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# THE MARSHALL ISLANDS REGISTRY

Port State Control Detention Trends (%) Marshall Islands Liberia Panama 0.74% 1.11%\*\* 1.03%\*\* 2.32% 3.09% 3.14% 1.52% 2.22% 4.78% 4.23% 8.03%\*\*\* 6.30%\*\*\* USCG Tokyo MoU Paris MoU **AMSA** 

\*\* Liberia and Panama are targeted for additional port State control (PSC) examinations by the USCG for having a detention ratio "between the overall average and up to two times the overall average."

Sources: 2018-2020 Performance Lists Paris MoU, the 2020 Tokyo MoU and USCG PSC Annual Reports, and the 2018-2020 AMSA PSC Annual Reports.

\*\*\* Liberia and Panama have exceeded the overall AMSA average detention rate over the three years from 2018–2020.

nternational Registries, Inc. <u>naffiliation with the Marshall Islands Maritime & Corporate Administrators</u>

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# What's on the horizon for tankers?

The complex demands from regulators, financial institutions, charterers, and other industry partners, "creates a puzzle for every tanker operator," said Vassilios Kroustallis, Europe Regional Business Development Vice President, ABS, speaking at a summer webinar organised by ABS, "What's on the Horizon for Tankers".

here is no obvious choice yet on which fuel will prevail in the future. Practical carbon free solutions are not yet readily available.", said Vassilios Kroustallis, Europe Regional Business Development Vice President, ABS, speaking at a summer webinar organised by ABS, "What's on the Horizon for Tankers".

"New technologies are being developed to supplement or replace traditional generators onboard. Some forgotten technologies are being revisited with a fresh approach, for example wind assisted propulsion. We're participating in several projects relating to batteries and fuel cells, and how renewable sources of power such as wind and solar could be utilised on board vessels."

Much work is going into improving tanker designs for higher efficiency, with a secondary goal of making a design as flexible as possible, since the dominant fuel of the future is not yet known.

Tanker operators are looking at improving hull coatings; using under-hull air lubrication; optimising the hull, rudder and propeller; improving the aerodynamics of the superstructure; and finding ways to recover waste heat.

Operators of larger tankers (Suezmax / VLCC) are looking at a "fuller forward" hull form with a straight, bulb-less stem profile, Mr Kroustallis said.

Tanker operators are looking at increased

use of higher strength steels, to reduce steel weight. They are looking at full spade rudders, which convert a higher proportion of propeller thrust into "lift" than a conventional semi-spade rudder.

We have already seen the first ever ammonia ready Suezmax. There is already a VLCC compliant to EEDI phase 3 under construction, he said. Phase 3 is expected to come into force Apr 2022. We have already seen dual fuel VLCCs, which can run on either conventional fuel or LNG. "These are examples of what we can expect in the future," he said.

IMO plans to evaluate its sustainable goals in five years' time (2026). "No-one can precisely predict how the market will develop in years to come," he said.

"Tankers will not only use alternative fuels for propulsion, they will also carry them as cargo. A new need will appear for tankers suitable for carriage and distribution of alternative fuels around the world," he said.

# What's on the commercial horizon

"It is a tall order for anyone to stay on top of commercial activities while handling all of these [climate] challenges," said Peter Sand, Chief Shipping Analyst with shipowner association BIMCO, speaking in the ABS webinar.

Tanker earnings in the crude oil spot

market are at loss making levels. In product tankers, there is a "somewhat similar picture," he said. "Our expectation for 2021 is loss making freight rates on average, a seasonal uptake in the later part of the year."

In coming years, the crude oil tanker fleet is expected to continue growing at 1-2 per cent a year, and "a little less than that" for product tankers.

"VLCCs are taking up the lion's share of orders being placed, about two thirds of all tanker orders by million dwt."

Exports of crude oil from the US, which have been happening since late 2015, is a "mainstay in the [tanker] market," because it "delivers the longest tonne miles," he said.

There is a re-emergence of Chinese imports from the US, which is "a much welcome development" for tanker operators. "That trade was coming to a halt during the peak of the trade war between the US and China. We need those trade routes to keep VLCCs busy."

In 2020 we saw a rise in Russian exports, such as from the Black Sea and Baltic Sea towards China, much of it going through the Suez Canal, but some of it going around the Cape of Good Hope (South Africa).

China also has a desire to use its own vessels for import. "That is constantly putting pressure on independent owners and operators," he said.

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# Kpler, BIMCO and Gibsons on tanker recovery

Kpler, BIMCO and Gibsons shared their views on whether tanker markets are on the road to recovery, on a Jul 27 webinar organised by Reuters Events

re tanker markets on the road to recovery, and what are the biggest factors which will have an impact from now? Speakers from commodity data and analytics company Kpler, shipbroker Gibsons and shipping association BIMCO shared their thoughts, in a July 27 webinar organised by Reuters Events.

Matthew Wright, senior freight analyst with commodity data and analytics company Kpler, said that the answer begins by looking at demand for crude oil in China.

We saw a steep growth in Chinese crude inventory in 2020, which has been declining so far this year, but "there's still quite a way to go. We've not seen a huge draw down. Stocks have been rising even with imports at relatively low level."

There are questions over how much oil China will demand in future, with many independent refineries cutting the amount of crude they process.

There are signs that the Chinese government is looking to crack down on oil imports, partly to achieve climate goals.

High land inventories "are the enemy of the tanker sector," he said. If the market gets 'backwardated' (with futures prices lower than present day prices), companies choose to take supply from their stores, rather than new deliveries by tanker.

However with inventories getting drawn down, there will come a point where refineries are forced to buy seaborne oil.

# **Oil supply**

The need for crude tankers is also driven by the global supply of oil. Here we have only seen "relatively modest" increases up to July 2021, then there was an agreement by OPEC to increase production by just 400,000 bopd.

It is not yet certain whether this oil will be exported, it may be used by Middle Eastern countries such as for power generation.

So the shipments in 2021 "is not the most exciting number. By the end of the year loading should be higher than where we currently are. For next year - a higher average for the year, which is what the crude tanker market needs.

The main contribution to the increase will

come from OPEC production. "There will be some increase in [US] shale growth - but not necessarily high as it would have been a couple of years ago."

## **Clean shipments**

In terms of clean tanker shipments (refined products), looking at medium range tankers (MRs) "which account for over 50 per cent of clean product flows."

Mr Wright sees this in two separate markets, West and East of the Suez Canal.

Before the pandemic, demand for MRs East of Suez was increasing, but collapsed during the pandemic, with some spikes from vessels used in floating storage.

Southeast Asia is a "huge net importer" of products, including products refined in the Middle East and China, Mr Wright said. "In January to March we saw pretty steady growth."

The concern with India is the high Covid numbers, and we don't know when it will come out of the current spike in Delta Covid cases.

Chinese product exports "really look like they are going to be on the decline for a little while. We're expecting to see export quotas slashed quite significantly. It may be only 40m tonnes, 20m tonnes less than last year," he said.

"Whether that's around Chinese governments" ambitions around energy transition or their wish to control independent [refineries] I'm not sure."

"China didn't have a plan on being exporter, they wanted to be self-sufficient. They just invested heavily." West of Suez, the Atlantic basin is "proving to be a bit of a stronger market for MRs."

One reason for the difference could be the differing approaches to COVID, with Western countries seeking to live with COVID, and so people still driving cars, and Eastern countries seeking to eliminate it, he said.

Looking at the long-haul flows in LR tankers, the imports of naphtha to the Asia Pacific are above 2019 levels, but East to West volumes are yet to recover. European imports are around the 2019 average, but mostly sourced from the Mediterranean and Russia on medium range vessels.

Many VLCCs and Suezmaxes are also being used to carry petroleum products.

There are VLCCs and Suezmaxes going to West Africa, loading cargo offshore, and going to South America. "That's eating a lot of MR and LR trade - that would otherwise come from Middle East and India. It is definitely opportunistic because of the weak crude [tanker] market."

Floating storage is much reduced now, he said. The volume in storage has reduced from 200m barrels at the peak to 70-80m now, although still above pre-pandemic levels of about 50m.

# Peter Sand, BIMCO

Peter Sand, chief shipping analyst with BIMCO, noted that tanker freight rates have been lossmaking over the past year.

Time charter rates for medium range tankers are at breakeven levels. "If we're seeing any MR time charter deals right now - they are not



Screenshot from the Reuters webinar. Top row: Matthew Wright, Kpler; Paul Chapman, Reuters. Bottom row: Richard Matthews, Gibsons; Peter Sand, BIMCO.



# **OPENING**

profitable - they basically cover the cost. We see no time charter for crude oil VLCCs.

"The indications are that no-one is a rush to move any cargo soon."

"We see indications from brokers, the oneyear time charters for VLCCs are in loss making territory even with a scrubber onboard."

The cause of weak markets goes back to the early 2020 disputes in OPEC, which led to big growth in oil coming onto the market, and a spike in demand for tankers.

Tanker operators got "spectacular earnings" in the first half of 2020, particularly the second quarter, at one point earning \$100k revenues in excess of costs on a vessel.

Owners and investors built up war chests. But this may be preventing them from needing to scrap vessel today, leading to oversupply in the market.

But the early 2020 demand will not be repeated very soon.

On the issue of high levels of oil stocks in China, Mr Sand said that it is not certain whether they are considered strategic petroleum reserves, an indicator of a fundamentally growing demand, or to ensure that refineries have no interruption to supply.

Brazil to China is an important long haul VLCC trade, Mr Sand said. But exports in May 2021 were "horribly low", June is "somewhat in recovery mode". For the first half of the year, exports to China were down 10 per cent. With such long distances, this "puts a lid" on freight rates.

Brazil and China have "a longstanding relationship, but a very one-sided one, where China says 'jump,' Brazil says, 'how high.'"

To get the tanker markets back up, "we need the long hauls, we need China to take from North Sea, from the Black Sea."

COVID is a major factor in future oil demand. For China and India, which have driven a rise in oil demand over the past years, there are questions about whether future waves of infections will stop the current recovery in demand.

For Europe and North America, "we're not going to see pre pandemic levels being breached until 2023."

Long term oil demand may have already peaked in Europe for climate reasons and could have peaked in North America as well.

In South America, COVID hasn't impacted shipping so far very much.

## Scrapping and newbuilds

BIMCO's Peter Sand noted that the tanker scrapping market is behaving unusually.

There are high scrap steep prices, and too many vessels for the cargoes available, but tanker owners are not scrapping ships.

Only an "insignificant" amount of tonnage has

been taken out of the crude oil sector, and about 2m DWT taken out of the product sector.

One reason is the market for second-hand ships, which can be \$2m to \$5m more than the scrap value.

Gibson's Richard Matthews said his company has noticed many of these second-hand vessels "sail to the Caribbean and turn their transponder off – then we see them in other parts of the world and see they've been doing Venezuela and Iranian crude." They are later sold for scrap.

"The freight rates offered for this illicit trade, we understand to be, 10 times the current market. It's attractive for people who want to do it."

There are 55 VLCCs planned to be added to the fleet in 2022, although they are probably going to carry clean products on their first voyage, he said. But then they will be carrying crude, and this won't help rates. "We're probably not going to see the same number of vessels taken out of the market.

However, Mr Matthews noted that tankers will need to be scrapped eventually, and with very few tankers scheduled for delivery in 2023 and 2024, there may be good news for freight rates along the way.

"So at the end of 2023, we've got world demand above pre pandemic levels,

no new tankers, the tankers which haven't been scrapped will eventually have to be scrapped, you'll suddenly have a much tighter fleet position.

It will probably be around 2023 before they start generating some decent income again."

## Long term demand

In terms of longer-term predictions for oil and tanker demand, "I think we are in a safe house for 2025 and also for 2030 to some extent," Mr Sand said. "I would not be afraid that oil demand evaporates beneath our feet."

China has announced plans for peak carbon by 2030, although that is likely to be much about coal.

"That whole climate agenda needs time to get into gear, put that transition thoroughly on the rails. We're still very far away from that."

The growth in renewable energy is not even enough to satisfy the growth in demand, let alone take existing demand away from fossil fuels.

"I see a huge demand for energy, putting something of a cushion for shipping of fossil fuels at least into 2030, coal being perhaps the one exception."

### **Other market changes**

Richard Matthews director of research at Gibsons noted that there has been refinery construction East of Suez, leading tanker owners shifting tonnage East. But the increased car driving in the US may eventually lead to more imports by the US. Looking at jet fuel, Gibsons' Richard Matthews noted that while flows of gasoline are getting similar to pre-pandemic, jet fuel is not. And jet fuel is often transported over long distances, such as Middle East to Europe, or from Asia to the Atlantic. And most analysts do not expect jet fuel market to get back to prepandemic levels even in 2022.

In terms of jet fuel, we are seeing domestic flights in China and Europe picking up, but long haul still limited, Peter Sand added.

Speakers were asked about what it will mean for tankers if US sanctions on Iran are lifted. They said that while more oil in the market is good for tankers, it is not a net benefit if oil from Iran to China displaces oil from the Gulf of Mexico to China.

