expected to be applied to shipping, and where there are investors with funds looking for a home with some sustainability score.

The International Chamber of Shipping (ICS) put together an online panel debate on the subject on Jan 13 (link to webinar online is below). Speakers included a former director general of both transport and competition with the European Commission, the chairman of ship management company V.Group, and the head of the Centre of Sustainable Finance with HSBC Bank.

Esben Poulsson, Chairman of the International Chamber of Shipping (ICS), said he thought there is currently a lot of misunderstanding between the shipping industry and regulators. But the misunderstanding goes in both directions. The industry is both not understood and misunderstands what policymakers are trying to do.

European Union

Discussions are continuing in the European Commission about how to disincentivise emissions from the maritime sector. The main method of doing this in Europe is putting a price on carbon, via the "Emissions Trading Scheme" (ETS), where companies are required to buy the rights to emit carbon, at a price set by a market.

"The pricing of carbon certainly helps but is maybe not sufficient on its own to achieve transformation," said Sir Philip Lowe,



Screenshot from the ICS webinar. Top row: Sir Philip Lowe, partner, Oxera Consulting; Esben Poulsson, Chairman, ICS. Bottom row: Zoe Knight, managing director and group head, HSBC Centre of Sustainable Finance; Graham Westgarth, chairman of V.Group

partner, Oxera Consulting in Brussels. He is both a former Director-General Energy, and Director-General Competition, at the European Commission.

The European Union sees the introduction of ETS to shipping as following its introduction to aviation, where it currently applies only to flights within the EU, he said.

Similarly, ETS for shipping may be applied only to voyages which are entirely within the EU's boundaries, rather than deep sea routes, he said.

The current ETS price (Eur 34 per ton CO2 at the time of writing) is high enough to give an incentive to emitting less carbon.

A weakness of ETS, as applied to land industries, he said, is that many industry sectors have demanded exemptions, saying there is a risk of "carbon leakage". This means the carbon price pushes an industry outside the EU, so the manufacturer doesn't have to pay the carbon price. Europeans still buy its products, but no longer have the industry.

Sir Philip emphasised that the proceeds from selling ETS credits go to the budgets of member states, not the EU budget, and would not be used to directly support the European Union's recovery plan.

"The aim is not itself to generate money for the European Union. The original aim is to incentivise operators to use technologies which are low in carbon."

In response to the shipping industry's arguments that it is better to regulate emissions internationally through IMO, he said that the EU wants to move faster on this than many other countries in the world.

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1 year (7 issues) - £195 Subscription hotline: Tel: +44 (0)20 8150 5292 sub@tankeroperator.com While IMO should set the overall strategy and roadmap for shipping, individual countries should have freedom to set their own speed of decarbonisation. "A global strategy doesn't imply everyone has the same speed for getting there."

"Just simply saying we're going to reduce emissions by 50 per cent by 2050 doesn't seem to be enough to convince anyone in the [European] political world that we're going in the right direction."

And, there are "people under pressure to do things under a local and regional level."

Regulation

The European Union may also introduce regulations to decarbonise. "As a former director of competition, I am not immediately in favour of regulating. Ideally one should look for a market based mechanism. But a market based mechanism doesn't make sense if there are no alternatives [a market can choose from]. Regulation of certain structures and conducts is probably inevitable."

"The Commission is thinking about whether there should be some additional legislation to limit the carbon content of maritime fuels on a transitional basis."

The Commission is also looking at the availability of clean fuels and how they can be increased.

"Maybe we need slower ships and bigger ships, but that's precisely the opposite of the direction we've been going in."

Coalitions

Sir Philip suggested that the maritime industry could form coalitions with other organisations to achieve its climate goals.

A similar approach has been successful in cities. "The biggest successes in terms of sustainability in West Europe and elsewhere have been coalitions run by city institutions together with industry, local communities, regulators to reach a result," he said.

"A lot of the better regulation has come through those successful city initiatives." The shipping industry should be "taking examples from other sectors in transport, mobility and urban planning."

"A port cannot have an objective of being a clean port unless it has a strong coalition with shippers who use the port."

HSBC

Zoe Knight, managing director and group head, HSBC Centre of Sustainable Finance, said that the "financial system" is being asked to take responsible for the emissions it is financing. But we also see we have an economy still 95 per cent dependent on fossil fuels, and renewables responsible for only 10 per cent of power. And shipping is responsible for 95 per cent of trade flows, and only responsible for 3 per cent of emissions.

"So we need to get this right, in order to keep powering our economies the way that we are used to."

The 2015 speech by Mark Carney, then Governor of the Bank of England, when he talked about the 'Tragedy of the Horizons,' is well known in financial circles today, she said. This 'tragedy' is that finance typically looks at the future on a 2-3 year horizon, too short a timeframe to consider the impact of climate change.

Mark Carney's idea is that "climate decisions are integrated into every financial decision."

This means that better information needs to be available. To encourage this, an international "Task Force on Climate-Related Financial Disclosures (TFCD)" has been established. Its current membership manages \$156 Tn of assets.

HSBC is looking at its exposure to emissions in "high impact sectors", and reviewing what its "strategic position" should be on financing them, and how to be more transparent in how the information is disclosed. This would lead to adjustments in the "opportunity set" of which projects get financed.

Government central banks have started asking banks to "stress test" for climate risks. While shareholders have been asking about climate issues with their shareholdings for 15-20 years, the banking risk departments "have been less vocal on thinking about climate risk," she said. So governments are forcing this to change.

Overall, it is not yet clear what the best path forward is, in terms of which investments to make, taking the climate into consideration, she said.

But there is increased expectation that emissions will be recorded, and financial companies will provide data on which sectors and industries they are financing.

"Transparency helps capital find its way to products in its mandate. It allows shareholders to determine whether climate plans are appropriate to get to net zero, or whether climate plans are just ticking the box."

Another trend is the growth of green bonds, where money must be invested in something which has a certain level of green-ness. There have been a couple of green bonds providing finance to the shipping industry, at around \$100m, "mainly by Japanese shipping companies".

Green bonds are currently only about 5 per cent of the total bond market,

"But that shift is starting to occur."

The green bond movement also drives more transparency into how the money is spent and what emissions are caused as a result.

Another way to integrate sustainability into financial products is to make loans where the interest rate depends on a certain carbon emission reduction metric.

HSBC has recently started doing sustainability linked loans in aviation, with energy efficiency goals and fuel KPIs as the metrics.

If the shipping industry could give stronger signals about its decarbonisation roadmap, it could help the financial sector move more quickly, she said.

The Energy Transition Commission, a government and industry backed think tank, is "looking at breakeven pricing points to incentivise shipowners to make those investments," she said.

50 countries have included hydrogen policy



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initiatives as part of their climate plans. "It showcases the seriousness of intent around fuel switching," she said.

"The carbon pricing element, that is necessary to change behaviour, will increase in profile in the run up to COP 26," she said. [COP 26 is the major United Nations carbon meeting to be held in Glasgow November 2021].

For a carbon pricing project to be successful, the politicians need to be transparent about where the money will go. This was one of the success factors for a carbon pricing scheme in British Columbia, Canada, she said.

There are concerns in financial circles about the use of carbon offsets on a wide scale, because it means that the CO2 is still being emitted. Although carbon offsetting can work on an individual project to deliver "net zero".

One pathway forward for shipping is to ask its customers, such as large consumer goods companies, to set standards for the energy efficiency of ships that they charter.

Something similar is happening in the steel industry, where steel companies have worked together with car companies and construction companies to create a "responsible steel label." The support from these customers has helped de-risk the investment in lower carbon steel production facilities, she said.

"Creating those coalitions, to have the responsible emphasis around supply chain management, I think, is probably the next way of thinking."

"Is your biggest customer thinking about this, if so, talk to them and get them onboard to create a demand [for your decarbonised product]"

While financiers shouldn't be telling industries what to do in their own decarbonisation roadmaps, they can help facilitate this relationship between supply and demand of products, she said.

Graham Westgarth, V.Group

Graham Westgarth, chairman of V.Group, said, "this whole subject is fascinating, a little scary, but also an exciting opportunity for shipping. We haven't, in our lifetime, seen anything quite like this."

"Decarbonisation is inevitable. We need to look at it like that, and determine what are the opportunities for us."

Mr Westgarth has previously held senior roles at Gaslog, Teekay and Maersk UK, and is a past chairman of Intertanko.

"From a greenhouse gas perspective, we [shipping] move goods more efficiently than any other form of transport. But if we move beyond that and demonstrate a clear roadmap towards decarbonisation, we have a much better opportunity in terms of being more widely understood and accepted."

"It was interesting to hear Zoe talk about

[how] having that clear road to decarbonisation would assist you, in determining what financial instruments would be appropriate to support the industry," he said, referring to the previous speaker. "Marrying that up is a real opportunity for us."

"To develop that roadmap - we really need to be able to explore new technologies, learn from other industries, engage with regulators, technology providers, financial, government bodies and other stakeholders in a positive and proactive way. We need to masters of our own destiny."

"It was interesting to hear [Philip Lowe] say you are not necessarily in favour of regulation. But regulation will be part of this. What we need to do is shape the legislation, so it is fit for purpose. That's an essential component."

"There are some challenges in our industry that may not apply to other industries.

"This is a hugely fragmented industry, not just from a ship owning perspective. There are hundreds of shipyards, suppliers of equipment, representative organisations. We have many vessel types, trading patterns. It is a very complex industry."

"Comparing it to the car industry, the car industry controls the supply chain. They design cars, contract the equipment, sign contracts for delivery of the cars."

"It becomes very difficult to find solutions which are optimum if you're only looking at one particular element, not the whole supply chain."

"That takes me to the role of IMO. It is clearly a legislative body on the plus side. Its approach up to now has been flag neutral. That has meant that we created this level playing field, which I personally feel is essential for the sustainability of shipping."

"On the negative side, IMO can't put legislation in place which extends beyond supporters of the shipping industry itself. It is a technical body that lacks commercial understanding and expertise."

"It is incumbent on us to try to educate the regulators to understand how shipping actually works, how people make money, lose money."

"I'm scared about local and regional legislation. It makes it very complicated, it adds costs, and I don't believe it provides the optimum solution."

"People on ships have to work under extreme duress trying to meet regulations. Failure to meet regulations has a potential legal impact on them."