"There's a lot of very old vessels trading Iranian oil," said Gibsons' Richard Matthews. "They're only doing that because there's no modern vessels willing to do it" [due to penalties for sanction busting]/

Gibsons estimates that 10 per cent of all VLCCs, and 7 per cent of all Suezmaxes, are engaged in Iranian or Venezuelan trade. "If sanctions get lifted, those vessels will not get accepted to buyers of Iranian / Venezuelan oil. So those vessels would get marginalised and taken out of the fleet," he said.

BIMCO's Peter Sand noted that freight rates usually spike when sanctions are invoked, not when they are lifted. At the moment we are not hearing much about Iran, which could be a sign that diplomacy is working, but could lead to sanctions being lifted.

Speakers were asked if they thought there would ever be a large market shipping CO2. BIMCO's Peter Sand replied that the energy emitted when shipping CO2 could eliminate carbon benefits of a carbon capture program.

"For any significant impact on climate change, you need to capture CO2 at the origin."

There has been news about tankers being built carrying 12,000 to 20,000 of liquid CO2 to Iceland. "Perhaps that's an omen of what may come."

And while we can "paint quite bullish pictures" about the uptake of electric vehicle sales worldwide, "you need to put that in perspective of the [vehicle] fleet on a global scale."

Asked where we are on the current market cycle, Kpler's Matthew Wright said ""We should be through the worst, unless there's a sudden reversal or spike in COVID. If OPEC fall out again it might be great for tankers."

"We're at the bottom, the only way is up. The supply signals and demand signals are positive."

This article is based on a Reuters Events webinar on July 27, "Are tankers on the road to recovery". It is on YouTube here https://www. youtube.com/watch?v=4Lj64WWbSjA

# **Developments at OCIVF**

# In its May, June and July newsletters, OCIMF reported on finding a pathway with climate change, West Africa piracy government initiatives, and concerns about marine loading arm maintenance, and much more

ecently things have been quite quiet in the Middle East, but you will be aware of the terrorist attacks on two tankers over the past few days [late July 2021], Mercer Street in the Arabian Sea and Alberta in the Red Sea – resulting in the deaths of two seafarers on Mercer Street," said Rob Drysdale, managing director of OCIMF.

"Condemnation from various countries has followed and there is a real risk of further escalation in the region. I sincerely hope that the situation is not allowed to get out of control."

# **Climate change**

For climate change initiatives, "there is so much going on within this space that it can be difficult to track what has already been done, what is being done today and what still needs to be done," Mr Drysdale said.

OCIMF is reviewing what role it will take in greenhouse gas emission reductions. "We cannot be involved in everything, so we need to focus our collaboration efforts where we can best bring value for our members and for the maritime industry as a whole."

"New fuels, whether they are reduced carbon, carbon neutral or zero carbon, are going to be a big part of the solution."

"The technical challenges are huge, in fact, technical solutions have a long way to go to have any chance of catching up with the ideas for new fuels and hitting the deadlines set by IMO for 2050 let alone the aspirational targets already being discussed by others."

"One of the problems not yet fully appreciated is the potential safety impacts of these new fuels on bunkering, storage and handling onboard."

OCIMF has joined a "Safety of Future Fuels" working group in May, which was launched by the "Together in Safety" coalition (see https://togetherinsafety.info/). This group is doing a Strength, Weakness, Opportunity and Threat (SWOT) analysis of various fuels, and risk assessments.

# West Africa piracy

OCIMF noted that the first meeting between the Nigerian government and the Inter Regional Coordination Centre (ICC) Yaoundé was held on July 14, as the "Gulf of Guinea Maritime Collaboration Forum / Shared and much more

Awareness and De-confliction (GOG-MCF/ SHADE)."

The Yaoundé Interregional Coordination Centre in partnership with NIMASA (Nigerian Maritime Administration and Safety Agency) and the Nigeria Navy chaired the meeting.

"This is a huge landmark in the journey to addressing maritime piracy, kidnap and ransom in the region. There is still a lot to do, but with the collaboration of all stakeholders I am confident of success," said Rob Drysdale, managing director of OCIMF.

The Director General of the International Chamber of Shipping (ICS) made the following remarks at the meeting. "Regional coastal states are on the right track, ramping up their law enforcement, judicial processes, and military capabilities to establish maritime security in their waters.

"Among these, Nigeria's Deep Blue project is notable. It is by far the most ambitious and promising project in the region right now and has the potential, over time, to be a game changer to the fight against piracy."

OCIMF also said it was pleased about Nigeria's "Deep Blue" maritime security project. "This is a significant investment in military and law enforcement infrastructure to secure its maritime domain and address the ongoing piracy issue in the Gulf of Guinea,"

"Managed by the Nigerian Maritime Safety Agency (NIMASA), the multi-agency project will significantly increase maritime security in the region. A central command and control centre based in Lagos will oversee a network of integrated assets including two special mission vessels, two special mission longrange aircraft, 17 fast-response vessels capable of speeds of 50 knots, three helicopters and four airborne drones, providing 24/7 cover for the region. These complement the Yaoundé ICC structure offering real capability to both Nigeria and the region."

"OCIMF hopes Deep Blue assets, coordinated with the activities of other navies and programmes through the mechanism of the GOG-MCF/SHADE, will seriously impact on the ability of pirate groups to prey on merchant shipping."

# **IACS** meeting

OCIMF joined an International Association of Classification Societies (IACS) meeting on Jul 19-21, for an update on progress on working groups, in the lead up to an annual "Tripartite" event in Autumn. The three parties represent shipowners, shipyards and class, discussing design, construction and operation of new and future ships.

Themes of the discussion were decarbonisation, human-centred design, design safety and digitalisation. There were updates on fire risks due to leakage from low pressure fuel pipes, and on the joint industry working group on anchoring equipment.

# **Mooring equivalency**

OCIMF has initiated and is funding a joint industry project to study the performance of mooring systems, in order to see how alternative mooring systems compare. The project is being led by research institute MARIN.

Examples of alternative mooring systems are vacuum pads and magnets. There have been growing safety concerns about conventional (rope based) mooring systems due to injuries after ropes have snapped.

"OCIMF supports the application of new technology when its safety and reliability can be demonstrated," OCIMF said.

The MARIN led project will also identify the most important data to analyse, when assessing a mooring system.

# **Root cause investigations**

At the IACS meeting, OCIMF presented an update on an IMO submission to MSC 104 to amend the Casualty Investigation Code to mandate root cause investigations.

This follows OCIMF's analysis of an investigation report into the Sanchi-CF Crystal incident (collision between a tanker and bulk carrier off Shanghai in 2018 with 32 casualties). The analysis showed a lack of evidence related to human factors were identified during the investigation.

# SIRE 2.0 inspector training

OCIMF's SIRE 2.0 training programme for SIRE CAT 1 accredited inspectors began with the first course successfully conducted from 19-23 July.

Each course consists of a segment on human factors and non-technical skills, delivered by industry experts, and has segments on technical skills as well as a focus on Ethics and Code of

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## Conduct.

Online courses are being held weekly in different time zones to facilitate the transition of existing SIRE inspectors to the SIRE 2.0 programme, which will commence on 1 April 2022.

# Website / annual report

In July, OCIMF rolled out a new website at ocimf.org. The content is now available in nine languages. "I believe it is much more intuitive than the old version and should be easy for you to navigate," said Rob Drysdale, managing director.

The 2021 OCIMF Annual Report, covering activities throughout 2020, is now available to download from the website at OCIMF - Oil Companies International Marine Forum -Annual Reports

# **Marine Loading Arm failure**

OCIMF noted that the UK's Health and Safety Executive (HSE) has issued a "Safety Alert" after a catastrophic failure of a Marine Loading Arm (MLA) at a UK terminal.

This was found to be due to lack of lubrication, leading to a failure of the pivot.

In its report, the HSE Alert referenced OCIMF documents – the SIGTTO/OCIMF Jetty Maintenance and Inspection Guide 2008 and OCIMF Design and Construction Specification for Marine Loading Arms 2019.

OCIMF is currently revising the Jetty Maintenance and Inspection Guide and will take into account immediate findings for inclusion into the revision of current guidance for MLAs, it said.

### **California berth emissions**

OCIMF has joined a workshop organised by DNV, related to their technology assessment of emissions control regulations being considered for vessels at berth in California.

The full name of the regulations is "2020 amendments to California Air Resources Board's (CARB) Ocean-Going Vessels at Berth Regulation."

Over 40 stakeholders joined the workshops, representing ports, terminals operators, shipping companies, equipment vendors, trade organisations, Classification Societies, as well as oil companies (OCIMF).

The discussion included understanding requirements for shore power technology, categorising the "novelty" level of elements involved, and identifying critical risks. OCIMF provided input on engineering, operational and safety aspects in connecting shore power to tankers. A future step will include assessing threats and risks.

### Infrastructure

OCIMF participates in a number of working

groups from the World Association for Waterborne Transport Infrastructure (PIANC).

This includes working groups on design and assessment of marine oil, gas and petrochemical terminals; design and assessment of marine single point mooring and multi point mooring facilities; design of fender systems; criteria for acceptable movement of ships at berths; mooring bollards and hooks; met ocean related risk in construction of marine works; and inspection, maintenance and repair of waterfront facilities.

OCIMF members provide expertise from the oil and gas sector, in operations, inspection and maintenance of infrastructure.

#### **Tanker Accident Database**

OCIMF encourages tanker operators to register with the Tanker Accident Database, so they can submit reports about accidents, which are then anonymised, so that OCIMF / Intertanko is only able to read about the accidents, not the company involved.

The database is operated by an independent company, MIS Marine, on behalf of OCIMF and Intertanko, but with OCIMF / Intertanko not having any access to the data collection area.

Data can only be submitted by vessel operators holding a Document of Compliance.

The way the system maintains anonymity is by having two separate digital systems. The data is entered into a first system, all information that could possibly identify a company is stripped away, and then it is added to a second system.

The data is used for statistical analysis, trending and benchmarking.

"Despite being launched during a global pandemic many companies have already registered and begun submitting data. The more companies that join them the better the data pool becomes," OCIMF said. More information is at https://www. tankeraccidentdatabase.org/

### **British Standards Institute**

OCIMF has joined the "Maritime Works" committee CB/502 under the British Standards Institute.

It monitors European and international activity in equivalent work areas, particularly Eurocodes and optimisation of UK influence.

It oversees the BS 6349 series of standards that provides guidance on the planning, design, construction and maintenance of maritime structures.

### **STS hoses guidelines**

OCIMF has a new paper, "Guidelines for the Handling, Storage, Use, Maintenance and Testing of STS Hoses." It is designed to be used together with OCIMF's STS Transfer Guide and ISGOTT. It is available from download from its website.

#### **Meetings**

The Environmental Functional Committee met on July 2, to finalise the committee environmental plan, to review progress on emerging risks, and to review recent IMO meeting briefs on greenhouse gases.

The Human Factors Functional Committee met on June 23, looking at an information paper on the human factors element for the TMSA, due to be published in Sept 2021; contributions to SIRE 2.0 including human factors training and a review of human factors related questions.

OCIMF held a meeting of its executive committee on Jun 9-10. Topics included a strategy implementation update; in-depth discussion on OCIMF's draft Environment Plan; secondee resourcing; update on SIRE 2.0 progress; 2021 financial projection versus approved budget; principal and Functional Committee updates. The next meeting is scheduled for 1 December 2021 in London.

OCIMF's Maritime Security Committee held a meeting on June 9, looking at development of OCIMF's Risk Advisory Function; completing new guidance for the Employment of PMSCs (Private Maritime Security Contractors); reviewing the Indian Ocean High Risk Area.

The Programmes Committee met on June 15, making decisions on the Vessel Inspection Programme (VIP) project that will deliver SIRE 2.0, new criteria for becoming a Programme Submitting Company, review of work experience requirements for applicant inspectors, launching of the revised Programmes policies, procedures and user guidance, and launching of the Programmes Participants Code of Conduct.

## **Barge inspections**

The European Barge Inspection Scheme (EBIS), which has been running by oil and chemical companies since 1998, was transitioned into OCIMF's Ship Inspection Report (SIRE) programme on 1 January 2021, to create a single barge inspection scheme within Europe.

There has been an "OCIMF-EBIS Transition Taskforce" and a "BIQ5-EBIS9 Inspection Working Group" managing the change.

Half of EBIS members are now approved by OCIMF to commission IQ-EBIS9 inspections within the SIRE programme.

This article is a summary of OCIMF's newsletters for May, June and July 2021. The full text is on **ocimf.org** 

# The Sea Cargo Charter – charterers driving decarbonisation

The Sea Cargo Charter, an agreement by a group of charterers to calculate and report emissions from chartering activities, is building its footprint in shipping, as tanker operators are asked to provide data for all 2021 voyages

he Sea Cargo Charter, an agreement by a group of charterers to report emissions from chartering activities and track alignment with IMO goals, is getting an increasing footprint in the shipping industry.

The current status was presented in a Connecticut Maritime Association (CMA) forum webinar on May 5, with speakers from Cargill, Anglo American, Dow Chemical and Maersk Tankers. The webinar was supported by Global Maritime Forum and Marine Money. (The full webinar is on YouTube see link below).

As of May 2021, the Charter has 22 signatories. Of particular interest to the tanker sector are charterers Trafigura, Equinor, Total, Gunvor, Shell, Occidental, and Dow Chemical. Also, tanker operators Maersk Tankers and Norden are signatories.

On the face of it, the Sea Cargo Charter is only demanding tanker operators do what they are already required to do, decarbonise at a rate in alignment with IMO's targets.

But it also provides a structure for charterers to demand information about emissions from their voyages, and for charterers to discriminate between tanker operators on the basis of emissions. Sea Cargo Charter also aims to drive standard methodologies about how maritime emissions are measured and added up, something webinar participants said is sorely needed.

Another benefit is that Sea Cargo Charter demonstrates to regulators, and others, that charterers are getting involved in maritime decarbonisation, he said.

Companies are not allowed to use offsets to reduce their reported emissions. "If people want to do offsets that's fine, but its outside the Sea Cargo Charter reporting," said Cargill's Jan Dieleman.

The group has a relationship with the Poseidon Principles, an initiative supported by 27 banks, who undertake to measure the climate intensity of their shipping (loan) portfolios, and assess their alignment to "established decarbonisation trajectories" (such as the IMO's). Poseidon Principles and Sea Cargo Charter have the same office address in Copenhagen on their websites, as does Global Maritime Forum.

# Cargill

Jan Dieleman, chair of Sea Cargo Charter, and head of Cargill's Ocean transportation business said that the purpose, from a charterer's perspective, is to have a tool to learn about



Screenshot from the Sea Cargo Charter webinar. Top row: Raghav Gulati, Anglo American; Johannah Christensen, Global Maritime Forum; Jim Lawrence, Marine Money. Bottom row: Jan Dieleman, Cargill; Lance Nunez, Dow Chemical; Eva Birgitte Bisgaard, Maersk Tankers

the emissions from the ships it charters. In other words, to drive transparency. "Hopefully that transparency is going to give increased accountability going forward," he said.

It will also drive efforts to obtain emissions data in a standardised format. "In Cargill we've been looking at emissions for the last 5 years. The more we looked at it the more complicated it became," he said.

"We needed something standardised where we all can say, these are the emissions, this is how we're going to measure it, this is how we're going to disclose all this information."

One of the biggest challenges has been "getting data flowing," he said. "I don't see a lot of people unwilling to do it, but people are a bit uncomfortable with it. We have to explain what it is."

"What we have today in Sea Cargo Charter is not the end state. There's a lot of things that still need to be tackled."

In future we may see more verification (checks on the data), Mr Dieleman said.

"Decarbonisation is going to be the biggest challenge and opportunity in the next decade. I urge people to turn it into business models and new revenue streams, not see it as a problem or headache."

Cargill is described as a "global food corporation" on its Wikipedia page, and "the largest privately held corporation in the United States in terms of revenue", with \$114.7bn revenue a year.

# **Anglo American**

Raghav Gulati, Safety, Sustainability and Technical Operations Manager - Shipping at Anglo American, said that the company is using the Charter as its "vehicle to calculate emissions and measure our alignment to the IMO decarbonisation trajectory."

With this standard, transparent framework, you an have confidence in the accuracy of the numbers, and then track if your decarbonisation trajectory is on course, he said.

# DECARBONISATION

Anglo American is described on Wikipedia as a multinational mining company, the world's largest producer of platinum with 40 per cent of world output, and a major producer of diamonds, copper, nickel, iron ore and coal.

In time charters, gathering data is "relatively easy", because the charterer is in control of the voyage. "But when it comes to voyage fixtures - it becomes a challenge to get that data," he said.

"We've observed a lot of hesitance around sharing the data from counter parties. That's mainly because they are unaware of the principles. Having the discussion [about the reasons for needing data] with the stakeholders is proving very effective to get the data flowing transparently."

Anglo American has done a lot of work with its internal commercial teams, so they can understand the requirements, and convey them to shipping companies in chartering discussions. The contract should specify the data which shipping companies are expected to provide, he said.

How you manage the data is just as important as whether or not you obtain the data, he said. "That data can get fairly overwhelming at times."

The company has a target of only working with measured data. "We expect that soon we can get that 100 per cent target of getting the factual data and we don't have any assumptions."

It is important to validate the data coming in. "If it comes to be totally inaccurate, that data has no value for us. If the numbers are not correct we can reach out to counterparties to have it counterchecked."

Shipping companies should see the IMO's decarbonisation target "as an industry target, not an owners' or charterers' target. It is a shared responsibility," he said.

## **Maersk Tankers**

Eva Birgitte Bisgaard, chief commercial officer with Maersk Tankers, said that in the early days of maritime decarbonisation, the company had felt "we were standing a little bit on our own" as a shipowner supporting decarbonisation.

"When we first saw the initiatives coming from Cargill, we were right there."

It was the ambition level of Sea Cargo Charter "that made it super attractive for us," she said. Also, "it was bringing a lot of the different parties together."

"I think the transparency that we are trying to drive through the Sea Cargo Charter will really help us. It's going to direct us to how we look at emissions."

Maersk will file its first report in the beginning of 2022, based on data collected over 2021.

Gathering the data is already proving a complex problem, with 230 vessels each providing about 100 pieces of data a day in their noon reports. That adds up to several millions of pieces of data which will go into the final report.

But as a result, Maersk gets a much clearer idea of where its emissions are.

The data calculation methods are just as important as the data gathering, she said.

Maersk is now taking emissions into account when choosing which vessels to allocate to which cargo, perhaps with more efficient ships doing longer routes, she said.

It also expects to use the data in discussions with vessel owners, showing them what their emissions currently are, and how they might be reduced. Maersk Tankers is a commercial manager of a pool of tankers, working with 30 different pool partners (owners).

# **Dow Chemical**

Lance Nunez, Global Marine and Terminal Logistics Director with Dow Chemical said that its participation in Sea Cargo Charter "has started driving increased focus on the respective emissions and ESG programs of our carriers."

It would like to have data for all of its 2021 voyages, to include in its first report in 2022.

Dow is "one of the world's biggest chemical producers and one of the world's biggest speciality chemical shippers," he said.

"Emissions reductions are now prominently featured in our supplier relationship management discussions," he said.

He said that these discussions have so far been welcomed by most of the company's core carriers. "They have already got a long list of reduction actions. We still have plenty of work to do."

"The general sentiment from our carriers has been that [they] understand that emissions reporting is inevitable."

"Some carriers have not been so enthusiastic, but they seem to be more the exception than the rule. It usually stems from not understanding what the Sea Cargo Charter is about. After explaining that further, they become more receptive."

"What's seems most scary for them is the lack of standard methodology for data gathering and calculation. If reporting is to be sustainable, it needs to be straightforward and standard across their customer base. Sea Cargo Charter offers an opportunity to standardise."

Both shipping companies and charterers have a role to play in reducing emissions, he said. "It is a global issue impacting all industries, not just ours".

Shipping companies can use the data they collect for their own purposes.

"This is a very efficient and effective way to collect that data, that at the end of the day, we will all need."

"It is not a spectator sport. we need everybody at the table bringing their best solutions. Ask yourself, what are you doing to be part of the solution."

One challenge for parcel tankers, Mr Nunez said, is that the voyages do not have a definite start and end, with parcels being discharged at different times and places. "Vessels are typically not fully empty before they start loading the next voyage."

It is working on a methodology for calculating emissions from parcel tankers, with a certain amount of the emissions allocated to each cargo.

"We work in a dynamic industry with a lot of variation and a lot of complexity and global consensus on anything is difficult," he said.

"This is the first iteration of Sea Cargo Charter and it's a great start.

But we have a lot left to learn, we have a lot left to do."

# **Commercial decision making**

A major benefit of Sea Cargo Charter is that it enables emissions to be taken into consideration as part of commercial decision making, rather than emissions data only being seen by operational staff.

This is a "huge step forward," Mr Dieleman said. It means that for reducing emissions overall, "you're going to be in a much better place much faster."

Dow's Mr Nunez agreed that the decisions about vessel chartering have been made by cost and service quality until now. "Going forward it is quickly becoming service, cost and sustainability."

Cargill also uses the data in its consideration of which ship is best for which cargo. For example, a larger cargo volume may have lower emissions if it is moved on one large ship rather than two smaller ones.

"There's a lot of things which will spin off from this."

## Challenges

When creating the Sea Cargo Charter, there was an effort to find the right balance between accuracy and pragmatism, Mr Dieleman said. Or in other words, getting completely accurate data would be an impractically large task. "We tried to avoid being pulled into all kinds of rabbit holes."

Mr Dieleman was concerned that the Sea Cargo Charter reports would end up being used to make a poorly informed league table. While discriminating between vessels on emissions may be one of the ultimate goals, it should only be done together with full understanding

# DECARBONISATION

of the reasons that various vessels have the emissions that they do, or as he put it, "knowing the nuances behind it."

He would prefer that the purpose of Sea Cargo Charter is seen to be to "create transparency" and "understand the drivers to reduce emissions and using that to go forward."

Maersk's Ms Bisgaard agreed, "the worse place we could end up here is by naming and shaming, that won't get us anywhere. "We're trying to bring down emissions. The important thing here is to be able to bring forth the relevant data that we need."

There will be complexities if it becomes clear that charterers are paying more money for vessels as a result of being part of Sea Cargo Charter. "

"We're going to see much more strategic partnerships with suppliers and users, having discussions on the 'green premium', who's going to pay what," said Cargill's Mr Dieleman.

Another challenge is that there is still much uncertainty about what the future fuels will be, including about infrastructure and commercial viability. "The predictability right now is super low," said Maersk's Ms Bisgaard.

# Link with IMO

There is a lack of clarity about IMO's requirements for certain vessels, because they do not obviously fit into the classification bands, said Cargill's Mr Dieleman.

"If there's 'unclarity' in IMO there's going to be 'unclarity' in Sea Cargo Charter, because we link them up."

Dow's Mr Nunez said that Sea Cargo Charter could compliment IMO's initiatives, because IMO's efforts do not take the broader supply chain, which maritime cargo transport is part of, into account. "If you are an end user you want to measure all your supply chain emissions. The maritime piece needs to fit in there. What the IMO has done so far is not ticking that box."

The decision to align Sea Cargo Charter with the IMO targets was a complex one. "A lot of participants thought the IMO target was maybe not ambitious enough," said Mr Dieleman. "In the end we did settle for IMO to have the consistency."

The IMO reporting schemes require much less granularity than the Sea Cargo Charter, which "obliges reporting on a voyage basis, so providing emissions data that we as charterers can use to make better decisions," said Captain Gulati.

Another factor is that IMO measures are focussed only on the asset and its emissions

per ton mile. Sea Cargo Charter takes in a broader range of factors into account which may affect emissions, such as how the vessels are routed, how fast the loading is, how long the ballast legs are, so how much the vessels are optimised more broadly in the supply chain. "The asset is an important piece but not the only one," Mr Dieleman said.

The Sea Cargo Charter is trying to show emissions on a voyage by voyage basis, and why they occurred, "was it the port stay, was it the speed you have, show the levers," said Cargill's Mr Dieleman.

## Geographical

Not all parts of the world have the same level of ambition in decarbonisation. "Definitely the European region is far more progressed," said Anglo American's Captain Gulati. "The Asian countries are picking up the pace, they have started to come out with their own goals."

Cargill's Mr Dieleman added, "I was pleasantly surprised, signatories are not all Western based, I was a little bit afraid of that. One of the first companies which signed up was a Chinese grain house."

This webinar this article is based on is online at https://www.youtube.com/ watch?v=IlvCKKSDKQI



# **Decarbonisation and charterer contracts**

Denis Petropoulos, Chairman of the Baltic Exchange, and a non-executive director of Tsakos Energy Navigation, shared some interesting views about how decarbonisation could be considered in contracts with charterers, in a podcast by Ship.Energy

he drive to decarbonise brings in many complexities to the contracts shipowners make with charterers.

In the charter party, you have the requirement for 'due despatch', which needs to be somehow reconciled against a requirement to minimise carbon emissions.

Then there is a need to find a way to reward shipowners for taking on the risk and expense of building lower carbon vessels. This may be easier done if the vessels are under a long-term contract.

"The cargo owner has a responsibility of ensuring the emissions from his mode of transport isn't damaging the world. If he chooses to find a vessel which is a high emitting vessel, he needs to contribute somewhere or another," said Denis Petropoulos, Chairman of the Baltic Exchange, speaking in a Ship.Energy podcast published on June 3.

"If he chooses to find a ship which is a lower emitting vessel, the consumer is receiving a lower emission cargo. The consumer can be charged for that."

Mr Petropoulos is a non-executive director of Tsakos Energy Navigation. He was also a founding partner of Braemar Tankers / Braemar Shipping Services from 1986 to 2018, and had a major role in growing the brand in Asia.

"If we slow down, emissions decrease dramatically, the CO2 is much reduced. [But] that slow speed brings in other questions - how long the cargo takes to get from A to B, how impatient the consumer is to receive it."

"If you speed a ship up, is that the owner's

responsibility for emissions or is that the cargo owner's responsibility because he wants a quicker cargo?"

On the other hand, some vessels could slow down without any costs. "I think about container vessels that will go across huge oceans at 18 to 20 knots, and then wait 2 weeks [for a berth]," he said. "There is no fine."

The requirement for "due despatch" ends up as "rush and wait".