Technology

If I think about technology, there isn't one solution. It could be ammonia, it could be hydrogen, it could be biomass, it could be fuel cells. My gut feeling is it will be a combination of all of those," Mr Westgarth said.

"We need to find a way through exploring them - to find what will provide the best solution."

"Building out the infrastructure will require billions of dollars, will take many many years. There will be a transition period.

"Most people see LNG as a transition fuel, just to get to the end game of this."

Referring to a comment by Sir Philip saying maybe slower ships were best, Mr Westgarth said the term "optimum speed" might be better to use.

"The industry went down this path of slow ships before. You had ships getting in trouble because they didn't have power to withstand the environment. I want to flag that potential danger."

"There's a danger of getting it wrong, we can't afford to. We need to master technology with regulation, with any market based measurement and any financial instruments. It is very complicated, it requires the best brains."

"It requires the shipping industry to be much more open and engaged in a way it has never done before."

Espen Poulsson, ICS

"I am relieved to hear Philip is not necessarily supporting a plan of imposing regulation," said Espen Poulsson, Chairman of the Board of the International Chamber of Shipping (ICS).

"But at the same time we all accept there has to be regulation."

"Philip's comments on ETS do not coincide with my understanding of it. I thought it was a money grab on the part of the EU, this is what I keep hearing."

"The one thing I will stand up for - to Philip - is on this question of global rules. We have IMO, which Graham [Westgarth] quite correctly says is a technical body."

"In truth it has become more of a political body, because a lot of the people there are not that technical. It means an association like ICS has a bigger job to do. Very often we are explaining to people how these things work."

"We are not anti-regulation, we are anti regulation which is not well thought through. Ballast water regulation - 14 years in the making - is a perfect example. We are trying to avoid a repeat."

"The train has left the station, make sure you are on it," he concluded. "I think we all understand what we need to do. How we get there is a long and complicated path. [Shipowners] don't control our supply chains. Shipowners get all the stick, we're [just] the front face of it."

This article is based on the ICS Webinar, "Industry Transformation - What does it take to realise the 4th Propulsion Revolution" held on Jan 13. A video is online at https://attendee.gotowebinar.com/ recording/4858278301531423499

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Seafarers and Covid-19 – ship management perspective

The CEOs of Anglo Eastern and Synergy Marine Group shared their perspective on seafarers, COVID-19 restrictions and who will do the vaccinations, at a webinar organised by ICS

020 showed us that shipping, generally speaking, is exceptionally resilient," said Bjørn Højgaard, CEO of Anglo-Eastern Univan, and chairman of the Hong Kong Shipowners Association.

"I was very worried when we saw the first lockdowns and downturns that shipping would be hard hit. But apart from the cruise ship sector, shipping has generally weathered this downturn well."

"For a ship manager, the overriding challenge was this crew rotation issue.

"It was shameful to see the 'beggar my neighbour' policies adopted by many governments. 'we like the cargo, cargo ships, but we don't want to facilitate crew change"".

"If I have one ambition for the year (2021), it is, at the end of the year, seafarers have keyworker status, they have been vaccinated, we have open borders to do crew rotation and flights are available."

"There's a risk that, unless we get seafarers that key worker status, we will have difficulties attracting young people to this industry. That's a real risk and one I worry about long term."

"We keep working on that and managing the bottlenecks."

"One learning has been that preparedness pays off. Acting early, decisively has proved a good strategy. If you want to do crew rotation, get it done, and buy yourself some time. It can be difficult when things lock down."

The restrictions imposed by different countries have been very varied. "At some point in the last year, to do a crew change in Hong Kong you had to do cargo operations. To do a crew change in China, the crew nationality had to be Chinese." "To do a crew change in Korea was only possible after 2 weeks of quarantine for incoming crew. A crew change in Japan was only possible if a ship had been to sea for 14 days before calling in Japan."

"A crew change in Singapore was at one point only possible for Singapore flagged ships."

There have been some cases where it has been necessary to find crew members with a different nationality in a sales and purchase situation.

But largely, "the constraints have not been too much around nationality of crew, but a basket of constraints we've had to contend with."

Digital

"The other thing on our agenda is the continued



Screenshot from ICS webinar on Jan 27, "Shipping 2021 - Global Impact". Speakers top row: Nigel Pain, Head, Short-Outlook Unit, OECD; Bjorn Hojgaard, CEO Anglo-Eastern Univan; Rajesh Unni, Founder & CEO, Synergy Group. Bottom row: Frederik Kristensen, Deputy CEO, Coalition for Epidemic Preparedness Innovations; Guy Platten, ICS Secretary General

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digitalisation journey. That has been going on for a number of years, a journey not a destination."

"Technology, connectivity, continues to evolve. We get new tools and building blocks. I think it is a defining change to ship management. One which companies, who invest early and deeply, will be well positioned to take advantage of."

"The other big trend is the emissions reduction agenda growing in importance. Short term it is about optimising voyages, energy efficiency.

Longer term, we are looking at new technologies, hydrogen, fuel cells, ammonia."

"We recently commissioned a design for an ammonia-fuelled bulk carrier, hopeful it can hit the water in 2023. We are working on a (design for) nuclear reactors for propulsion."

This is an area where we're going to see continued pressure and we have to focus effort. Not just on the technology part, but making sure people onboard and ashore are ready for changes which are absolutely certain to come."

"One of the silver linings for ship management coming out of the pandemic is that we have all learned to use these tools. Videoconferencing, webinars."

"The ability to reach out to the ships, or seafarers at home, crew webinars with hundreds of people, connect the team on all time zones, and all offices. It is an amazing opportunity we are just seeing the beginning of."

Over the past year, Anglo Eastern staff have spent some of the time they have saved from not being able to travel, learning more about technologies, he said.

Synergy Marine

On the subject of crew change restrictions, Rajesh Unni, Founder & CEO, Synergy Marine Group, agreed that "most of the reactions from governments has been very ad hoc."

"Hong Kong, Singapore, or anywhere else. This has caused immense constraints.

"For example, when we had this two weeks quarantine [requirement] in Korea, we had cases where someone in the consulate had Covid and the consulate was shut for two weeks. How do you then even obtain visas? These kinds of challenges have become a nightmare."

"For ships [leaving from] China you need to have Chinese crew. So you suddenly see huge shortages of Chinese crew. And obviously there's an economic impact, the salaries and wages."

"The key is to have the mobility of seafarers between different countries and people respect that."

Mr Unni does not expect any long term

changes in the nationalities of crew, because training a master and chief engineer takes such a long time.

The challenge is easier for larger companies, with access to a diverse pool of crew, he said.

Neptune Declaration

Mr Unni is involved in the "Neptune Declaration," a document signed by over 300 maritime organisations, outlining the main actions which need to be taken to resolve the crew change crisis, and forming a task force to try to deliver it.

One pillar of the Neptune Declaration is sharing best practises for avoiding crew getting infected onboard, he said.

"We had cases where people tested positive when they arrived in Singapore. That resulted in a panic button preventing more crew changes.

How do we convince people there's a robust framework in place which can be audited and verified?"

Charterers also want to feel sure that shipping companies are following "gold standards" in reducing the risk of infection onboard.

A second pillar is encouraging easier airline travel.

"We have a biometric seafarer identification document, we have a convention, but many countries have not signed up for it. That was creating a bottleneck."

A third pillar is "bringing in charterers and sharing the incentives or challenges with them."

Some charterers have said they do not want to hire a vessel which has had a crew change in the few days before the vessel coming on hire. "We felt it was almost an impossible task for us to navigate," he said.

A special "Task Force" of Neptune signatories has been put together, which has already had discussions with Singapore's Maritime and Port Authority (MPA), which led to seafarers being added to the priority list for vaccines, at the same level as healthcare workers.

Remote working

Talking generally about remote working driven by COVID, Mr Unni said that the company is missing the social elements of interaction, such as to convey respect and empathy. "That needs a little more face to face interaction, for people to understand each other. That's something we really miss."

"When you have more remote working, mental health will need more priority than we have today. The physical space between working and home life gets blurred a lot." There is a growth in remote audits, which can be a "a great substitute for what we used to do, but not a complete substitute."

Crew vaccination

The webinar explored the question of crew vaccination and who will do it – when the industry is probably not able to rely on the crew home nations.

It would be better if some of the ports which ships call into, which may be in wealthy nations, are willing to vaccinate seafarers, treating them as key workers, Mr Unni said.

Many crew members would like to be vaccinated before they go onboard another vessel – but this could hold up the supply of crew.

To have 30 to 40 per cent of seafarers vaccinated by summer "would be a good start," Mr Unni said.

Anglo Eastern's Bjørn Højgaard added that it is not just seafarers having difficulties getting the vaccinees they need, it is also inspectors and surveyors.

To give a global perspective on the vaccination issue, Frederik Kristensen, Deputy CEO, of the Coalition for Epidemic Preparedness Innovations (CEPI) was invited to join the webinar.

CEPI was launched in 2017, to try to better co-ordinate world preparation for pandemics, after the Ebola outbreak in West Africa. "A year ago now we started focussing on COVID 19. We hadn't expected to be challenged so early in our life," he said.

CEPI runs COVAX, together with global vaccine organisation GAVI and the World Health Organisation. COVAX is a body aiming to distribute 2bn doses of vaccines (vaccinating 1bn people) by the end of 2021.

"COVAX is the only global [organisation] trying to ensure that we get some people vaccinated in all countries, rather than all people vaccinated in some countries, the situation we have now," he said.

The priority will be the population at the highest risk (such as the old), and after that, people defined as the "critical workforce". The definition of who qualifies as 'critical' will be made by the WHO.

"Clearly seafarers are on their radar," he said, both from a personal health perspective, since they may be at higher risk, and also from a security perspective, because they may spread the virus around the world.

This article is based on the ICS Webinar, "Shipping 2021 - Global Impact" held on Jan 27. A video is online at

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Seafarer happiness survey

The Mission to Seafarers' quarterly seafarer happiness survey, with 33 per cent respondents onboard tankers, found mixed responses

roviding free data and calls, investing in food and gym equipment, can make big improvements to quality of life for seafarers, improving mental health onboard and renewing passion for their work, according to the 4th quarter Mission to Seafarers Seafarer Happiness Survey.

The survey was undertaken with the support of the Shipowners' Club and Wallem Group. There were 2134 responses in the survey, completed online at happyatsea.org

Seafarers were asked to give scores out of ten for their general happiness at sea, and their happiness with their workload, training, interaction with other crew, access to shore leave, wages / salary, food onboard, ability to keep fit and healthy onboard, contact with family at sea, access to welfare facilities when ashore. It records

33 per cent of respondents were from tankers, 23 per cent container ships, 19 per cent from bulk carriers, 9 per cent general cargo, 7 per cent offshore vessel, 5 per cent ro-ro and 4 per cent cruise ship.

37 per cent of respondents were from the Indian sub-continent, 31 per cent from SE Asia, 12 per cent from Western Europe, 10 per cent Eastern Europe, 4 per cent Africa, 3 per cent central America, 3 per cent South America.

Many seafarers have reported that shipowners have started to make changes which have improved the quality of life onboard. Free data or free calls, more investment in food and new gym equipment have been appreciated according to the survey respondents.

The average overall happiness score, as an average of all the responses, was 6.37, up from 6.35 from the third quarter.

But the answer to the question "How happy generally when at sea?" was 6.3, declining from 6.35 in the previous survey.

"No one seems happy at all at the moment, and how could they? I am stuck on my ship, it is the hardest time I have ever known, even after 30 years of seagoing," one seafarer wrote. They added, "What is there to be happy about? We do not know when we'll be relieved, and even if and when we do, then we will be at home perhaps stuck with no work. This is all a mess". "Either the people in the office ashore do not understand what we are going through, or they do not care? Or maybe a little of both."

"Words are cheap, we need flights home," another seafarer said.

"The uncertainty of timely crew reliefs that has been experienced during the Covid crisis is clearly reflected in the resignation and antipathy that was seen in the responses," said John-Kaare Aune, interim Chief Executive Officer, Wallem Group, commenting on the results.

"Timely crew relief is not just a humanitarian issue, but can also be a safety issue. The governments must start to walk the talk when it comes to 'key worker' status for crew and the facilitation of crew changes."

Workload

The happiness with workload was 6.03, down from 6.04 in Q3.

Many seafarers claimed that the logs are flogged, the numbers fudged, and that there is a systematic failure evident.

One wrote, "we cannot do all the things needed in the time available, so it all gets lost in paperwork covering up what really goes on. It is normal for us, and everyone knows what goes on. Port State Control never really checks, and never follows up on what we write, so the system keeps on. Until there is an accident!"

Another wrote "Seafarers get things done, so if we do not, then it is our fault".

Other comments were that the impact of "incessant work reaches absolute breaking point".

"Usually at the end of my contract I am exhausted, now I am still exhausted but am no closer to home". Another added, "Workload is high, work hours high, stress levels even higher".

One respondent noted how even time off was not helping, "Even when I get some time, I never wake up fresh and fully rested. The effects of this over a full trip really start to impact me". Whilst another added, "Senior officers set the tone, and they are demanding more, always".

Shore leave

The happiness with access to shore leave was

Seafarer happiness in the Covid era - some unexpected survey responses

5.53, up slightly from 5.4. Respondents stated that shore leave is banned, and in ports where it is allowed, senior officers do not encourage or even allow it.

"Shore leave is no more, but as no one can visit the ship it has meant that we can reduce watches and have some time for rest and recreation. Even onboard is better now"

Conversely, we heard that the rise in remote inspections is making more work. "Inspections are even worse now. I spent hours wandering around the vessel to film spaces with a mobile phone, this felt like a waste of time".

"I spend my time in port running around a lot, so I should maybe be glad of some exercise. It takes it out of you though, I am very exhausted by the time we get back to sea".

One seafarer wrote, "crime has been on the rise, and we were told that any shore leave would be unsafe".

Training

6.61 said they were happy with the training they receive, up from 6.48 in the third quarter.

"Some receive great training and really embrace it, others nothing or poor quality, whilst some are responsible for their own and resent the cost and time.

One seafarer wrote, "We have been lucky, it seems that the company has invested and is now arranging every possible way to provide training for crew. Happy to perform the tasks, and learning while doing so".

One deck cadet wrote, "Mentoring and training onboard have been stopped. Officers

SHIP MANAGEMENT



Falmouth crew receiving gifts - photo credit: Mission to Seafarers

seem distracted or do not have enough time for us now""

Crew had received a lot of cybersecurity training leading up to the IMO rules coming into force in January 2021, but one person noted, "There has been so much cyber awareness and training, but no change to the ancient equipment we are using".

Intriguingly, deck cadets gave by far the lowest score for their general happiness (3.9), compared to other roles and ranks. But engine cadets gave the highest score (7.5). All other roles / ranks gave between 5.8 and 6.8.

Social interaction

Seafarers' rated their happiness with social interaction as highest in all the questions asked, 7.25. This compares to 7.24 in Q3.

But comments were very negative. Here are some of them.

"It is so hard to build good relationships onboard. People are stressed, tired and working hard."

"It feels like an endless cycle of long hours, with nothing to look forward to. How can you be motivated when every day is just the same?"

"I do not see smiles or hear laughs, now there is just a look of getting through and coping."

"I do not feel that we have enough people onboard, does not matter what any certificate says, it feels that we have to do so much more. Life onboard is work, getting ready for work, or recovering from work. There is nothing else".

"No one seems to be the same to each other as they used to be. It feels that people hate being here, and do not like each other."

"All crew members are miserable, everyone hates it at sea", with another stressed that "camaraderie is a must for us to have an easy contract".

A female seafarer wrote, "I wished there were more women onboard to talk too, as my colleagues do not understand what I go through daily".

There have been some company projects to encourage social interaction, but Mission

to Seafarers comments "to try and force interactions when there is stress, tiredness, and too little time can be a recipe for failure."

Food

Happiness with food onboard was scored at 6.61, down from 6.86.

"Even though the cook is good, we are eating very similar food all the time."

"Same food, at the same time, on the same day, it is getting boring."

One seafarer said, "the company has given us a little more in the monthly budget, and that has meant much better quality of food".

Exercise

Seafarer's happiness with their ability to keep fit and healthy onboard was 6.68, up from 6.64.

"Our ship has received a new table tennis table, and we actually had a tournament throughout the weekend. It was real fun," one seafarer wrote.

Although a common response was "I am too tired with no energy to keep fit".

"If we are monitoring free time properly, it will show that we do not have enough time to sleep, to rest or to have recreation".

Wages

Seafarers happiness about their wages was 6.48, up from 6.45. Although some seafarers said they felt luck to have an income, comparing their situation to others in their home countries.

There were responses from seafarers unable to work. "How can I carry on and provide for my family if I cannot go to sea".

There was a sense that the job market was flooded with certain ranks, particularly more junior levels, thereby driving opportunities and wage levels down.

One seafarer said, "money doesn't mean anything when we are losing our freedom."

Contact with family

There was a big increase in seafarer's happiness about their contact with family, up to 6.9 from 6.55. Many seafarers said their company has improved provision of communications services.



Richards Bay crew receiving gifts - photo credit: Mission to Seafarers

One seafarer said, "The one good thing that has happened since COVID is that our company has now improved satellite wi-fi, and we are able to access it free or at good prices. This is so important to me and really has made a difference".

However there are some seafarers who still do not have access to communications services, and the lengthy stays onboard due to COVID made the lack of contact with family very painful.

Welfare facilities

The lowest score was for people's "happiness with welfare facilities "when ashore, where seafarers rated 5.31, down from 5.48. The reason was lack of access due to Covid and security restrictions.

Some comments:

"I miss going to The Mission or any Seafarer's Club we would normally visit before this pandemic locked us down"

"if we could just walk or even get internal bus it would make things so simple. Instead, we lose time and money because we have to exit the port and get to the centre. It is not far, but still feels hassle as outside of ISPS control zone".

There were troubling reports of poor treatment of seafarers in quarantine, where seafarers were required to isolate themselves before being able to sign onto a vessel.

"We were made to queue up and felt like criminals, then taken to a facility more like a prison camp than a hotel", commented one.

Some seafarers have received charity support. "We received parcels of washing gear and chocolate, which brightened our days, thank you", said one respondent.

Broader patterns

Across ship types, tanker seafarers scored themselves less happy (5.9) than seafarers on bulk carriers (6.6), container ships (6.5) and offshore ships (6.1), although seafarers on general cargo ships scored themselves worse at 5.7.

There was an intriguing pattern with age, with 35-45 year olds scoring themselves least happy (4.2), compared to 25-35 year olds (6), and 45+ year olds (all bands above 6.8).

All regions scored between 6 and 7, with the exception of Western Europe (5.9) and central America (8.4), although central America was only 3 per cent of respondents (64 people).

By gender, only 3 per cent of respondents were female (64 people), which is roughly the same as the female seafaring population. These females did score themselves much higher than males on happiness, average score of 7.35, compared to 6.25 for males.

https://www.happyatsea.org/wp-content/ uploads/2021/01/SHI_Q4_2020.pdf

ICS Tanker Safety Guide (Chemicals) new edition

ICS has published the 5th edition of its Tanker Safety Guide (Chemicals), including updated advice on enclosed space entry, risk assessments, PPE, and a revised ship-shore safety checklist

he International Chamber of Shipping (ICS) has published the 5th edition of its Tanker Safety Guide (Chemicals), for people working onboard chemical tankers and other chemical carrying ships regulated under MARPOL Annex II.

This is the first update for 7 years (the 4th edition was published in 2014.

The working group to update the guide was



Chris Oliver, Nautical Director at ICS, a former VP fleet performance with Gearbulk, and master mariner at Mobil Shipping

led by Chris Oliver, Nautical Director at ICS, a former VP fleet performance with Gearbulk, and master mariner at Mobil Shipping.

It was written and reviewed by ICS members who actually operate chemical tankers, "to make sure it is current, relevant, updated and aligned," Mr Oliver says.

With this edition, effort has been made to simplify the language of the checklists it contains, to make it easier to use, and more likely to be used, Mr Oliver says.

The project team worked with consultants who had written checklists for the aviation industry, to get their input into how to make them more effective, and make the messaging more relevant to the user.

It has been written so that it aligns with the 6th edition of ISGOTT (the International Safety Guide for Tankers and Terminals) which was published in June 2020. ISGOTT is published jointly by OCIMF and ICS.

ISGOTT 6 "was quite a revamp, we wanted to make sure the Tanker Safety Guide (Chemicals) remains fully aligned to it," Mr Oliver says.

The new ISGOTT has expanded coverage in safety management, training and personal protective equipment.