"For the owner of those boxes, it is just free storage. But to the world, that's a strong amount of emission and a lot of wastage. Someone's got to pay for that. I don't think it should be the shipowner."

"A lot of very smart people, engineers, people who operate ships, are putting a lot of effort into trying to find a way where shipping can reduce its footprint," Mr Petropoulos said.

### **Paying for low carbon ships**

Another issue is how shipowners are incentivised by charterers to pay more money to build lower carbon ships. One pathway could be for charterers to take on long term charters, in effect paying for the ship themselves, and taking the risk on the investment. But this could be the end of the spot market.

"If cargo owners want to guarantee the availability of transportation, for a certain price, with a certain emission and fuel cost in the cargo, they may find it more worthwhile to build or acquire their own vessels. The spot market will then reduce to a smaller percentage of the market." "We will be going back in time, to the days when the Seven Sisters [the big oil companies] used to build ships to suit their trade. They would finance through a shipowner who knew how to manage, operate and work a ship," he said.

"Oil companies understood the logistics but didn't understand the mechanics of the ship."

"That continued until there was a drop in the market, there was a surplus of ships on charter to oil companies. They were basically laid up and idled."

The spot market was brought in as a means of finding customers for these surplus ships.

But then charterers found that they could get a better deal on the spot market. "They decided not to replenish with endless time charters. The spot market became their friend."

The spot market could get very expensive, or very cheap, depending on what was available at the time. It also meant that the charterer did not have to actually manage the ship.

"When the spot market drops to 20 per cent of the whole market, it can be exceptionally volatile," he said. "If spot market represents 50 per cent, which it does today, there's occasional volatilities."

Something similar is seen in the LNG market, where the bulk of the vessels are owned or on long term charter, and the spot market is very small. "When there's an opportunity the markets spike and big prices need to be paid," he said.

"I think the tanker market will be the one which experiences the greatest dizziness during the transition."



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# **DECARBONISATION**

LNG (gas from

rotting organic

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"I think that's

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# Shell's approach to shipping decarbonisation

Carl Henrickson, Head, Shipping & Maritime Technology, Innovation & Digitalisation, Shell, shared Shell's perspective about shipping decarbonisation at an ICS webinar

il major Shell plays multiple roles in the maritime industry relating to decarbonisation - a fuel provider, a vessel charterer and a vessel manager.

Shell has set up some very ambitious targets to decarbonise, together with partners, suppliers and customers, said Carl Henrikson, Head, Shipping & Maritime Technology, Innovation & Digitalisation, Shell.

He was speaking at an International Chamber of Shipping (ICS) webinar on June 2, "Infrastructure Transformation - Pathway to COP 26"

"None of this is going to happen quickly, [but] a huge mistake is to sit back and do nothing and wait for all of this to play out."

"We can move forward with LNG, its available, abundant, safe, there's a global bunkering infrastructure. If you tie that into energy efficient technologies, you start to see a reduction in emissions on ships, which is a precursor to delivering the future fuels."

# **Future fuels**

"If shipping is really going to make progress on decarbonisation we need to understand what's getting in the way of us doing that right now," he said.

"We did some work last year for Shell's shipping decarbonisation 'All Hands on Deck report'. We interviewed 80 senior leaders in industry and asked them, what is the barrier and how do we break that deadlock on decarbonisation."

"Almost 80 per cent of participants saw alignment on future fuel as being the major barrier to decarbonisation and getting going on the journey."

We may see a poly-fuel world as the outcome, where ships do not pick one decarbonised fuel but use many different fuels, he said.

Shell believes that hydrogen is likely to be the dominant fuel for the future, together with fuel cells onboard which convert hydrogen to electric power.

The safety risks with hydrogen and ammonia "are more challenging than with hydrocarbon fuels of today," he said. "As an industry we must focus on overcoming and exploring these safety challenges."

On cost, "any future fuel is going to require

serious investment. We know the costs will come down the more we collaborate," he said. We start to create economies of scale."

"We've got to look at the long term cost of production of different fuels, and weighing up the space for maturation and optimisation."

It is important for emissions to be considered on an end to end basis, he said. "We have to avoid moving emissions from one part of the supply chain to another. This is an entire system that must decarbonise, not just the ships."

"There's an immense amount of work that needs to be done on analysis and testing for future fuels to be brought to market at scale. It is going to take many years before we see a future fuel at ports around the world, and for ships to use them safely and in a cost effective way."

## Technology

In terms of technology development, ammonia, methanol and hydrogen fuels have a lower energy density than standard marine fuel oil, so they need larger storage tanks on ships, and transportation systems capable of handling larger volumes. "We also need to find ways to deliver the fuel onto ships, and develop operating practises," he said.

For hydrogen, Shell believes fuel cells will be the "enabling technology", and it is already getting involved in research. "We don't want to sit back and wait for hydrogen to be available before we get started with the fuel cell," he said.

Shell is looking to "get a number of consortiums up and running" to trial fuel cells on ships.

One project in Singapore being run by Shell is trialling the use of a fuel cell on a vessel working in a harbour. Another project, with Shell as a participant in a wider consortium, is trialling a fuel cell on a deep sea ship, initially to provide auxiliary power, together with LNG.

# LNG

"In Shell, we believe LNG plays an important role, it is the lowest emission fuel that's available at scale in the shipping sector today, it has no near rivals in this regard," he said.

Mr Henrikson was asked whether companies would get a viable return on investing in a vessel running on LNG, if it is only available for 10 years.

He replied that as we move to an era of zero carbon fuels, LNG could be replaced with bio



Carl Henrikson, Head, Shipping & Maritime Technology, Innovation & Digitalisation, Shell.

**Digitalisation, Shell.** future?" "It's going to be decades, years and years, before we see future fuels coming at scale, globally."

# **Cargoes become fuels**

With past energy transitions in shipping, to coal and then oil, the maritime industry used fuels which the vessels were already carrying as cargoes. And the same my happen in the transition to zero carbon fuels. In other words, perhaps the maritime industry could end up using fuel infrastructure which someone else has developed for onshore purposes.

This could be a much simpler way to decarbonise than the maritime sector developing a new fuel infrastructure by itself.

"Rather than go alone, let's see what happens in the other sectors and how the energy system starts to move. That creates an opportunity for shipping to get into that, become a pipeline for whatever that commodity is, and use it as a fuel. We engage with that as a co-owned solution."

The shipping industry has already been involved in a number of projects carrying hydrogen as a cargo, including one to carry hydrogen from Uruguay to North West Europe.

"We can focus on hydrogen because that seems to be the fuel that's working its way through," he said.

This article is based on contributions in a webinar organised by the International Chamber of Shipping on June 2, "Infrastructure Transformation - Pathway to COP 26". A video of the webinar is online here https://attendee.gotowebinar.com/ recording/4319285610063365391

# How will decarbonisation be financed? ICS webinar

Who will provide the funding for environmentally friendly vessels, and how will they be incentivised? One method is to try to reduce funding available to less environmentally friendly vessels, but this might backfire, we heard in an ICS webinar

mid all the talk in the shipping industry about decarbonisation, nobody has yet worked out how it will be financed and what the incentives will be.

One mechanism could be for banks to set a minimum level of environmental standards for the ships they are willing to finance.

But if this did not include every bank in the world, it might mean that other banks would be willing to finance less environmentally friendly vessels, with both the owners and the banks making more profit, because they are less expensive.

The International Chamber of Shipping held a webinar on June 16 to explore further, with representatives of banks Société Générale and Standard Chartered, and shipping company NYK. The webinar was called "Financing Shipping's 4th Propulsion Revolution -Pathway to COP 26".

The International Chamber of Shipping refers to the move to zero emission technologies as shipping's "4th propulsion revolution", following moves to sail, coal and then diesel in the past.

# Société Générale

Paul Taylor, managing director, global head of shipping and offshore, Société Générale, and Vice Chair, Poseidon Principles, said that the starting point for Poseidon Principles was that banks are in a position to make an impact on shipping, because they make decisions about which vessels to finance.

The banking sector altogether provides \$450m of "senior debt" to the shipping industry, covering 70,000 commercial vessels.

Signatories to the Poseidon Principles agree to measure and publicly report, annually, the carbon footprint of their portfolio, and compare the rate of improvement to the IMO's trajectory.

Since the launch two years ago, the number of signatories has increased from 11 banks to 27. "We expect more to follow shortly, including Chinese leasing companies and Korean banks."

"If banks can align their portfolios to support the IMO target, we will go a long way to supporting the industry's ambitions regarding decarbonisation," he said.

The first year's reporting, already submitted, showed that most banks were already misaligned with the IMO trajectory. That is to say, the vessels in their portfolio were not decarbonising at a fast enough rate to reach IMO's targets.

The misalignment was "not so much", he said. "But it shows a need for an initiative like Poseidon Principles."

The second year of Poseidon Principles ends December 2021. Covid should help keep vessels on the trajectory, if it has reduced demand for transport and pushed some vessels to be deployed differently, he said.

Mr Taylor's own bank, Société Générale, is making climate risks a central part of its lending decision making, on an equal footing to the credit risk, the ability of the client to pay back a loan.

There has been some criticism that the Poseidon Principles do not go far enough. Although when it was launched 2 years ago, some people made the opposite criticism, that it is too ambitious, he noted.

One concern is that if the big banks are increasingly focussing on only the bigger customers, it will push medium sized shipowners, such as with 15-20 ships, towards less reputable banks, he said.

"It won't work for every shipowner, and that's the way it is going forward."

"We can't force all banks to sign up. We have 27 today, we have most of the serious banks in shipping finance - apart from some of the Asian banks."

Poseidon Principles "is going to channel liquidity, capital, to those shipowners who have high standards of maritime stewardship and who want to align themselves with industry goals. It will take capital away from some of the other owners, who haven't got an ESG policy."

The Poseidon Principles should be seen as only a starting point. "No-one said, this is where they are going to be forever and you're going to see immediate impact and reaction from banks," he said.

It seems likely that the United Nations COP 26 meeting in November 2021 will set new targets for shipping to decarbonise, which will be passed on to IMO, he said. The Poseidon Committee has already agreed that if this happens, the Poseidon targets will be adjusted accordingly.

Mr Taylor said he is concerned that some climate initiatives, including climate bonds and EU regulations, could push investment out of high-quality shipping.

"My concern is the way this is drafted is going to close the door on what we have today in shipping and close the door on the transition. They are focussing on the destination of zero carbon, not on the journey we have to undertake. I think that could drive away investment from the shipping industry to other sectors."

"Investment in assets, infrastructure, not just ships, the whole value chain of shipping, is under threat."

And for the needed low carbon fuel infrastructure, "you can't just look to shipowners, or fuel suppliers, or ports, or banks."

## **Standard Chartered**

Abhishek Pandey, Managing Director, Global Head Shipping Finance, Standard Chartered in Singapore, noted that the amount of funding available to ships from traditional banks is gradually reducing.

According to his calculations, in 2008, \$350bn was available to shipping from the top 20 banks. In 2020 that was \$250bn.

There is a greater drop in Europe. In 2008 all the top 10 lenders were European. In 2020, only 50 per cent of the top 10 were European.

"We've seen in Singapore, quite a number of European banks have ceased to provide shipping financing through their Singapore subsidiaries."

A number of factors have had an impact on the lending terms available to shipping, including ESG requirements and Basel IV standards for bank capital requirements.

The loan to valuation ratio also reduced, so owners are not able to take out such a large loan for the same valuation of vessel.

One issue is that larger banks are focussing more on their top tier clients, at the expense of the rest, which is "creating a bit of polarisation in the industry."

This pushes shipping companies to



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# DECARBONISATION

alternative financing and leasing structures, with the growth of Chinese leasing companies being particularly big.

"We know Chinese leasing has taken up quite a lot of this slack, if I can put it that way."

In terms of numbers, Mr Pandey estimates that \$120bn of maritime lending was taken out of the market over 2013 to 2019. Meanwhile Chinese leasing was \$47bn in 2017, \$52.5bn in 2018, and \$60bn in 2019. There was additional Chinese investment of \$12bn in 2017 and \$16bn in 2019.

"The advent of leasing companies and alternative financing shows us there is an element of liquidity which can take this risk. But it needs to be priced right."

In a normal market situation, if there is less supply (of lending for ships in this case), prices (interest rates in this case) should go up.

Bank lending is typically at between 0 and 4 per cent interest, while leasing companies typically go from 4 to 8 per cent interest, so it means an increase in cost of capital.

"Risk - reward is often not debated," he said. "Knowing the volatility in this industry, the lurking question in banking is 'was it priced right.

Were the terms right.""

"We've seen it all before, private equity, hedge funds, coming in and burning themselves out.

Standard Chartered has played on both sides, making loans for 'senior debt' at 0 to 3-4 per cent, and also buying assets, doing operating leases, so taking 100 per cent investment risk, he said.

"When you have done both sides of it, you come to a conclusion, the lower side [of interest rates] wasn't really balanced with the amount of risk."

And only large companies with very strong credit ratings can get the lower rates.

"It is important that everybody understands, let me put it bluntly and simple. When you invest in a ship you are investing in a cyclical industry. You want all the upside, and you want to pass all the downside to a lender. Lenders are getting smart."

Mr Pandey calculates that 14 of the top 24 banks lending to shipping are now signatories to the Poseidon Principles, including Standard Chartered which "signed up a couple of months ago," he said.

Mr Pandey noted that there is still a bank sitting behind every leasing house, and if that bank is a signatory to the Poseidon Principles, that will mean the ships being leased are under its net.

Another factor is that shipowners are maybe not ready to invest in vessels which are very different. "Someone said to me yesterday, you need to be a very brave shipowner if you want to order something which is an unorthodox



Screenshot from the ICS webinar.

**Top row:** Svein Steimler, President and CEO, NYK Group, Europe; Beatrice Russ, partner, maritime, aviation and travel, Ince; Paul Taylor, Managing Director, Global Head of Shipping and Offshore, Société Générale. **Bottom row:** Abhishek Pandey, Managing Director, Global Head Shipping Finance, Standard Chartered; Espen Poulsson, chair, ICS

design."

So the money for new designs of vessel may come from unusual sources such as private equity funds, or sovereign debt funds investing in leasing platforms.

## **NYK Group**

Svein Steimler, President and CEO, NYK Group, Europe, noted that shipping is still an extremely conservative business. "We change late, we adopt late, we are a bunch of individualists," he said.

"The only way to get aligned is to get a set of rules and regulations which clearly tell us where to go," he said. "I'm embarrassed to be part of an industry which has done so little over so long to do the necessary changes."

"It took 40 years to ratify the ballast water convention."

"We are not the worst in the world, look at the textile industry which is far worse than us. But comparing one industry to another will not bring us anywhere, we need to look after ourselves."

"What baffles me, a few years ago we were all talking about SOx,NOx, particulate emissions. Today it is all about CO2. SOx and NOx and particulates seems to be forgotten completely."

NYK Line is currently renewing its fleet on the basis of "technology which is currently out there," so LNG fuel.

"we've said we will do something now. This is where I get a little bit frustrated with my colleagues around the world who say let's wait for something better, let's wait for ammonia and hydrogen. That is going to get us nowhere. It is an unserious and a conservative way of looking at our industry."

Mr Steimler dismisses the Poseidon Principles as more talk than substance, and

sees that banks are still reluctant to lend to greener ships. "I respect the Poseidon Principles. [But] have we seen much stuff? No we have not. I said, 'show me the colour of your money'. So far we have not seen much at all."

It is important that any environmental regulations are applied globally. "We are in an industry which is global. To have different rules and regulations is going to make trade hopeless," he said.

Another issue is that "the majority of shipowners have not got the financial [resources] to look into technical development," he said.

"Engine manufactures do. Large shipping companies like NYK do spend money. They are looking into ammonia, hydrogen, electricity.

But this makes it more important to "make sure that rules are channelled through one international organisation," he said.

But otherwise, people will end up sitting in different groups.

Future shipping will still have a mix of fuels, "Some old ships, some LNG, some electricity, some ultimately hydrogen and ammonia," he said.

I don't for a minute believe there will be stranded assets."

"I am not advocating to convert older vessels," he said. "There's got to be economy in this. You cannot spend millions of dollars to convert an older vessel."

"To me - when we build vessels today - it is for a lifespan of 20-25 years roughly. This issue will take care of itself."

A video download of the meeting is available at: https://attendee.gotowebinar.com/ recording/7616280077910508045



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# Wärtsilä – "let us partner with you in decarbonisation"

Maritime power company Wärtsilä believes that it can provide useful assistance to shipping companies in making their decarbonisation roadmaps, and it is willing to take on some of the risks in a partnership arrangement

hile the shipping industry is going through an "unprecedented era of change," it should not be "an era of uncertainty," said Håkan Agnevall, President & CEO, Wärtsilä Corporation, speaking at a company press event in late May.

Shipping companies should feel comfortable making decisions now. "We are quite certain of the steps which need to be taken," he said.

And Wärtsilä would like to do more to help shipping companies to make their decarbonisation decisions. "I see Wärtsilä being very well positioned in the big technology transitions that are coming," he said.

Mr Agnevall joined the company in Feb 2021. He was previously president of Volvo buses.

Maritime decarbonisation "needs to be financially viable, and have the right social dimensions. There will not be one simple solution, there will be different alternative fuels, different ways how to operate."

"Success will involve technology, including new fuel technologies, fuel flexibility, and integrating of digital solutions. And putting this technology in operation. It needs to work, it needs to have the right reliability. The people component is so important."

The reason to make changes now is that if we wait longer to decarbonise, we will have a steeper climb in order to achieve the targets, added Roger Holm, President Marine Power & EVP, Wärtsilä Corporation.

To achieve the IMO 2050 target, the shipping fleet needs to be transitioned to run on a different fuel, with about 60 to 100 per cent of shipping on a different fuel by 2050, just 30 years' time, he said.

"This is an enormous change for the industry and something which has never been done. Owners today are faced with a critical decision about the investments they make."

The uncertainty of the future landscape is



Roger Holm, President Marine Power & EVP, Wärtsilä Corporation

causing problems for shipping companies, because they don't know how to move ahead, he said.

# **Collaboration and risk sharing**

Wärtsilä is keen to work with shipping companies to "co-create" decarbonisation strategies, Mr Holm said.

This can include assessing the fleet, cross referencing every vessel against relevant indices, defining ambitions, and forming a decarbonisation strategy. This often involves "bridging the gap between reality and aspirations," he said.

Factors include the type of vessel, age, operating profile, the operator's decarbonisation ambition, risk appetite, and finances available. The regulatory requirements are not the same for all companies, and some lenders and charterers are setting their own requirements.

Successfully navigating" the decarbonisation challenge needs more than technology, it needs the right strategy. Collaborating with companies which have deep expertise in maritime decarbonisation, such as Wartsila, to help map your pathway, could be a good way forward.

"There is no silver bullet for this solution, it is a combination of different solutions that will deliver the desired outcome. This is where our know-how, knowledge and capabilities come into play."

"For us it is important to see how we can make solutions for each specific vessel," he said. "It is not any more good to say let's wait and see."

"We can identify the right solution for a single vessel or an entire fleet,

make a tailor made path to decarbonisation, specify the correct mix of technologies," he said.

"For new build vessels [the biggest issue is often] about fuel storage flexibility," he said.

# **Risk sharing**

Wärtsilä is prepared to share some of the risks of using new fuels with its customers, including making guarantees about certain outcomes for fuel consumption and emission, Mr Holm said.

"In many ways decarbonisation is .. working together with customers in a different way," he said.

"Our agreements have a proven track record of generating both expense saving [from lower maintenance costs] and emissions reduction.

One such agreement, with a cruise shipping customer, generated Eur 12m savings per year.

Another agreement with an LNG carrier fleet led to a reduced unplanned maintenance cost of 69 per cent over 2 years, with the customer gaining total benefits of Eur 14m.

Doing risk sharing around fuel and emissions is not something new for Wartsila, although projects in the past have been more centred around fuel costs than emissions.

# **Fuel options**

"Although we don't have an all-encompassing solution that would help decarbonise maritime today, we do have several which can act as a stepping stone," said Juha Kytölä, Director, R&D and Engineering, Wärtsilä Marine Power.



Juha Kytölä, Director, R&D and Engineering, Wärtsilä Marine Power

One option soon to be available is methanol fuel. Both methanol and LNG contain carbon (one carbon atom and four hydrogen atoms per molecule) and so emit CO2 when combusted, but at lower levels than standard fuel oil. But methanol has the advantage of not having a 'methane slip' problem. It is also a liquid at normal temperatures, boiling at 64 degrees C.

Wärtsilä first converted a vessel to run on methanol as a marine fuel in 2015.

For a zero carbon fuel, the options are hydrogen and ammonia.

If you are running on hydrogen fuel, you have a choice of carrying it compressed or liquefied, said Mikael Wideskog, Director, Sustainable Fuels & decarbonisation, Wärtsilä Marine Power.

The volumetric density of hydrogen is 8 MJ/litre as a liquid, about 1.5 MJ/ Litre as compressed gas at 150 bar, 2.8 MJ/litre at 350 bar, and about 5 MJ/litre at 700 bar.

For hydrogen in liquid form, you need temperatures of minus 253 degrees "which is colder than anything put on a vessel so far". That's colder than LNG, which is minus 160 degrees C.

Ammonia may be a more practical fuel, since it only needs cooling to -33 degrees C to be in liquid form. In 2021 Wärtsilä will demonstrate an engine running on ammonia, initially with a fuel which is 40 per cent ammonia blend, in a test facility in Finland. It will increase its ammonia testing over 2022.

Discussions about ammonia are just

starting, said Mr Wideskog.

A disadvantage of ammonia compared to today's fuels is the lower volumetric energy density, which means you need either bigger tanks or an increased bunkering frequency. The energy density of liquid ammonia is 11.5 MJ/litre, compared to 32 MJ/litre for gasoline.

But that's still much better than hydrogen, and without needing the energy for compression or a thick storage tank which can handle compressed gas.

We only have ammonia based on fossil fuel at the moment. It is possible for the CO2 to be sequestered into the ground rather than emitted. This is known as the "blue option", making hydrogen from gas with carbon capture, and using this hydrogen to make ammonia.

It is possible in future we will see "green" or synthetic ammonia made from hydrogen from renewable electricity and electrolysis of water, but it is not yet available, he said.

You also need to consider the toxicity of ammonia.

## **Knutson group**

Synnøve Seglem, deputy managing director of Knutson Group, said that the company believes that the internal combustion engine, together with zero carbon fuels, still offers the "most promising path towards complete decarbonisation", rather than fuel cells or nuclear power.

"Combustion engines offer enormous potential for rapid emission reduction,"



Mikael Wideskog, Director, Sustainable Fuels & decarbonisation, Wärtsilä Marine Power

she said. "Fuel flexible engine technology gives an upgrade path for existing and new vessels."

Knutson Group has a fleet of 15 LNG carriers, 29 shuttle tankers, 2 FSOs, and 3 chemical tankers.

The key factors for Knutson are availability of the fuel, and the capex and opex costs of using it.

"Carbon neutral fuels typically require existing equipment to be modified at least for some of the fuels. Those fuels are likely to be more expensive than fossil fuels, at least initially," she said.

Also, most carbon neutral fuels have a lower energy density compared to fuel oil, so need bigger storage tanks for the same vessel range. So the vessel structure needs to be considered.

Other factors are the need to store hydrogen at cryogenic temperatures, the toxicity of ammonia, and the capacity of shipyards to make modifications.

Ms Seglem does not expect green synthetic fuels (gas or liquid hydrocarbon fuels made using hydrogen from renewables and recycled CO2) to be available to the shipping industry until "close to 2040".

We are likely to see "multi fuel technology" – engines which can use different fuels, she said.

Knutson sees methanol as "the next fuel in the road map," after LNG, since it has already been introduced to the market, with previous generation engines being retrofitted to run on it.

The third fuel Knutson is planning to test is ammonia, which is carbon free.

"The combustion concepts to maximise engine performance and related safety technologies [with ammonia] are being investigated as we speak," she said.

A further possiblity is using a natural gas and hydrogen blend, up to 20 per cent hydrogen by volume. "We are further studying concepts to bring the share of the hydrogen higher up to full use," she said.

Knutson is looking at stainless steel vacuum insulated LNG tanks, which could also be used for storing methanol, ammonia and synthetic methane.



# LNG fuelled vessels – engines and tanks

When considering LNG fuelled vessels, you need to consider which engine to use, and how the LNG will be stored onboard. DNV shared some advice

here are two main options for engines for LNG fuel, low pressure Otto engines and high pressure diesel engines, said Christos Chryssakis, business development manager with DNV.

A lower pressure engine can comply with NOx tier 3 regulations without additional equipment, and is a "bit lower priced", but there is higher fuel consumption and "some methane slip".

A higher pressure engine is "a bit more complex", needing some additional equipment to reach NOx tier 3 regulations. "They have much lower fuel consumption and virtually no

methane slip."

He was

speaking at

organised by

DNV on May

11, "LNG as

ship fuel - where

a webinar



are we and what comes next?" "Both WinGD and MAN have

christos Chryssakis, business development manager, DNV introduced new generation

of low pressure engines, with very low fuel consumption and reduced methane slip."

There has been "very significant improvement" in reducing methane slip on both 2 stroke and 4 stroke engines over the last 10-15 years, through optimising the combustion chamber design, so there are no cold areas, where the fuel is not burned.

There are also technologies being developed to remove methane from the exhaust, including a methane oxidation catalyst. "These devices typically have to run at high temperatures and need expensive materials, they are not commercially available yet. But they can reduce methane by up to 70 per cent in a 4-stroke engine."

# Tanks

The important safety principles with LNG tanks are to protect the gas from external events such as collisions, to have two barriers to prevent fuel leakage, to have leakage detection systems with alarms and automated safety actions, and a means to automatically isolate any gas which leaks, said Henning Pewe, senior principal specialist with DNV.

Most LNG fuel tank designs have a primary barrier, insulation, and a secondary barrier. The secondary barrier also stops water and humidity getting into the insulation, he said.

There are three fuel tank designs, called Type A, B and C.