The Tanker Safety Guide (Chemicals) doesn't

repeat what is in ISGOTT, but gives specific advice related to chemical operations.

It is designed as a reference book, to be carried onboard vessels, supporting existing knowledge and experience as well as in shore management offices of chemical tanker operators. When people are doing a particular operation they can see if there's advice in the book about the best way to do it.

The checklists associated with the book can be downloaded from the ICS website, so they can be printed onto paper, or incorporated into software.

Updates to the book

There have been revisions to the ship-shore safety checklist, which is completed by both ship and shore staff, and signed off by both.

Where previous versions of the checklist had columns for yes, no, remarks, now it only has a yes and remarks column.

"Either you comply with the item and tick the yes box, or there is a requirement to fill in the remarks box, saying why you cannot and what action has been taken," he says.

The checklist is not a regulatory document but can be considered as best practice for the ship / shore interface and is recommended to be used by both ships and terminals.

The new version highlights "key safety messages" with yellow boxes.

The book also focuses on the importance of senior management, visibly showing their support and delivery of the safety culture, within the company offices and onboard.

It further emphasises the need for "robust company culture" with effective hazards identification and barrier management, covering all operations ashore and afloat.

Methods to measure, assess, monitor and improve behavioural competencies of crew, and to continuously improve safety management skills are detailed.

A section on risk assessment processes has been rewritten and expanded on, including how to determine the need for risk assessment, the Tanker Safety Guide

Chemicals

Fifth Edition



competence you need to carry it out, identifying the high risk activities, and what is acceptable risk, with risk matrices.

There is an expanded section on crew "familiarisation", covering how crew and shore employees with duties related to safety and environment should be appropriately familiarised with them, as required by the ISM code.

There have been updates to a section on personal protective equipment (PPE) to bring it up to date and reflect how equipment has changed. The Safety Management System should specify the type and level of PPE required for working with specific cargoes.

There is a new recommendation for regular testing of enclosed space entry rescue and recovery equipment.

It is part of "quite an extensive chapter" on enclosed space. "Ultimately we shouldn't be having any enclosed space entry accidents, because they are avoidable," Mr Oliver says.

"At the end of the day people make mistakes. There's usually something behind that. When it comes to enclosed space entry, that can be absolutely critical."



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Flag registry news

ICS's Flag State Performance table; remote inspections from Marshall Islands; IOM's seafarer app; best growth at Panama; Liberia is fastest growing; Cyprus' green initiatives

he International Chamber of Shipping (ICS) published its 2020-2021 Flag State Performance table in January 2021.

Performance criteria included Port State Control (PSC) records, ratification of international maritime conventions, and attendance at IMO meetings.

The study found no clear differentiation in performance between traditional flags and open registers.

The highest performers include a number of open registers, several European registers and other traditional flags, including Japan.

Many of the largest flag states - including the Marshall Islands, Hong Kong (China), Singapore, the Bahamas, Cyprus, "continue to perform to an exceptionally high standard," ICS said.

Amongst the 10 largest ship registers (by dead weight tonnage), covering more than 70 per cent of the world fleet, none have more than two indicators of potentially negative performance, and five have no negative indicators at all.

However, "there are still a number of smaller flag states that have a lot of work to do to considerably enhance their performance, and shipowners should consider very carefully the prospect of using these flags, which may be perceived to be sub-standard," said Guy Platten, secretary general of ICS.

The 2019-2020 Flag State Performance Table was not published for Covid reasons.

The Flag State Performance Table can be downloaded from the ICS website.

Marshall Islands – 900 remote inspections

The Marshall Islands registry had conducted over 900 remote inspections during 2020, said Bill Gallagher, President, International Registries, Inc. (IRI), which manages the registry.

"COVID-19 has been a catalyst for change, and I expect to see much of the new technology integrated into our regular operations even as things normalize," he said.

The registry also developed mobile applications, and facilitated electronic registrations of vessels.

Isle of Man seafarer app

The seafarer welfare app "Crew Matters", offered by the Isle of Man Ship registry went live in January 2021.

It is available to seafarers on vessels under the Isle of Man flag. This is 400 vessels and 10,000 crew, the registry says.

Registry director Cameron Mitchell served as a marine engineer at sea for 17 years with shipping lines including Maersk and Farstad. The catalyst for developing the app was an apparent suicide on a vessel sailing under the flag, he says.

"We recognised that while there is support for seafarers in port, through the many brilliant chaplaincies and seafarer charities, the weak link is support while at sea."

The app supports social activities, such as live gym work-outs, "to get seafarers interacting more on-board to combat that isolation," he said.

If they have communications bandwidth, seafarers can access physical and mental wellbeing classes, fitness and yoga sessions through the app. There is a tool for seafarers to log their work and rest hours.

Seafarers who feel stressed or unwell can get access to a "Seafarers Help" chat-based advice service.

Panama – best growth since 2011

The Panama Registry has seen its best growth since 2011, exceeding the 230m gross tonnes mark for the first time, with 8516 vessels registered under the Panamanian flag by the end of 2020, it said. This is a growth of 6.23 per cent over December 2019 gross tonnes figure. The Panamanian flag is now used by over 16 per cent of the world maritime fleet by gross tonnage.

It added 1033 vessels to its fleet over the 2020 calendar year, of which 339 were newbuilding. The number of vessels being transferred to other registries, or having newbuilding cancelled, was reduced by 25.8 per cent compared to 2019.

The Registry introduced a number of other improvements during 2020, including a "complete re-engineering of the processes, incorporation of market analysis, characterization of important areas of the sector, and introduction of electronic documents," it said.

In April 2020, it began offering services to issue Public Deeds of Naval Titles and Mortgages electronically signed. As a result, 4089 documents (68 per cent of procedures) were received remotely.

Liberia "fastest growing" flag state

Liberia announced in December 2020 that it is the "world's fastest growing flag State for the second year in a row," growing by 8.06 per cent and 13.8m gross tonnes over the 2020 calendar year.

It is the fastest growing flag in Greece (where it is also the largest Open Registry used by Greek shipping companies). It is the fastest growing flag in Japan, China, Singapore, and the United States, the Registry said.

"This growth has not only been from newbuildings delivered this year, but from flag transfers thanks to Liberia's low cost to change flag, and our streamlined processes and procedures," said Alfonso Castillero, Chief Operating Officer of the Liberian International Ship and Corporate Registry.

Also in 2020, Liberia saw a 68 per cent decrease in detentions in the US, and was able to climb higher in Paris MOU flag rankings.

Liberia claims to be the first flag to introduce remote closings for ship registration, and the first flag to introduce remote inspections.

Cyprus Registry green incentives

In January 2021, the Cyprus Shipping Deputy Ministry announced that in fiscal year 2021, annual tonnage tax will be reduced by up to 30 per cent for each vessel that demonstrates proactive measures to reduce its environmental impact.

The discount will be calculated based on how much further a vessel goes to reduce emissions, beyond what is required.

For example vessels that have achieved further reduction of their attained EEDI compared to the required EEDI (Regulation 20 / MARPOL ANNEX VI) will obtain a tonnage tax rebate of between 5 and 25 per cent.

Vessels using an alternative fuel 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.

Any vessel detained for any reason during PSC inspection, that violates any regulation of the European Commission related to environmental protection, or in laid-up condition (warm or cold) during the calendar year, will not be eligible for the incentive.

Accepting LPG fuel stock for pre 2016 code gas tankers

Norwegian shipping company BW LPG wanted to use its LPG cargo as a fuel for a pre 2016 code vessel, since it offers environmental advantages over oil – but it needed a different regulatory regime to do so. This was developed by the Isle of Man Ship Registry

orwegian shipping company BW LPG wanted a regulatory methodology to permit a pre 2016 code VLGC (very large gas carrier) to be retrofitted to use liquefied petroleum gas (LPG), normally butane and propane as fuel for propulsion.

For the last four years, it has been possible for vessels to be designed and built to the International Gas Carrier code (2016 IGC code) and permitted to run on LPG fuel.

But for vessels built under the previous code (1983 IGC code as amended) this was not a permitted option.

So BW LPG had discussions with its flag, The Isle of Man Ship Registry (IOMSR), about how this could be changed.

Discussions began with IOMSR and BW LPG, as well as partners Wartsila Gas Solutions, MAN Energy Solutions and DNV-GL in 2018.

Aside from the fact that LPG is already being carried (as the cargo), it offers benefits over LNG (which was allowed as a fuel under the 1983 code).

LPG does not need to be cooled to cryogenic temperatures, so the storage tanks can be made from less expensive materials. There is a much wider availability of fuel gas, which can be supplied by road tankers at most ports, whereas LNG isn't.

"We looked at all the options and decided we needed to think outside the box," says Bill Liddell, senior surveyor who led the project on behalf of IOMSR.

LPG offers advantages over fuel oil. "Gas is cleaner to burn than fuel oils and allows a large reduction in particulate emissions, helping to meet ever-tightening restrictions placed upon the marine industry," he says.

After much discussion and research by interested parties, IOMSR put together relevant paperwork and submitted a design equivalence application to the International Maritime

Organization.

This equivalence, granted in March 2020, allows the use of LPG as a fuel on the VLGC BW Gemini, setting a precedent in the industry and enabling the IOMSR to issue the world's first flag acceptance of a modification to use LPG as fuel for older gas tankers.

"A full conversion of the ship, which has been in service for about ten years, was not an option because it would have run into millions of pounds and taken much longer to carry out," says Mr Liddell.

"Instead, it was decided to carry out a modification of the engine and fuel supply system, which was much more commercially viable."

The retrofitting work took place in Q4 of 2020 and lasted just over two months. It involved fitting the vessel with two extra LPG fuel storage tanks in the cargo area, a high-pressure liquid fuel system for the modified MAN Energy Solutions two stroke engines and significant upgrades to the fuel delivery and associated safety and control systems.

The work was timed to be carried out during the BW Gemini's dry dock period, to ensure the vessel was not out of service any longer than necessary. In November, BW LPG announced the successful completion of sea and gas trials.

Pontus Berg, Executive Vice President (Technical and Operations), BW LPG, said: "BW LPG has chosen to commit 12 of our VLGCs to be retrofitted with pioneering LPG propulsion technology. This is a significant upfront investment of over USD100 million, and it represents our willingness to act on the ESG front."

"Building new ships can provide the benefits of operating with LPG but comes at a heavy cost."

"Counting total emissions, a new ship represents about 70,000 tons of carbon dioxide in the materials and building process, compared to 2,000 tons of carbon dioxide for retrofitting.



Bill Liddell, senior surveyor for the Isle of Man Shipping Registry

"The sustainability outcome is much better from retrofitting than from building new vessels."

"We thank the Isle of Man Ship Registry for its strong support and for embarking on this journey with BW LPG to take the lead and advance technology closer towards a zero-carbon future."

The vessel is thought to have achieved a historic milestone as the world's first VLGC to be fuelled by LPG.

It has sailed on LPG propulsion across the Pacific Ocean to Texas for loading, another historic first.

This voyage is expected to produce twenty percent less greenhouse gas emissions and use ten percent less fuel overall, compared to regular fuel oil, according to BW LPG.

The work of IOMSR in gaining the design equivalence for their clients to enable the plans to go ahead, has paved the way for five other ships of the same class to undergo the same modification.

Ships in other classes will be subject to the same discussions and application for design equivalence should their owners wish to modify them to run on LPG. IOMSR is able to assist with its expertise, Mr Liddell says.

Mr Liddell spent 14 years at sea, nearly 4 years as a technical superintendent (much of

those years with gas tankers) and 23 years with IOMSR.

In November 2020 the IOMSR also became the first flag state to join the Getting to Zero Coalition which aims to drive shipping's decarbonization agenda by developing commercially viable deep sea zero emission vessels by 2030.

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Deloitte - improving chartering

Deloitte presented case studies of how it helped two oil majors improve their chartering processes with digital tools, speaking at a Digital Ship webinar. It may indicate how the roles of shipping intermediaries will be changing

onsultancy Deloitte presented two case studies of how it had helped two (name undisclosed) oil and gas majors improve their tanker chartering with new digital tools, with a presentation at a Digital Ship webinar in January, by Patrick Boles, supply chain consultant with Deloitte, based in Dallas.

Deloitte's port and shipping group provides professional services, including technology implementation, to the deep sea and broader maritime industry, including ports. Deloitte has 200,000 employees, with over 500 dedicated solely to maritime. Its staff include specialists in specific digital tools.

Mr Boles formerly worked as an owner and operator of inland barges and coastal barges in liquid trade on the US Gulf Coast.

In the webinar, he presented two case studies of projects he has worked on over the past two years with oil and gas companies, to improve how they manage their marine logistics, address pain points and capture value with the help of digital technology.

The goals of the projects were slightly different (described below) although both related to tanker scheduling, chartering, voyage management, demurrage and financial settlement.

Role of intermediaries

The software project indicates that we may be able to see changes in the working process between vessel owners, charterers, brokers, bunker delivery providers and other service providers, he said.

"I do see a push towards bringing them all in one workspace or platform to allow them to collaborate in a more efficient manner than they are today."

This does not necessarily mean removing any intermediaries. Shipbrokers are still used by both of Deloitte's oil major clients described here, and an important part of the process, he said.

But it is possible that some intermediaries in shipping are benefitting from the lack of transparency, having more of a value themselves because they are the only people who know what is going on.

"That's counter to many of the objectives that

we're trying to achieve here," he said.

"There are new busines models for them that are appearing as a result of this technology. I suspect they'll adapt to that going forward."

"I don't think they are going away, but I think they'll look different in the next 5 years."

"There's only one direction this thing is going, it is becoming more digital. That is borne out in demand we are seeing from our clients. They are accelerating their desired pace of increasing digital maturity."

Case study 1

Case study 1 was an oil and gas company which spends over \$2bn annually on marine freight.

It has two separate business units responsible for managing the cargoes.

Before Deloitte helped implement a new system, the work was done on spreadsheets developed by individual users, which were e-mailed between people. There was much e-mail and much redundant data entry. This led to suboptimal vessel planning and execution.

High reliance on e-mail and personal spreadsheets for moving data are "tell tale signs of an organisation that is not digitally mature," Mr Boles believes.

Deloitte started with an "Agile" process to work out how to design a better system, forming four "scrum teams" with a brief to make a 'minimum viable product' in under 14 weeks.

The Agile process emphasises developing tools which you can directly try out with customers to see how well it works. Sometimes people need to be persuaded to share unfinished tools with customers. But "that's how you learn," he said.

Case study 2

The second case study was for the chemicals group of an oil and gas major, managing "hundreds of millions of dollars" of freight spend, with many spreadsheets, e-mails and phone calls.

The company thought they would be able to improve their planning, optimisation, contract management and spend visibility, with better digital tools.

The software was implemented in a more

traditional "waterfall" or sequential way, with 3 months of design, including a business requirements review and a detailed design and build phase, mapping process flows.

This was followed by 9 months of build and implementation, including change management and user acceptance testing, to roll out the application. "We did a lot of training sessions, which are crucial," he said.

There is a fourth phase, called "sustain and improve," which comes after the software has been rolled out.

Working with Deloitte, they evaluated four different software vendors, including SAP and Oracle, and eventually chose Veson Nautical's "IMOS" platform.

The client considered Veson to be the market leader for management software for dry bulk and liquid shipping. Veson also provides professional services to help customers use the software. "The developers are familiar with the industry, they understand all the inherent challenges," Mr Boles said.

The client anticipated benefits of around \$15m as a result of the digital technology implementation, largely from reducing spending on base freight and bunkers, and reducing spend on demurrage, by reducing vessel delays.

They would also be able to reduce spend on outside companies, such as inspectors. "There's a tremendous amount of waste in the inspector hiring process," Mr Boles said.

They would benefit from better spend visibility. "They had millions upon millions of spend where they didn't really know where it was going," he said.

Avoiding repetitive work

A goal of both of the projects was to automate repetitive tasks, so that people can focus more attention on exceptional events.

Examples of repetitive tasks which can be automated are updating the "Statement of Facts" (a detailed chronological description of the activities of the vessel during the stay in a port), or sending out "cargo nominations" (instructions to a shipping company).

A different way to manage remote equipment monitoring

When one of your ships' equipment suppliers wants to monitor their equipment remotely, it sounds like a good idea, but you're worried about satcom bills, cybersecurity, and how to get the data through your corporate network. KVH offers another solution

quipment companies increasingly want to remotely monitor their equipment onboard ships. Shipping companies like the idea, but they are not sure that their satellite communications infrastructure can handle more data, they are worried about the equipment company running up big satcom bills, and worried about cybersecurity and getting the data through their corporate network.

Maritime satcom company KVH is offering an alternative – a completely separate satcom terminal and network onboard the ship, paid for by the equipment supplier, at rates starting at \$99 a month for light use.

It isn't just for equipment suppliers. It can be used by class societies providing remote surveys, charterers who want data about their vessels, and others.

The supplier can leave the contract at any time, and the shipping company can ask for the terminal to be removed at any time.

And although the shipping company is paying for the satcoms indirectly in most cases via purchases it buys from the supplier, the satcom cost is included as part of the overall package the supplier provides. So it can be part of the cost of servicing equipment, rather than IT costs.

Data communications speeds of up to 10 mbps, and 16 GB a month (with larger packages on request) are available. You can also buy a higher-speed data communications package just for a short period of time (such as one hour), for example if you want to get a video from the ship so you can better understand a problem, make a bulk file transfer, or do a software upgrade.

Most companies using the service will only want to send small amounts of data, for example the data from a group of sensors.

The service is available for nearly all of the world's shipping routes, the same coverage

as for KVH's "TracPhone V7-HTS" service. The only part of ocean on normal sea routes which is not covered is a strip of sea 1000km West of South America, which a vessel would traverse if going from say Chile to Australia.

One of the drivers for the service has been the big growth in remote surveys and remote equipment troubleshooting over 2020, driven by Covid travel restrictions, says Mark Woodhead, EVP mobile connectivity with KVH.

These were nearly unheard of back in January 2020, and are now commonplace.

Some classification society remote surveys involve gathering data from a vessel, by photograph or video. Data and good quality video together can give a surveyor a similar experience doing a remote inspection to if they were onboard.

Sven Brooks, senior director IoT business development KVH, believes that we will see a big uptake in sensors onboard during 2021. It will be "the year of maritime Internet of Things (IOT)," he says. "There's a lot of indicators of that, this trend will continue."

Companies are also looking to do more remote equipment troubleshooting and optimisation of operations, he says. They are also seeking to gather more data to use improving ship performance.

"Being able to collect this data, share the data and cross reference is a true game changer," he says.

When there is a problem, a remote expert can look at equipment immediately, rather than wait until the next port call for a service visit. From the crew's perspective, it can be easier fixing problems when the vessel is at sea, when people have more time.

Data would not be transferred against the shipping company's wishes, the shipping company needs to consent to it. But the bill for the communications is carried directly by



Mark Woodhead, EVP mobile with KVH

the supplier, not the shipping company's IT department. The shipping company does not need to worry about a supplier racking up a large bill.

The service may prove most useful on older vessels, which may have old satcom equipment and networks. With KVH Watch, they can have a completely new satcom and network infrastructure.

Offering the service is a big risk for KVH, because it takes on all the risk of providing the hardware upfront, in anticipation of receiving monthly fees.

But it may be better than the alternative which is asking a shipping company to pay upfront for another satcom terminal or take on a long lease for it.

If companies had a satcom system installed and then asked KVH to take it back a few weeks later, that would be very expensive for KVH, but the company decided that was an unlikely scenario. "We're pretty confident you're not going to send it back," Mr Woodhead says.

New services from suppliers The service meets a need from equipment

suppliers. They often want to provide more remote diagnostic support for the equipment, but cannot do it, because it is too difficult getting their data through the shipping company's communications infrastructure and firewalls, Mr Brooks says. So this gives them an alternative, of having their own infrastructure onboard a customers' ships.

Suppliers already using the service include electronics supplier Kongsberg, and IO Currents, a maritime maintenance data company in satellite.

One satcom service provider, TMS Maritime Solutions, is developing the idea of helping shipyards build "IOT ready vessels" making use of the KVH service.

It may make it possible to build sensors and communications systems into a ship while the ship is being built, so it can be monitored remotely from the day it is launched.

This is similar to how modern buildings are designed to have their heating and cooling systems monitored remotely, rather than adding on remote monitoring later.

"Shipowners are coming to the yard saying we'd like to see an 'IOT ship'. That term needs to be filled with life," Mr Woodhead says.