Type A and B tanks fit within the hull of the ship and can be spherical or sort of rectangular (described as "prismatic"). These be used both for LNG as cargo, and LNG as fuel. Tanks built into the structure of ships, "have a good safety record, a long history with LNG vessels," Mr Pewe said.

The Type C tank is a cylindrical pressure vessel. It can be built away from the vessel, and put inside the vessel when fully built. Here, you have to consider to what pressure you will allow the tank to be filled, and put a safety valve at that pressure, so if the pressure goes above, it will automatically be released through the safety valve.

You have to consider that the tank itself may expand or contract in different external temperatures. Some tanks are designed with a corrugated internal surface, which enables some thermal expansion if the tank ever warms from its normal temperature of -165 degrees C.

When planning how much storage you need, you need to consider trading and bunkering patterns. For example, a large container ship could have a very large tank which could last an entire round trip from Rotterdam to Asia. It comes to a balance between how much of the vessel's cargo space you want to use for fuel, and how often you want to bunker.

## **Pressure management**

Some gas will slowly boil off (turn from liquid to gas), due to the insulation not being perfect. It cannot be released to the atmosphere for environmental reasons. But it cannot be kept in the tank, because it will cause the pressure to rise.

The best option is to consume it in the engine, another option is to reliquefy it. A third



option is just to burn the gas, but this is "just a waste of fuel," Mr Pewe said.

The tank is fitted with a pressure relief valve, to release gas in case of emergency pressure build up. But regulations

Henning Pewe, senior principal specialist with DNV

require that the tank must be able to operate for at least 15 days without pressure building up to the point where it pushes the valve open.

# **Container ship case study**

Mr Pewe presented a case study of a Hapag Lloyd 15,000 TEU container ship which converted to LNG as fuel, using a membrane Type B containment system from GTT for the tank, with a capacity of 6700 m3. The tank width is over 45m.

The tank needed to be designed to avoid the problem of fuel 'sloshing' around inside, which could de-stabilise the ship.

The construction method was to build an exoskeleton (external skeleton) structure for the tank in a shipyard, then build the tank inside the exoskeleton, then lower the whole thing into the vessel, so the amount of yard time taken up with installing the tank was reduced.

It was important to have a good project management team, co-ordinating the multiple suppliers and the yard, taking responsibility for delivery, he said.

There were strict limits on how much the structure could be bended, which made it "a very difficult procedure" to find a way to lift the tank into the vessel by crane without going above the limits. The vessel took 3 months in the yard altogether for the tank to be fitted.

# You can view the webinar online here

https://www.dnv.com/maritime/webinarsand-videos/on-demand-webinars/LNG-asship-fuel-status-and-outlook.html

# DNV – why LNG fuel makes sense

LNG fuel makes sense when you consider that it would enable a vessel built today to operate until 2040 under current and anticipated regulations, explained DNV

any people question how worthwhile it is running ships on LNG fuel, if it only gives a 6-20 percent improvement on greenhouse gas emissions once methane slip is taken into account, and a zero carbon fuel may be available within a decade.

The answer looks clearer when you look at how IMO's decarbonisation trajectory works, explained Christos Chryssakis, business development manager with DNV.

He was speaking at a webinar organised by DNV on May 11, "LNG as ship fuel – where are we and what comes next?"

Under IMO's Carbon Intensity Indicator

(CII), all ships, existing and new, will be graded according to their emissions per ton mile, and a grading model for that specific ship type. A score of A, B or C counts as a pass, and a score of D or E counts as a failure.

Failing ships will be required to make improvement plans. The grading model will be tightened every few years, so a ship which passes today may fail in the next tightening. The whole system is designed to ensure the maritime industry decarbonises at a rate to reach IMO's target.

To maintain its A, B or C status, a ship can reduce speed, or make some other energy improving adjustment to its equipment, such as switching to a lower carbon fuel. DNV assesses that half of VLCCs built before 2015 will be already on the failure line in 2023, if they operate at normal speeds. A VLCC built today running on conventional fuel will be sailable at normal speeds up to 2030. But a new-build VLCC with LNG as fuel will be sailable until 2040.

So despite LNG fuel only achieving a 14-23 per cent improvement in carbon emissions, it also means another 10 years of viable life.

Similar factors apply to bulk carriers, DNV calculates. As an example, for a conventional design of vessel that might fail by 2022, or pass up to 2026 with some optimising. But by using LNG fuel, it could be operated up to 2033.



# DECARBONISATION

The targets from 2030 to 2040 are not yet precisely set, DNV is using its estimate for this calculation.

DNV envisages low CO2 fuels coming onto the market in small volumes starting in 2025 or a few years after, and after that point LNG fuelled tankers could use something else such as bio-LNG to replace part of their fossil fuel.

But shipowners don't have much choice today – they either order conventional vessels which they can only sail for a limited period, use LNG vessels, which can ensure compliance for another decade without needing special zero carbon fuels, or don't order at all.

There are other commercial factors which may make LNG more viable. Consider that a vessel using LNG fuel will be able to go at a faster speed than a vessel with conventional fuel, but make the same emissions. A charterer needing cargo delivered more urgently may preferentially charter the LNG fuelled vessel. (This would of course negate the carbon benefit of using LNG.

There may be a need to pay carbon taxes in future for CO2 emitted. This would give an LNG fuelled vessel a small financial advantage.

In terms of overall economy, DNV calculates that the price of buying and running LNG fuelled vessels today is competitive with running high sulphur fuel vessels, based on both the capex and the fuel cost over 5-7 years.

Other environmental benefits are that LNG has a NOx reduction of 20-80 per cent, and no sulphur. The particulate matter is "significantly reduced".

### **Methane slip**

The CII calculations are based only on CO2 emissions. They do not consider methane slip (methane which passes through the engine un-combusted). This adds to the greenhouse gas emissions (GHG), because methane is a more potent greenhouse gas than CO2.

But DNV's calculations show that LNG is still better than conventional fuel on a greenhouse gas emissions basis, taking methane slip into account.

A low pressure, 2-stroke engine can achieve a 14 per cent reduction in GHG by using LNG compared to conventional low sulphur fuels, over the full lifecycle, DNV calculates. A high pressure, 2-stroke engine can achieve at least a 20 per cent reduction, compared to conventional low sulphur fuels. A 4-stroke engine running on LNG will see a 6-14 per cent reduction.

#### How many LNG fuelled vessels?

As of May 2021 less than 1 per cent of the existing shipping fleet were using any kind of alternative fuels, and about 0.16 per cent using LNG, according to DNV's analysis.

But already by mid-2020, 9.52 per cent of the vessel order book (new builds at yards) were for LNG fuelled vessels. Over the whole of 2020, 16 per cent of the vessel order book had LNG as fuel. Over Jan- April 2021, 18.5 per cent of new build orders had LNG as fuel. Extrapolating this trend indicates that the vessel order book for the whole of 2021 may be above 20 per cent LNG.

This is a much bigger proportion of the fleet than many people believe. To illustrate this, the webinar audience was asked to share their views about how many newbuildings to be contracted in 2021 would have LNG as fuel. 33% of the audience said less than 10%; 35% of the audience said 10-20%; 19% of the audience said 20 to 30%; and 10% said more than 30%.

The audience was asked what percentage of the shipping fleet would use LNG as a marine fuel by 2030.

2 per cent of the audience said under 10%, 20% of the audience said 10-20%, 40% of the audience said 20-30%, and 37% of the audience said more than 30%.

These percentages are on the basis of number of vessels. But if the analysis was in terms of dwt of vessel, the LNG percentage would be higher, because LNG is more likely to be used on bigger vessels, Mr Chryssakis said.

DNV forecasts that LNG consumption by vessels will grow from 1m tonnes a year in 2020 to 4m tonnes a year by 2025. It anticipates particularly big interest for container vessels, bulk carriers, and very large tankers.

## Geography

On a geographical basis, LNG fuelled vessels are now operating on most major shipping lines crossing the Atlantic and Pacific, Mr Chryssakis said. They are now being seen going around Africa.

The areas not yet covered well for supplies of LNG to ships are South America and South Africa. "For South Africa there are some projects in the next few years," he said.

"The availability of LNG is one big barrier that has to come down for LNG to be selected as a fuel."

There are LNG bunker vessels operating in Florida, Northwest Europe, Gibraltar, the Red Sea, Singapore, Korea and Japan.

The number of LNG bunker vessels and

their capacity has increased very quickly. Roughly half vessels are under 5000m3, and half are 5,000 to 10,000 m3.

The LNG bunkering domain is also showing a trend towards shorter term contracts, he said. "There's a lot changing."

The price of LNG fuels in ports is becoming more even. A few years ago, North America was cheapest, Asia most expensive, and Europe somewhere in between.

## **Replacing with biogas**

One option over the longer term is to start replacing LNG with liquefied biogas, for example from rotting organic matter (plants). In determining whether or not this is better, there is a complex lifecycle CO2 emission calculation to make.

The carbon which is emitted when combusting the methane would have originally come from the atmosphere when the plant was growing, so in this sense the cycle is carbon neutral. But there will have been emissions associated with growing the plants, such as for tractors and fertiliser manufacture, and in transporting them.

If the organic matter was not grown specially to make the biogas, there is an argument that using the biogas as fuel prevents methane entering the atmosphere, which would have happened as the organic matter rotted otherwise, such as in a landfill.

Depending on these factors, the biogas could be as bad as hydrocarbons, or close to carbon neutral, Mr Chryssakis said.

There is also a range of forecasts for how much biogas will be available for ships.

Despite this, DNV sees that biogas offers "real potential for vessels," Mr Chryssakis said. "This is one way to make LNG engines sustainable into the long-term future."

# **Replacing with zero carbon fuel**

2025 could be "a bit optimistic" as a date for seeing low carbon fuels available for shipping, such as hydrogen and ammonia. "It could be a few years later," he said.

Factors affecting availability include infrastructure and storage, the maturity of technology, energy density and the price.

"We're trying to guess what is going to be the best zero carbon fuel option. This is a very difficult question."

You can view the webinar online here

https://www.dnv.com/maritime/webinarsand-videos/on-demand-webinars/LNG-asship-fuel-status-and-outlook.html

# How ship recycling is evolving

The ship recycling sector has seen big improvements in safety, much of it driven by the Hong Kong Convention. But conflicting EU requirements can cause more harm than good, and COVID is causing difficulties, we learned at an ICS webinar

here has been a big increase in the number of ship recycling yards which are compliant with IMO's Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, we learned at an International Chamber of Shipping webinar on ship recycling held on May 12.

92 recycling yards were compliant by May 2021, with all yards in India expected to be compliant by 2022.

"The Hong Kong Convention and certification of the 92 yards by major class societies is a very good and positive thing," said Espen Poulssen, chair of the International Chamber of Shipping and moderator of the webinar.

"I suspect that due acknowledgement has not been given of these improvements. You have to read statistics, which nobody bothers to do."

# **Global Marketing Systems**

Anil Sharma, CEO of ship recycling intermediary Global Marketing Systems, noted that there had been big swings in the prices of scrap metal in India for ships over the Covid period.

At one point the price commanded by ships being sold for recycling collapsed by 25 per cent, but then rebounded after 30 days, going from \$300 a tonne to \$550 a tonne.

These high prices are expected to last through 2021, he said. One driver for the rising price of scrap metal in India was a drop in steel production in China, which led to reduced exports of steel from China to India.

The recycling work during 2020 was 50 per cent bulk carriers, with the biggest sector within that VLOCs (very large ore carriers) with almost 30 vessels delivered for scrap, "a record year". The next biggest segment was tankers, followed by container vessels.

So far in 2021, high freight markets have meant that there haven't been so many dry bulk and container ships being scrapped, but more offshore vessels and cruise ships, he said.

Shipowners typically recycle vessels when they can get a higher price for recycling than for selling. The VLCC recycling price at the time of the webinar is "in excess of \$20m," he said. "A couple of months ago, this was the second hand price of a VLCC."



# SHIP MANAGEMENT

## **Kalthia Ship Breaking**

Chintan Kalthia, CEO, Kalthia Ship Breaking, described as one of the leading ship recycling companies in Alang, said that one problem during the COVID period was that all oxygen gas was required for hospitals, and so was not available for metal cutting.

This prevented Alang from continuing in operation. Oxygen is also needed in the re-rolling mills, which process the scrap steel, he said.

"A lot of yards stopped their work, without oxygen they don't have anything to do. A lot of workers are leaving Alang, they cannot sit in the pandemic without work."

The crew change regulations under COVID also cause complexity, with difficulties with the vessel's final crew coming ashore in India.

"The whole shipping world needs to recognise the improvement and development which [yards], especially Alang, has made in the last 5 years," he said. "I'm not saying that we are done with the improvements, but the change in the last 5 years is remarkable."

# **Unhelpful EU rules?**

The EU's Ship Recycling Regulations, in force from December 2018, can add cost and complexity to recycling, without necessarily providing any benefit, it was explained in the webinar.

Mr Sharma told a story of a car carrier which his company, GMS, acquired from a Japanese owner in June 2020 for scrap. It offloaded cars in Belgium, then Spain, then Turkey, and then was sold for recycling.

While the ship was discharging cars in Turkey, the Japanese owners received a message from Belgian authorities saying that they were violating waste shipment regulations, because the proposed recycling yard did not meet EU standards.