More technical details

The KVH Watch service can support multiple tenants. In other words, multiple companies can be customers at the same time, all sending their data through the same satcom terminal, but with the data packages arriving separate at the end. The same as it is with multiple cell phones communicating through the same communications tower.

As part of the service, KVH will provide wireless access points which can be installed around the vessel, perhaps in the engine area, bridge, or areas where the hardware is located.

The KVH Watch data travels on a dedicated secure path and does not go through the shipping company's network.

Arranging for a supplier's data to go through a shipping company corporate network can be a big hassle for both suppliers and the shipping company IT department.

For this reason, KVH Watch is designed as an air-gapped, dedicated IoT system.

In normal day to day operations, data will only be allowed to flow one way, from the ship to the shore, so it is impossible to hack.

Access to shipboard systems from land (such as to reconfigure equipment) can be

allowed only in tightly controlled situations, such as when a shipboard officer confirms that the access is permitted, and only for a specific period of time.

This intervention needs to be scheduled in advance, and a record kept of what has been done. The Wi-Fi access points are only available to equipment where the MAC address has been entered into the system, and during a time period fixed in advance, so no hacker can go onboard and gain access with a new device.

Communications are encrypted from the ship to the equipment supplier with X509 certificates.

The KVH Watch computer network is physically separate to the main ship business operations network, so a hack on one network cannot pass to the other.

Many shipping companies may feel reluctant to give suppliers any access to their systems. But they should also consider that what they are doing now is probably less secure, Mr Brooks says. For example, many shipping company staff communicate with suppliers and support people via WhatsApp, or Microsoft Teams on their corporate networks.



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Monitoring scrubber washwater

Scrubber wash water, the water which "washes out" sulphur dioxides from exhaust gas so it does not enter the atmosphere, needs to be itself monitored, before the water can be discharged to the sea. Chelsea Technologies explained more

crubbers are devices which scrub, or "wash", sulphur out of ship engine exhaust gas, so that the sulphur oxides (SOx) do not enter the atmosphere. Open-loop scrubbers do this using seawater. But the scrubber water, or "wash water", itself needs to be monitored, before it can be discharged back into the sea, to make sure it is not polluting the ocean.

The sulphur itself is not the main concern, because it is neutralised in the scrubber to form sulphates, which are considered safe to put in the sea in low volumes. Seawater contains sulphates naturally, and so adding more sulphates makes negligible difference.

There are bigger concerns around the acidity of the scrubber water, because this can make the water harmful for sea life. It can be more about changes to the local acidity rather than absolute acidity, because sea life will be accustomed to a certain acidity level.

Another concern is the turbidity (sediment) of the washwater. In normal operation, the scrubbing process should not add any sediment to the washwater. But there can be sediment if something is not well maintained or operating properly.

Also polycyclic aromatic hydrocarbons (PAH) – basically unburnt or incompletely burned fuel oil – is environmentally harmful, and this can be present in scrubber washwater if the engine is not well maintained.

The regulations are complex and have variations around the world in how they are implemented. Shipowners with scrubbers are



Adam Joliffe, Senior Sales Manager (Maritime) with Chelsea Technologies

required to have a system for monitoring the wash water, but whilst there are clear guidelines for some parameters to be monitored, others like PAH are still to be finalised and this is along with when a discharge can be carried, which also differs can cause confusion. The requirements can also be applied differently at both country and port level.

There is guidance from IMO under resolution MEPC 259 (68) (adopted May 2015) about discharge limits in wash water, covering acidity (pH), PAH and turbidity. Some of this guidance involves comparing the incoming inlet water with the outlet water from the scrubber before it goes into the seawater.

There could be more attention paid by regulators on scrubbers during 2021 with MEPC76, which will be of interest as more shipping companies turn to scrubbers.

Many companies installed scrubbers to meet

sulphur emission requirements coming into force at the beginning of 2020, but may not have seen the projected benefits of using them during 2020, as they have been able to take full advantage of the low price of low sulphur fuels during the year, says Adam Joliffe, Senior Sales Manager (Maritime) with Chelsea Technologies.

Over the 2020 calendar year, the price difference ('spread') between heavy fuel oil and very low sulphur fuel oil has been around \$50 a tonne, which may not be enough to justify investing in a scrubber, or maintaining it if you have one.

But this low fuel price was largely due to COVID and also the lack of demand for distillate fuels from aviation and motoring, Mr Joliffe says. Demand from aviation and motoring is expected to go back up again during 2021. At the time of writing (February 2021), the spread had already increased to over \$100 a tonne, a price which begins to make scrubbers make more financial sense.

More regulatory attention is also expected, turning some of the 'guidance' into rules. There may be a more detailed methodology for checking for PAH specified in the upcoming MEPC 76 meeting planned for later in 2021, Mr Joliffe says.

The best way for shipowners to ensure their scrubber water discharges are within legal limits, Mr Joliffe says, is to have a sophisticated, future-proof wash water monitoring system.

This means a small amount of cost – although installing an accurate monitoring device can be



marginally more expensive, however, this is still low when compared to the multi-million dollar investment of installing a scrubber, or the cost of any fines or detentions, Mr Joliffe says.

Chelsea's "SeaSentry"

Chelsea Technologies' device, "Sea Sentry', has sensors to measure PAH, UV Absorbance, turbidity, temperature and pH.

The system is installed on hundreds of vessels worldwide, and across a mixture of types. Some systems are installed by scrubber manufacturers as part of their installation, other systems are installed by shipyards.

Sea Sentry can be retrofitted to any existing open-loop, closed-loop or hybrid wet scrubbers. It is DNV type approved along with MEPC 259(68) measurement compliance from DNV and ClassNK.

Sea Sentry has a number of unique features, Chelsea says.

The measurement of PAH is done using fluorescence and absorbance. The PAH measurement is corrected for environmental effects of turbidity, UV absorbance and temperature interference via internal algorithm.

The Sea Sentry automatically corrects for the issue that once the PAH_{phe} level reaches 450 micrograms per litre PAH_{phe} (phenanthrene equivalent), the absorbance of phenanthrene will

significantly attenuate the fluorescence signal. So at low PAH concentrations, you measure the concentrations by using PAH_{phe}, and at higher concentrations you measure the UV absorbance of the signal.

Sea Sentry's can be used to monitor both the inlet and the outlet wash water, so that the operator can see how the properties of the water are changing as it flows through the scrubber.

The Sea Sentry has a "debubbler", taking air bubbles out of the wash water before measurements are taken. Bubbles can cause erroneous readings.

There is a system for cleaning sensor windows, using compressed air, which is provided from the ship compressed air supply. Keeping sensor windows clean is important to ensure accurate optical measurements. The operator only needs to set how often they want to do air purging and Sea Sentry will automatically carry this out.

Chelsea Technologies is able to supply newly calibrated sensors to a device just before it is installed or commissioned on a vessel. The Sea Sentry cabinet may have been sitting in a suppliers' warehouse for a number of months beforehand, but these months will then not eat up any of the 2 years between calibrations.

There is an onboard Solid Standards Optical Check Kit which you can use to check the Turbidity, PAH_{phe} and UV absorbance sensors , without the use of chemicals.

The sensors can be easily swapped over. When it is time for recalibration, the normal method is that new sensors are delivered to the vessel, they replace the old ones, and the old ones are sent to the laboratory ready for the next vessel or when calibration is due again, and there is no down time.

The Sea Sentry has a dual ethernet connection, so you can monitor what is happening from other parts of the ship, which includes settings, data and any alarms. As Sea Sentry can communicate via over ethernet using the MODBUS protocol the information /control can be made available to other 3rd party vessel systems where it could even be sent to remote monitoring operations.

The Sea Sentry can also provide some insight into the condition of the engine. If the fuel is not combusting completely in the engine, there will be a higher level of PAH (unburnt fuel) in the wash water.

Chelsea Technologies is a company specialising in designing and manufacturing sensors for working with water quality, maritime, oil and gas, deep ocean and defence markets for over 55-years. Chelsea Technologies has been making wash water monitors for over a decade.



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Are fuel cells useful for tankers?

Fuel cells, which convert hydrogen or ammonia into electricity in a "cell", may be an important component of shipboard energy in a decarbonised era. Corvus Energy of Bergen is making the first steps. Can they be useful for tankers?

re fuel cells useful for tankers? The short answer, according to Corvus Energy, is that fuel cells for propulsion are more likely to be applicable for short sea shipping. Perhaps they will be used in the short term to provide auxiliary power for tankers.

But over the longer term, if all fuels are decarbonised, the tanker industry will be choosing between hydrogen or ammonia fuel, and combustion engine or fuel cell / electricity to run the propeller.

Ammonia may prove better than hydrogen for long distance shipping, because ammonia is much easier to store than hydrogen, liquefying when cooled to -33.3° C, rather than -239.96° C for hydrogen.

Fuel cells with electric motors are similar in efficiency to combustion engines today, in terms of converting fuel to propulsion power. but the technology has more scope to improve as the market size grows.

A fuel cell, together with hydrogen storage, could be understood as a kind of battery. The hydrogen reacts with oxygen (from air) in the fuel cell and makes electricity – which can be used to power propulsion. Getting and storing hydrogen is expensive, but it can be cheaper than batteries, when you want large scale power. And a battery uses lots of exotic metals, and wears out over time, unlike a hydrogen storage tank.

Corvus Energy

Corvus Energy, based in Bergen, announced a tie-up with mass fuel cell manufacturer Toyota, to develop fuel cells for ships. The tie-up was made in December 2020.

Corvus has been selling batteries for ships, oil/gas and ports for some time.

The company has 421 maritime battery projects, amounting to over 300 MWh, including 23 on merchant vessels. There are 142 for port equipment, 110 on car and passenger ferries, and 146 on other vessels – offshore, tugs, workboats, fishing, research, cruise and yachts.

Corvus has a contract to supply batteries for



Geir Bjørkeli, CEO of Corvus Energy

the first zero emission tanker, "e5", currently under construction for Asahi Tanker Co., Ltd. of Tokyo, Japan, expected to go into service in bunkering operations in Tokyo Bay by 2022.

This is Corvus' first foray into fuel cells.

Corvus Energy will use fuel cells mass produced by Toyota, and put them together into maritime packages in its facility in Bergen, Norway.

Other companies involved are oil and gas company Equinor, shipowners Norled and Wilhelmsen, Bergen ship design company LMG Marin, the NCE Maritime CleanTech cluster and R&D institution the University of South-Eastern Norway (USN).

The project has received EUR 5.2m in funding from state agency Innovation Norway.

Wilhelmsen and Norled are already involved in hydrogen or battery vessels. Wilhelmsen has plans to build 2 hydrogen powered ro-ro vessels.

Norled is a Norwegian local ferry company, which has been operating a battery powered ferry since 2014.

Corvus' first marine fuel cell system is expected to be onboard a vessel by 2023, and the product planned to be marine certified and available for commercial delivery from 2024.

Corvus will use the Toyota fuel cell as a

building block for its fuel cell systems. It will also develop a control system combining the battery and fuel cell operation.

Corvus Energy owners include Norsk Hydro, Equinor, Shell and BW Group. Equinor is also planning its own hydrogen production facility serving maritime customers.

Corvus Energy wants to be the "leading provider of zero emissions solutions for the maritime industry," says CEO Geir Bjørkeli.

By working with Toyota, "we get the highest volume, highest possible quality and compatible prices," he says.

Building a system

When entering the maritime battery market, Corvus initially planned to develop a specialised maritime battery, but found that would be far too expensive. Instead, it uses battery cells which are mass produced and widely used. However it spends a lot of time qualifying different battery cells.

It plans to work with fuel cells in the same way, anticipating that it will develop a portfolio of different products for different segments of the market, based on fuel cell units made in mass production elsewhere, such as from Toyota.

Corvus will design the fuel cell "module", the

package around the fuel cell unit, including the software.

Corvus works with around 30 system integrator companies, which connect the fuel cell with other components, including Wartsila and ABB.

Toyota

Toyota is a leading company making fuel cell vehicles (cars). It is already selling 3,000 fuel cell cars a year under its "Mirai" brand. This is very small compared to the 10m cars it sells a year in total. But this volume does make the company one of the largest producers of fuel cells.

The fuel cell unit for cars could be used in a variety of other applications, including ships. One of its fuel cells was installed on a trial basis on a boat in the Caribbean in December 2019.

With its manufacturing scale, it is constantly improving the fuel cells, with the next generation being lighter, smaller and cheaper.

"Standard modules are the DNA of Toyota," says Freddy Bergsma, senior manager of strategy and business development with Toyota.

"When you standardise things you can create mass production, ensure the quality of the process, make it more efficient as you go along. You have better buying power to suppliers, you can fine tune your processes."

Batteries and fuel cells

How should shipping companies decide between batteries and fuel cells, for short sea use?

If using a battery is viable, in terms of being able to get access to the charging power you need, and being able to carry a large enough battery onboard, then it is a better choice than fuel cells. A battery can be charged and discharged with very high round trip efficiency, as much as 99 per cent.

In shipping, this is likely to happen for ships which make short trips and spend a lot of time near the shore – such as short distance ferries.

If the hydrogen itself is generated by electricity, such as from renewables, the hydrogen plus fuel cell combination is much less efficient than a battery. An electrolyser (making hydrogen from electricity) is 60-80 per cent efficient, and a fuel cell (converting hydrogen to electricity) is 40 per cent efficient. So 'round trip' efficiency is 30 to 40 per cent, compared to 99 per cent for a battery.

The question is more complicated if the hydrogen is being generated by reforming of methane, with the CO2 being captured. The hydrogen will be cheaper to produce this way, but we don't yet know how much cheaper. Some people may prefer purely renewabable generated power, if that is available.

But batteries have a big disadvantage over hydrogen fuel cells, in that they are expensive, heavy, use rare metals to manufacture, take a long time to charge, and only last a limited time. Extensive research is underway to improve all of these factors, but only making incremental progress.

The same pros and cons apply in the battery vs fuel cell debate for cars.

Shipping companies may also consider which parts of the world hydrogen is available. For now, the best supply is in Norway, Rotterdam, Amsterdam, California and Japan. Electricity supply does not have this constraint.

On ships, if the fuel cell is providing most of the propulsion power, a battery may additionally be used to provide "surge power", acting as a shock absorber to the fuel cell in case a large energy current is needed, such as when going through heavy waves.

Another issue to consider is whether the hydrogen is compressed or liquefied, to get an energy density high enough when it is stored. Liquefying hydrogen is more expensive, both for the liquefaction process and the tank, but achieves a much higher energy density. So the answer may depend on how often you are able

to get to a hydrogen supply to fill the tank, and how much hydrogen you will need in between.

Combustion engines vs fuel cells

The question probably most relevant to tanker operators is whether, in a decarbonised era, they would be better sticking with combustion engines running decarbonised liquid fuels like ammonia, fuel cells running hydrogen, or fuel cells running ammonia.

For existing vessels, with standard engines, they would probably be better off using decarbonised fuels through that engine.

For now, the highest recorded efficiency of a maritime combustion engine is 52 per cent. A fuel cell will generally get efficiency of 40 to 60 per cent of hydrogen to electricity, and an electric motor generally 85 to 90 per cent efficient. So fuel cell plus a motor would be between 34 per cent and 54 per cent efficient.

But there is much more scope for improving the efficiency of the fuel cell and motor, because it is much less mature technology, says Kristian Eikeland Holmefjord, EVP & Project Director, Fuel Cells at Corvus Energy.

Combustion engines are currently cheaper in terms of cost per kw installed, but fuel cells should get cheaper as manufacturing scales up, he says.

A further issue is which sort of fuel cell to use. Corvus is developing a type of fuel cell called Proton-exchange membrane (PEM), which runs on hydrogen. This fuel cell cannot be used for ammonia.

But it is possible to run ammonia through a different sort of fuel cell, called a solid oxide fuel cell (SOFC). This would potentially give the maritime industry the advantage of being able to use the same fuel (ammonia) in both combustion engines and fuel cells, so have a simpler fuel supply infrastructure.

Another issue to consider is that if future tankers are designed to be electrically powered, this could create more options – there are many different ways to generate electricity.



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StormGeo – hands on fleet performance

Maritime decision support company StormGeo has set up "Fleet Performance Centres" in Hamburg and Singapore to provide hands on support for decisions about vessel performance. Here's how it supports tanker operators

aking decisions about vessel performance is extremely difficult, involving a mixture of data gathering, analysis and domain expertise. It is very difficult to do with software alone, perhaps impossible.

Maritime decision support company StormGeo has set up Fleet Performance Centres in Hamburg and Singapore, where its consultants can provide hands on decision making support to tanker operators.

The performance centres were developed following a tie-up with DNV announced in February 2019, connecting DNV's ECO Insight and Navigator Insight solutions with StormGeo's Fleet DSS and ship reporting solutions. The tie-up offers services under the StormGeo name. The recently launched s-Insight analytics platform combines the best of ECO Insight, Navigator Insight and Fleet DSS with more than 4000 vessels being served.

As well as advising on fleet performance decisions, StormGeo offers route advisory, navigation planning and onboard route optimization under the s-Suite umbrella.

The Hamburg Fleet Performance Centre is led by Erik Heller, who has been working with DNV providing performance management services since 2011, and before that sailed on container ships.

Currently he leads a team of 6 people offering fleet performance management services for European and US customers. There is another team of 5 in Singapore looking after Asian customers.

The staff are naval architects and experienced seafarers, who have served onboard tankers, container ships, bulkers and cruise ships. Much of the advice is provided directly to crew themselves, and they find the advice easier to trust when they know it is coming from a former seafarer, Mr Heller says. It also means that the Performance Centre staff and the crew can communicate much better.

Around a quarter of the vessels being served are tankers.



Erik Heller, head of StormGeo's Fleet Performance Management Center Europe with Madeleine Engelhardt, s-Suite Product Manager, StormGeo

The largest clients have some 500 ships, and may have their own vessel performance specialists in house, but use the StormGeo service to support their data management and reporting. Already 70 LNG vessels are served in a growing LNG market.

The smallest clients have just one ship, in one example an Estonian operator of an ice breaker. They use StormGeo for a full service of gathering, storing, interpreting data, making regulatory reporting, and supporting decisions.

Format of advice

The emphasis is on supporting the shipowner's decision making, not to try to actually make the decision.

The communications with shipping companies is designed to be as easy to use as possible, such as with a single e-mail arriving in the morning of a person's working day, giving them advice as to where their attention should be given.

Sending an e-mail once a day is usually enough. The alerts can also be viewed on a dashboard, but e-mail can be most convenient, since that is the tool people are usually using for their main work anyway, Mr Heller says.

Dashboard tools can be made available

to customers, which allow them to delve deeper into the data if they want to.

The advice can be specific to a ship or fleet, and different advice can be sent to owners, technical managers and the ship. E-mails are only sent if there is useful advice to share or action suggested.

Sometimes clients want to be warned in the event of specific situations. For example, one client wanted a warning e-mail if a certain boiler was running, unless the vessel was in an ECA zone, or certain other exceptions.

As well as sending e-mails, StormGeo sends out monthly/quarterly reviews. It also sends results from ad hoc investigations into different issues or claims.

Clients might want data on various "performance" metrics over a certain period of time. The most requested metrics are speed and fuel consumption, but shipowners may also want data about the vessel boiler operations, auxiliary engine, main engine cylinder oil, lubricants, vessel's trim, and the hull and propeller performance.

Generating more specific advice about what should be done differently is very tricky. It involves knowing what the ship is currently doing, and then knowing what the ship could be doing which might be better, and then having the ship trust in the advice which you give.

Analysis

The data analysis is typically based on comparing current performance to a "baseline" description of what you expect the performance to be, Mr Heller says.

This baseline can be the performance specified in the charter party, such as for speed and fuel consumption. For example, a vessel may be supposed to do 12 knots under the charter party, but it is only doing 11.

Tanker charterers may make stipulations about boiler usage for tank cleaning and inerting, or how much fuel should be used to heat the cargo so it can be discharged.

There is increasing interest in monitoring consumption of cylinder oil, which is burned in each engine cycle, to make sure it is at the expected level.

The analysis can also compare current operations with the best possible operations given the conditions. To give an example for container ships, a vessel may have many refrigerated containers and be crossing the equator, and so has 4 auxiliaries running to generate enough power for the cooling. But as the vessel goes to cooler latitudes, it could generate sufficient power from 2 generators, but the crew do not realise.

It can be useful to analyse data for a whole voyage after it is complete, for example, to see if it had the right number of auxiliary engines in operation bearing in mind the maximum amount of power which was needed.

It is also useful to do a periodic analysis of fuel consumption in the boilers, and the use of cylinder oil and lube.