The owner's lawyers were discussing with Belgian authorities for six months. Then they decided to take the ship back to Spain and start the paperwork again for a waste shipment.

Today is one year after the ship was due to be recycled. The asset is now valued at minus \$1.5m, due to the costs incurred over the past year. And none of this expenditure has achieved anything in terms of driving better standards in ship recycling, he said.

The problem is that while the Hong Kong Convention sets high standards, it has some small differences with European Union regulations.

For example the Hong Kong Convention specifies that the waste should be handled by the appropriate state operated waste organisation. The EU rules go further in their



Screenshot from the ICS webinar. Top row: Anil Sharma, CEO, Global Marketing Systems; Andrew Stephens, executive director, Sustainable Shipping Initiative. Bottom row: Espen Poulssen, chair, International Chamber of Shipping; Chintan Kalthia, CEO, Kalthia Ship Breaking

requirements, Mr Sharma said.

The EU rules also have specific requirements for medical facilities available at the yard.

"There are a lot of things not mentioned in the Hong Kong Convention which is there in EU's Ship Recycling Regulation. It is creating a mess," Mr Sharma said.

Mr Kalthia added that EU's Ship Recycling Regulations were originally created as a "stop gap measure" to be used until the Hong Kong Convention was ratified. "Now it has taken a life of its own."

"From a personal standpoint, EU Ship Recycling Regulation is doing more harm than good, if I have to be blunt about it. We need one level regulation, guideline, policy for ship recycling, give a proper standard so they can stick to the standard and do their job."

Andrew Stephens from Ship Recycling Transparency Initiative added that downstream waste management and the proximity of hospitals "is arguably outside the control of the shipyards and ship recycling facilities. That's government, national, regional, local responsibilities."

"Those facilities are also under the responsibility of national and local authorities in European countries."

"It is a good example of where wellmeaning and well thought out regulation, with perfectly good motives, imposed in different jurisdictions, can lead to the wrong result," said Espen Poulsson of ICS.

# SRTI

Andrew Stephens, executive director of the Sustainable Shipping Initiative, presented

one of his organisation's projects, the Ship Recycling Transparency Initiative (SRTI).

The aim is to improve transparency about how ships are recycled, and thereby help shipping companies choose better yards. It should help avoid a situation where all the benefits go to companies which recycle most cheaply.

There are 28 signatories, including 12 shipowners, 5 cargo owners, 7 financial stakeholders (investors / banks / insurers), and various other industry stakeholders. Tanker operator members include Teekay, Maersk, NORDEN, Stolt Tankers, and Altera (formerly Teekay Offshore).

Charterers can use SRTI's processes as a basis to set minimum requirements for the ships they charter, and financial institutions can use it as a basis for making loans.

"Something like this works much better, if all the parties buy into it,

rather than where bureaucracy interferes and causes unnecessary problems," said Espen Poulsson, chair of the International Chamber of Shipping, and moderator of the webinar.

"Most shipowners are very responsible and want to do this the right way, but prefer to do this in a way which is sensible and logical.

"It is interesting to know that financial institutions and cargo interests are buying into this."

A video download of the meeting is available at:

https://attendee.gotowebinar.com/ recording/5266369741393041164

# MarineShaft

# IF YOU THINK IT CANNOT BE REPAIRED -THINK AGAIN

MarineShaft specialize in class-approved cold straightening of bent propeller shafts and rudder stocks. We have the machine capacity and knowhow to find the best and fastest repair solution for your propeller and rudder equipment including on-site assistance.



# Remote monitoring of ballast systems

Ballast water system manufacturer Optimarin has developed a remote monitoring system, which can be used to check its system is being used properly and check for faults

ptimarin, a ballast water system manufacturer based in Sandnes, Norway, has developed a remote monitoring system, so shipowners can check that the system is operating properly from their offices.

They can check that the rate of flow of ballast water through the system is not too high for the organisms to be killed to the required level, taking into account the level of dirt and sediment in the water, which can inhibit the ultraviolet rays in Optimarin's ballast water system.

Shipowners can also use it to track levels of sediment and dirt in port waters around the world. This can be useful for planning ballasting in future.

The system has been used for a year in a pilot trial, on 15,990 DWT chemical tanker Latana, operated by Utkilen.

Optimarin has around 1200 ballast water systems installed on vessels, of which 350 are newbuilds, the rest retrofit.

# The digital system

The remote communications is handled with a device the company calls OptiLink. The necessary sensors are fitted on the ballast water system as standard, but shipping companies can choose OptiLink as an add-on.

OptLink costs Eur 2,000 to 3,000, on top of the cost of the ballast water system, which can be around Eur 200k.

OptiLink connects to the ballast water system via ethernet cable, and connects to the outside world via satellite or cellular connection.

The data is stored in the cloud, using the Siemens MindSphere software, designed for sensor data.

There is a possibility that the system could be connected to ballast water systems from other manufacturers, via open APIs (software to software connections).

Data from the system is normally one-way only (from ship to shore), so it is impossible to hack. It is possible to enable two-way communication, for example to update software, but this can only be done by someone pressing a physical switch on the shipboard system, and can only be enabled for a limited period of time.

If the shipowner agrees, Optimarin will also be able to use the data, so it can monitor how long different pieces of its equipment are able to operate, which types of operations cause more wear and tear, and how it can be improved.

# Compliance

The system is not able to directly detect whether the ballast water equipment is in compliance, because this would require analysing treated water for organisms, which needs a laboratory.

But instead, the compliance analysis is made using engineering models, taking into account the level of sediment or dirt in the water which obstructs the path of the UV light, and the flowrate of water.

In dirtier or more sediment rich water, the flowrate of the water needs to be reduced, to achieved the desired level of treatment of organisms, in a rate determined by the models.

# Using NanoVapor to suppress the evaporation of hydrocarbons

# The NanoVapor system suppresses hydrocarbon evaporation in tanks using a spray of droplets of a special fluid. This can eliminate explosion risk, and mean means there are no hazardous fumes to dispose of

he NanoVapor system uses a very fine spray of a special liquid, branded "BargeSafe", to create a molecular barrier on the surface of hydrocarbon liquids.

The concentration of evaporated hydrocarbons, for C5 and above, is typically brought to under 30 per cent percent of the lower explosive level, says Ecochlor, a ballast water management system manufacturer, which distributes the system through their global network of shipowners.

The actual amount of BargeSafe used is extremely small and does not negatively affect the properties of the tank content, Ecochlor says.

Evaporation of hydrocarbons can result in explosive gas mixtures, especially on small oil and chemical tankers below 8000 dwt, which

are not required by SOLAS to have an inert gas system.

A further benefit is that it avoids the need to vent hydrocarbon fumes to the atmosphere, which is illegal in some ports. Even if venting is not illegal, these fumes can be uncomfortable or toxic for crew and people living/working near terminals.

It can reduce or even completely eliminate the requirement and costs of such degassing services.

NanoVapor was first used in land-based applications. Shell recommended NanoVapor as "the best practice procedure standard" for securing underground storage tanks in their global petrol station network. The technology is also used for safe tank space entry in aviation.

It is supplied by Ecochlor through its

distribution network for ballast water management systems.

The NanoVapor evaporation barrier can last several days.

BargeSafe, the liquid used, is a non-reactive, non-toxic and biodegradable liquid which does not result in any extra sludge or waste.

The equipment is intrinsically safe, and powered by compressed air. It is type approved by Lloyd's Register.

Tanker operators have a choice of mobile / portable equipment, or a system permanently integrated into the tank's ventilation system. Installation should be a simple add-on to the existing tank venting process, which does not require major changes to cargo or safety procedures and protocol.



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# Seafarer competency management

There is a growing trend for tanker operators to implement seafarer competency management systems. Intertanko has provided guidance for its members on how to do it. A webinar organised by OTG on Apr 28 explored further

here is a growing trend for tanker operators to develop competency management systems for their seafarers, to track the competencies which seafarers have developed.

This is because companies no longer believe the formal certification-based competency management system is adequate for the growing range of skills which today's seafarers need. This includes technical skills, digital technology skills, and soft skills such as behavioural competencies.

The topic was explored in a webinar on April 28 organised by seafarer training company OTG (owner of the VideoTel and Seagull brands, among others), with participation from Intertanko, Wallem and IMEC.

# Wallem

Yvette de Klerk, head of training with shipmanagement company Wallem, said that the company has introduced a competency management system because it sees a gap between STCW and what ship managers actually need.

(STCW is IMO's International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, the regulatory system for managing competence).

The new need for these competences come from regulatory demands, oil company requirements, and also what Wallem determines is needed for vessels to be operated safely.

Wallem's competency management system supports seafarers' professional development, giving people a career pathway. It helps with succession planning, making sure there's someone able to fill a role if the person currently in it moves to the next step.

More technologically advanced vessels will need higher levels of skills, such as around dual fuel vessels, which STCW does not yet include, she said.

Ms de Klerk stressed the importance of making it clear to seafarers what the

company's objective is from a competency system, such as to improve compliance, improve commercial attractiveness, or improve safety. Companies should also be clear about how people are being assessed.

It is important to show seafarers how they benefit themselves, such as from being able to progress in their career as they demonstrate competence. It can help seafarers see how to progress to shore jobs.

When implementing a competency management system, it can be easier if you start small and then grow. For example, start from with office superintendents evaluating the top 2 or 4 seafarers on a vessel. If they do not have the evaluation skills to do this, "you are sort of dead in the water when you start off."

You could start with a generic system for the whole company and then gradually add more customisation, or start with one type of vessel in your fleet, such as tankers, then broaden it to all the vessels.

"It will depend on your internal resources, expertise, the manpower you've got."

# Intertanko

Intertanko has produced guidance on how to put together a competency management system (available only to Intertanko members), called Intertanko Competence Management Guidance (ICMG).

ICMG describes 72 different competencies, although ships do not necessarily need them all, said Phil Belcher, Marine Director, Intertanko, speaking at the webinar.

It shows how shipping companies can monitor and manage skill sets, and meet specific training needs, when they arise.

"We need to continue to support seafarers to build on their competence, so seafarers have the right tools to succeed in their job and their ongoing career," he said.

Intertanko considered carefully how to make seafarers feel that the system was working in their interests, rather than against them. "Nothing works without the seafarers needing or wanting to be part of it," he said. The system could help improve seafarers' employability, if they can show that their competence is above the STCW certificate level.

It is important that the system feels like part of people's working life rather than an additional burden. They should be developing these skills and competence anyway, not just because they are required to by a competency management system, and they should probably be getting assessed anyway, Mr Belcher said.

### IMEC

Adam Lewis, head of training at the International Maritime Employers Council (IMEC), said that IMEC also supports competency management systems because, like Wallem, it sees that competency requirements "are moving much quicker than STCW allows."

IMEC members together employ around 150,000 ratings.

In the traditional model, good quality ratings are seen as being on a pathway to getting certifications to become officers. But now companies are talking about an intermediate stage, which could be known as "senior rating". These jobs also need high skills, he said.

"We're seeing how much ratings are having to adopt the technology and computer age," he said. "10-15 years ago a rating would never be touching any computer system. That's certainly not true now."

For example, a pumpman on a tanker is a highly specialised job today, which is described in STCW with one paragraph, he said. "We've had to go far beyond the main competencies to really cover that."

"On new tankers, there's so much complexity. We're having to bring ratings up to speed."

A competency management system can also help seafarers have confidence in the ability of their fellow crew members, for example if they are working in an enclosed space, and one person needs to feel able to rely on another to

# SHIP MANAGEMENT



Screenshot from the OTG webinar on seafarer competency management. Top row: Sanjeev Soni, OTG; Raal Harris, OTG. Middle row: Philip Belcher, Intertanko; Yvette De Klerk, Wallem. Bottom row: Adam Lewis, IMEC; John Lloyd, Nautical Institute.

help them if they have a problem.

There will be work involved from shipping companies in implementing such a system, just like with any new competency management system.

"Hopefully over a short amount of time, it will become part and parcel of what you do onboard, rather than an extra burden," he said.

Plans are currently underway into revising STCW. With revisions every 20 years, it can mean that this revision will need to work until 2050, he said. "We've got to think about how things are going to change in the next couple of decades."

There can be a negative association to the word competency, for example if people understand it to mean that someone is only just good enough. In the airline industry, pilots are usually described as "highly trained," rather than competent, he said.

However Intertanko' s Mr Belcher noted in response that seafarers have to do a much broader range of tasks, rather than do one task extremely well, as a pilot does. For example, we don't ask pilots to ensure that an aircraft is loaded properly or tethered / moored properly, but ship captains have these responsibilities, he said.

# **Nautical Institute**

Captain John Lloyd, CEO of the Nautical Institute and formerly professor of maritime training at the Australian Maritime College in Tasmania, said he saw the purpose of competency management as "making sure seafarers are capable now and capable for the future."

Competency management programs can cover personal skills, such as empathy and critical thinking; life skills, such as communication and collaboration, working with digital information, and working with customers; and technical and professional skills.

"Companies of good standing are not accepting STCW as the panacea for all things that need to be done," he said.

A competency management system can help seafarers transfer what they learned in their core training to what is needed today. It can help the company to better support them as they develop, he said.

Individuals should see this as the "enabler for career growth", not a burden, Mr Lloyd said. It shows what they need to do "to open the next door for progression."