StormGeo's staff analyse data themselves, using the company's own software tools.

In the early days of running the centre in 2016, making a review of one ship could take a whole morning, Mr Heller said. But now it is possible for one person to monitor 300 vessels, taking a daily look at all of them.

The centre currently manages 1500 ships daily, but is anticipating a huge growth, with a target of 250 vessels per consultant.

By comparison, many performance analysts in shipping companies struggle to manage 10 vessels with one person, without access to StormGeo's specialist software tools and expertise, Mr Heller says.

Regulatory Reporting

Companies are required to report emissions

data under a number of schemes, including the EU's Measurement, Reporting and Verification (MRV) scheme, and the IMO Data Collection System (DCS).

Many charterers have also agreed to submit data about emissions of their vessels under the Sea Cargo Charter scheme.

StormGeo can automate this reporting, with the combination of its data gathering, its staff experts monitoring the data, and software tools. Vessels only need to report data once.

For example, it has developed an automatic tool for reporting data as required by the Sea Cargo Charter. A shipowner can check the report, make amends if necessary, and then approve it, and the data will be transmitted.

For the MRV and DCS, data only needs to be submitted once a year by the manager. For MRV it is submitted when the vessel completes the voyage it was engaged with on Dec 31st. Sea Cargo Charter is reported on voyage including ballast and laden legs.

For Sea Cargo Charter, the data is 'rolled up' for the individual charterer, and all of the vessels they are using. They probably would not deploy the same vessels all year, so this needs to be worked out.

StormGeo can support the data exchange and roll-up across multiple shipowners, if the companies involved agree.

Data gathering and management

The source of most of the data is noon reports from ships. This includes data about the voyage, the fuel onboard, and any specific event information, such as time of departure.

Getting quality data is always the first challenge when taking on a new ship. Some vessels have very poor reporting, Mr Heller says.

StormGeo provides software to be used onboard a ship for gathering noon report data, namely s-Insight | Log. The software provides a form which the crew fill in, ensuring that crew are only asked to report what is required. The report is sent back with data as an e-mail attachment, which can be automatically updated to StormGeo's system.

StormGeo has a tool to automatically check the noon reports, for example verifying that the numbers make basic sense. "These checks are not narrow because we want to give the freedom to report what happened," Mr Heller says.

Sometimes StormGeo staff will ask crew direct questions about something from their

forms which doesn't look right.

The noon day reports generally provides sufficient data to support the shipowner's decision making, Mr Heller says.

To handle continuously provided data, such as from sensors, is a data management task in itself, he says. There can easily be a lot of data "noise", for example engine power going up and down, which needs to be removed. It can be more use for analysis if aggregated to hourly or by 24 hour.

Storm Geo keeps all the data in a managed system, so it is easy to answer questions later, such as whether a vessel was going at 12 or 12.5 knots, if a discussion arises with a charterer.

Hull performance

There is a special service to help shipowners manage hull performance. This can be based on the performance of the hull during the sea trials, or its theoretical performance based on computational fluid dynamics (CFD) analysis.

By comparing the theoretical required power, with the actual required power, and making some corrections for weather or changing viscosity of water by temperature, you can calculate the "performance loss" caused by the hull. This might be fixed by a hull cleaning or new coating.

The analysis is made periodically, such as monthly, rather than daily.

Weather routing

StormGeo offers weather routing services from a separate team under s-Routing. They can plan the best route for the vessel for the whole sea passage, to have the most cost-effective route while prioritizing crew safety. More than 60,000 routes have been advised to ships in 2020.

StormGeo looks the whole route ahead, to see if the vessel is predicted to pass through a storm, or high waves, in addition to other weather conditions that may affect the safety and performance of the passage, such as ocean currents, sea temperature, winds, swell, and ice.

The consultants pay special attention to a vessel which is (for example) close to a cyclone, or in a cyclone danger region, like offshore central America, considering vessel specifications such as vessel type, age, stability, cargo, and speed.

STS transfer developments

Direct ship to ship transfer of cargo (STS transfer) is a growing business for some – and a way to do illicit operations for others. It appears to be on the increase – although safety and legal concerns continue

hen you need to move cargo from one tanker to another, doing it directly ship-to-ship can be much less costly than pumping it from the tanker into a landside tank, and from that tank into another ship.

For tanker operators on the 'dark side', A STS transfer can have its advantages if you want to do illicit operations, such as to avoid sanctions, because you can do it mid ocean.

For all operators, there are safety concerns, particularly when people need to be moved from one vessel to another by crane. There are legal complexities, with a separate captain in charge of each vessel, and a further "Person in Overall Advisory Control".

There are technical challenges, keeping the fenders in the right place (which keep the ships safely apart), and keeping the hoses in the right place (which keep the ships together).

Weather conditions can make it more dangerous, so doing a ship-to-ship transfer within a port, but not actually berthed, can make a lot of sense.

One of the biggest risks is transferring personnel. Readers may wish to familiarize themselves with OCIMF's information paper "Transferring Personnel by Crane Between Vessels", published in 2018.

It noted that personnel have been transferred by crane from offshore vessels to offshore oil and gas platforms for many years, under well established guidelines and regulations, including requiring certification of the crane. But similar guidance and regulation has not been available for transfers between vessels, although incidents have occurred.

It said the modes of failure are equipment failure, exceeding equipment limitations, inadequate inspection or testing, inadequate training / planning / preparation / communication, vessel interference with the transfer equipment, and poor condition of personnel being transferred (such as illness, fatigue, anxiety).

OCIMF recommended that all new tankers should be fitted with equipment certified for transfer of personnel, and operators of existing tankers should consider upgrading and certifying their equipment. It recommends that the safe working load (SWL) of the crane should be reduced to 50 per cent of the normal SWL when transferring personnel. (The document runs to 39 pages in total).

Here is a round-up of ship to ship transfer news over the past year.



STS operation at Subic Bay

Dolphins in Rotterdam

Feb 2021 - The Port of Rotterdam Authority announced plans to install new "dolphins" (freestanding structures not connected to land) along the Rozenburg Peninsula in the Calandkanaal. Vessels will be able to moor to them and do ship to ship transfers.

The Port notes that transhipment volumes at dolphins and buoys in the port increased from 16m tonnes in 2014 to 20m tonnes in 2019. With dolphins, it can use the port area more efficiently.

There are 29 berths available at buoys and dolphins in the port which can be used for ship to ship transfer. They offer a safer alternative to STS in the open sea, the port says. "Nowhere in Northwest Europe are there as many STS possibilities as in Rotterdam."

"Vessels of all sizes can moor at the buoys and dolphins 24/7, and reserving these online is easy. The berths are not only used for shipto-ship transfer but also for bunkering and for repair and maintenance activities (in the hold or hull, for instance)."

Qatargas LNG

January 2021 - Qatargas announced the first ever STS transfer of an LNG vessel involving one of its "Q-Flex" vessels.

The transfer took place in Subic Bay, Philippines (pictured left).

A cargo of 212,000 m3 was loaded onto LNG vessel Mesaimeer at Ras Laffan, Qatar, on December 18, and delivered as two separate "parcels", one via ship-to-ship transfer in Subic Bay on January 6, 2021, and the other as a delivery to Jiangsu LNG terminal, China. The customer in both cases was PetroChina.

Illicit transfer off Borneo

Jan 2021 - The Indonesian Coastguard said it had spotted two tankers making a ship to ship transfer, off the west coast of Borneo Island.

The Coastguard vessel KN Marore-322 found the transfer when making a patrol. The vessels had AIS indicators switched off, but were detectable by radar.

The vessels' names were covered with cloths.

SHIP TO SHIP TRANSFER

They made no response to radio communication. This led to a decision to search the vessels.

It revealed that the tankers were MT Horse, with an Iranian flag, and MT Frea, with a Panama flag. Since the vessels did not raise their flags and had AIS switched off, they had violated their right of transit passage.

Both tankers were then escorted to Batam, an Indonesian island approx. 25km offshore Singapore.

Best practise from NZ

December 2020 - The Maritime Mutual Insurance Association (registered in New Zealand) published its "Ship to Ship Bulk Liquid Transfer Operations Compliance and Best Practise" Maritime Mutual Risk Bulletin.

It said, "Inadequately planned and controlled STS operations have resulted in numerous and costly STS incidents with associated P&I claims. These incidents have resulted in oil spills and pollution, crew injuries during mooring and unmooring operations, ship contact/collision damage and fines for breach of regulatory obligations."

OCIMF's self-assessment

November 2020 - OCIMF published the second

edition of its "Ship to Ship Service Provider Management and Self Assessment Guide".

This is a self assessment program for STS Service Providers, which they can use to assess their safety management systems against key performance indicators.

There is a minimum level (level 1) and an increasing three levels of best practise, similar to the Tanker Management Self Assessment (TMSA). The system can be used to support continuous improvement of management systems.

The new version has been aligned with TMSA 3.

A new element has been added for maritime security. Three sections have been expanded -Reliability and Maintenance of STS Equipment, Due Diligence Regarding Transhipment Locations, and STS Operations.

The Environmental and Energy Management element now incorporates a OCIMF Energy Efficiency and Fuel Management paper that was a supplement to TMSA 2.

Total innovation prize

June 2020 – Oil major Total announced that it had awarded second prize in its "Best Innovators 2020" competition to a new design for a "Cargo Transfer Vessel". This vessel provides support when transferring oil from a FPSO to a large export tanker, such as a suezmax or VLCC.

It provides an alternative to dynamically positioned shuttle tankers, which are the only other alternative, when exporting oil from FPSOs in difficult sea conditions. And it also reduces the number of steps needed, since the oil does not need to be transhipped twice (once to the shuttle tanker, and once to the long distance tanker).

The distance between the FPSO and tanker can be increased from 150 to 400 metres.

The Cargo Transfer Vessel itself was developed by Norwegian maritime technology company Cefront Technology.

It is the size of an offshore support vessel, and has a dynamic positioning system.

The hull has a special shape which allows it to function safely as a mobile buoy sitting between the tanker and FPSO. It can move with the wind and waves around a fixed point to compensate for weather conditions.

The vessel has three back-up pumps. There is a load collector on the side of the vessel.

The vessel was put through a 6 month pilot project offshore Brazil, in the Lapa deep water field of the Santos Basin, starting in April 2020. This followed a pre-qualification process and trials in the East China Sea.



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