Any competency management system needs to include some kind of assessment. This should not be seen as a means to determine whether someone can do a job, but a means to determine what their development needs are, so they see it as something which supports them, he said.

It is important for seafarers to have confidence in the assessment process, if they are going to trust it, he said. It is very helpful if everything is transparent, seafarers can see how they are evaluated and see that it is fair.

If assessors are used, it is important they have the skills to do that – the professional competence, the personality, and whether they are able to make an assessment in an impartial and fair manner, he said.

### Technology

One of the first maritime competency projects was DNV SeaSkill, which DNV started building in 2005. Sanjeev Soni, now with Ocean Technologies Group's Singapore office, was formerly principal consultant for this project.

It may have been a bit ahead of its time, Mr Soni said on the webinar. In 2005, it was very hard to provide competency systems which seafarers could use onboard vessels, due to limited satellite communications bandwidth at the time, which meant that the systems were hard to get adopted.

Today, OTG is developing tools which can connect competency management systems to its digital courses. So once people have identified a gap in their knowledge, they can do a course on the same topic.

Seafarers are not accustomed to having assessment systems onboard, Mr Soni said. So it is important for companies to emphasise that it is not a pass-fail checklist, or a tool to help pick people to sack for incompetence or put people into a grade band.

"This is something essentially for personal performance and personal development of crew members."

"It helps if it is a completely transparent system," he said. "If you're going to hide the criteria of what you are assessed on, do it in a kind of stealth mode, it loses its purpose."

Another benefit to crew is that once someone can demonstrate to whoever does the assessment that they can do a task, it can be assumed they can do it again without supervision, he said.

# The hidden CO2 emissions from tank cleaning

Fuel consumption, and CO2 emissions, from tank cleaning can amount to as much as 12 per cent of the total emissions for a vessel, according to figures provided by Tanker Operator by Guy Johnson of consultancy L&I Maritime

uel consumption, and emissions, from tank cleaning, can be as much as 12 per cent of all emissions by a chemical tanker, according to figures provided to Tanker Operator magazine by Guy Johnson of consultancy L&I Maritime.

Typically during tank cleaning, the boiler and auxiliary engines consume 0.5-0.6 metric tonnes of fuel per hour, in order to produce hot water and steam, Mr Johnson says.

Ships don't clean every day, but as a minimum there will be one cleaning operation per month.

One cleaning operation can take as much as 236 hours (see below) so at 0.6 tonnes of fuel per hour, one clean per month, this means 141 tonnes of fuel used per month for tank cleaning.

Daily fuel consumption of a chemical tanker is around 35-40 metric tonnes of fuel per day. At 40 tonnes a day, with 25 days operation a month, that's 1000 tonnes per month. This is based on personal experience, and depends on size, loaded capacity and of course speed.



On this basis, the percentage of all fuel used on tank cleaning is 141 / (1000 + 141) = 12.3 per cent.

Hot water washing is an integral part of all tank cleaning operations, but it needs to be effectively and

Guy Johnson of<br/>consultancy L&I Maritime.effectively and<br/>safely controlled.

# **Over cleaning**

Mr Johnson believes that charterers are pushing vessels to overclean to standards that are, in the vast majority of cases, just not necessary to ensure the quality of the next cargo.

"This has to be regulated. Otherwise fuel consumption during tank cleaning is likely to

increase, rather than the opposite," he says.

"Many cargo interests, by their own admission, do not understand tank cleaning. As a result, pre-loading inspection specifications tend to be over cautious, which all but forces the vessels to over-clean."

"But how can not understanding ever be a defence for enforcing unsafe and environmentally polluting practices?"

# Let shipowners decide

At the end of the day, the owners/operators of tankers are always responsible for the quality of the cargo loaded on board their vessels, regardless of how many hoops they have had to jump through to get the cargo on board, Mr Johnson says.

"If the owners/operators are ultimately culpable, let them take responsibility, by monitoring their own tank cleaning, using tried and tested methods and procedures."

"Cargo interests only need declare any specific quality concerns so owners/operators can deal with these correctly and precisely. This is necessary because many times a cargo has become "contaminated" because cargo interests did not state that their cargo was sensitive to a specific contamination. Instead, they relied on a wall wash inspection to ensure that the cargo tanks were sufficiently clean enough to load."

"If the next cargo is sensitive to aromatics, or oxygenates, or organic chlorides or whatever, let this be known to the owners/operators and don't pretend a wall wash inspection will lessen or even remove the impact of this contamination potential."

# **Environmental footprint calculation**

The following environmental footprint calculation for tank cleaning is based on real information supplied by L&I Mariitme.

It is based on the same vessel cleaning from the same previous cargo to load the same next cargo, but in two different occasions, and the charterer and the respective pre-loading inspection requirements were different for the two cases.

The vessel is 45k DWT tanker with 16 cargo tanks coated with zinc silicate.

The previous cargo was ultra-low sulphur diesel. The next cargo is methanol to IMPCA (International. Methanol Producers and Consumers Association) quality and purity standard.

The Basic Tank Cleaning Procedure uses two fixed and two portable machines per tank. Two cargo tanks can be washed simultaneously.

## The procedure was:

- Annex I wash to slop; 3 hours (70-80<sup>o</sup>C) hot seawater open washing;
- 4 hours hot (70-80°C) seawater open washing;
  4 hours hot (70-80°C) chemical recirculation (Recirculation in 10M3 of FW. First round of recirculation with 0.5% detergent and 2% sodium hypochlorite. Subsequent rounds of recirculation with 0.5% detergent only).
- 4 hours hot (70-80°C) seawater open washing; gas free and wall wash inspection for compliance with pre-loading inspection specifications. Repeat the 4 hours hot seawater open washing / chemical recirculation steps above until pre-loading inspection specifications are met.
- 30 minutes hot (70-80°C) freshwater open washing; de-ionised water rinsing; ventilation / mopping to dryness

The pre-loading inspection specifications in the first loading port were 1ppm max inorganic chloride, 50 minutes minimum permanganate time, a pass for hydrocarbons water miscibility, and 5 APHA max colour. The second loading port did not set any such specifications.

This meant that in the first loading port, the total cleaning time required to meet the inspection specifications was 236 hours (8 tanks, and 27 - 35 hours per tank, 3 or 4 rounds recirculation). In the second loading port, the total cleaning time was 92 hours, or 11.5 hours per tank (1 round recirculation).

# SHIP MANAGEMENT

The methanol cargo loaded at both load-ports met the same internationally accepted quality standards, and both cargoes were discharged successfully.

"This can only say one thing, that the additional tank cleaning carried out prior to loading at loading port 1, was completely unnecessary," Mr Johnson says.

The 144 hours of hot water washing liberates 273.6 metric tonnes of CO2 into the atmosphere.

# Charterers

Does the role of the charterer directly contribute to the environmental footprint of tankers?

"Absolutely yes, to the tune of 144 hours (236 - 92) of hot water washing in this example, which is equivalent to 61 per cent

more GHG emissions at loading port 1," Mr Johnson says.

"Furthermore, because tank cleaning prior to loading at loading port 1 required multiple rounds of cleaning chemical recirculation to achieve the pre-loading inspection specifications, an additional 1.8 cubic metres of detergent was unnecessarily pumped into the sea."

"If tankers are going to have any chance of achieving the far-reaching demands of MEPC 75 and beyond, charterers have to be stopped from forcing vessels to over-clean, simply because they can."

"This is not just about the ethical question of whether the cargo has a higher value than the environment (or crew safety), this is now about global sustainability." "How can any charterer justify that their cargo is worth 61 per cent more GHG emissions and 1.8 tonnes of excess detergent dumped into the sea, for the sake of a wall wash inspection, that actually provides no reassurance, guarantees nothing and ultimately has no impact on the ability of the vessel to load and discharge the cargo successfully?"

"This is even more astonishing when it is recognised that tank cleaning is based on what charterers perceive as being "clean", in other words, commercial preference."

"Just because one charterer demands APHA colour 10 in a wall wash inspection, but another demands APHA colour 5, does not mean that one vessel is "dirty" and the other is "clean". But cleaning "from colour 10 to colour 5" will very often require chemical and / or hot water washing."

# ICS guide to helicopter landings on ships

# ICS has published a new edition of its Helicopter Guide, for the rare occasions when helicopters need to land on vessels to take a seafarer to hospital. It includes a section on tankers

he International Chamber of Shipping (ICS) has published a new edition of its Helicopter Guide, advising seafarers how to manage the rare helicopter visits, for example following an injury.

Helicopters may visit ships although they do not have a dedicated helicopter landing platform or staff fully trained in helicopter operations. The helicopter will either land on the deck, or somebody will be winched up.

In many cases, seafarers follow the guide's step by step instructions to prepare for a helicopter call, because it is not something they have experienced before, ICS says.



just for rescue. Helicopters are increasingly used for crew changes, to transport pilots, and for some stores deliveries, ICS says.

To update the Guide, ICS has put together an expert group, including representatives from the UK's Marine Accident Investigation Board (MAIB) the US Civil Aviation Authority (CAA), and the Maritime Pilots Association. Shell has provided input particularly on LNG operations.

The section of the Guide dedicated to tankers notes that oil tankers are normally suitable for helicopter operations because they have a large area of deck space fairly free of obstructions, which is not common on a container ship or LNG carrier.

Chemical tankers often have more cargo lines, air pipes, external deck stiffeners, so less suitable for helicopters. Another option is landing people by winch on a bridge wing.

But landing the helicopter on deck is a quicker and less hazardous operation than winching.

There are concerns about oil vapours on tanker decks, but investigations show that a hovering helicopter produces a strong downdraught which will rapidly disperse any vapour. Also, a rotor rotating when a helicopter is on deck will disperse any vapour, the Guide says.

If is necessary to stop the rotor during

landing, then the rotor should not be restarted until the atmosphere around the helicopter has been tested for gas.



A 2 minute video has been made to promote the Guide, including footage of helicopters attending merchant vessels demonstrating the challenges. See https://www.youtube. com/watch?v=SD8gmSSDv-Q

# ERMA FIRST – EC vs UV for ballast

ERMA FIRST, the manufacturer of electrochlorination (EC) ballast water treatment systems based in Greece, shared some interesting perspectives on how EC systems compare with UV

r Stelios Kyriacou, chief technology officer with Greek ballast water treatment systems manufacturer ERMA FIRST makes some interesting arguments as to why he thinks electrochlorination (EC) technology is better than ultraviolet lamps (UV) for ballast water treatment systems on tankers.

Although he works with EC systems now, Mr Kyriacou has led the development of EC and UV ballast water treatment systems as part of former employment with Hamworthy and Wärtsilä, and so has a deep knowledge of both technologies.

He does not believe it is true, as some say, that UV is a simpler technology. "I would argue that it is just as complex as everybody else's [technology]."

When water has high levels of opaque solute (something dissolved in it which light cannot easily penetrate, such as sediments and other chemical compounds) also known as low transmittance (UVT) or high turbidity, UV systems need much more power for the same level of capacity to kill organisms. And since these materials are actually dissolved, like salt in water, they cannot be removed using a filter, he says.

"The penalty is they have to use high power on their lamp systems. That penalises the customer in terms of OPEX," he says.

Alternatively, "they would have to throttle the flow. A system specified, let's say, for a tanker at 1500 or 3000 m3 / hour, at the point of encountering these dirty waters, may have to sacrifice 45 per cent of its flow capacity."

If water flows more slowly through the ballast water system, there is higher exposure time for the UV radiation to kill organisms, compensating for the slow penetration of the light through the dirty water.

EC systems do not have this problem, because they are not reliant on light being able to penetrate the water, he says.

Another downside of UV systems relative to EC is that the lamps take a certain time to reach their full power, which can be 6-10 mins if the water is cold.

With an EC system, the reactions start as soon as power is delivered to the cells. The power activates the electrochemical reactions that generate sodium hypochlorite (NaOCl) the chemical which kills the organisms.

A further downside of UV systems is that the lamps can be expensive to replace and also costly to dispose of, since they contain mercury amalgam, which needs special services for recovery and recycling. This service is also not available everywhere in the world, he says.

# **Filters and sediment**

Mr Kyriacou says he finds himself increasingly thinking about filters. They are used to pretreat the water before it goes into the ballast water tank, separating the particulates out mechanically.

Typically, UV systems will use filters with 20 microns mesh size, and EC systems will require a less demanding filter, with 40 microns mesh, he says. This is because UV rays are blocked by particulates in the water.

This is another indication of where EC systems may be more robust – the higher the required filtration level, the harder it is to achieve that reliably and maintain the design flow rate, he says.

If a filtration system is not used, the sediment will enter the ballast water tank, where it will settle to the bottom and need to be disposed of later.

Mr Kyriacou said has participated, along with representatives of other ballast water system suppliers, to give his views on the new proposed ballast water rules in the UK.

The UK is proposing regulations for sediment treatment, stating that it may not be discharged uncontrolled into the sea, he says. Instead, dry dock yards should treat the sediment as industrial waste, and it should be controlled and handled like any other industrial waste.

## **Remote monitoring**

In October 2019, ERMA FIRST acquired a controlling stake in METIS Cyberspace Technology, which makes systems for data acquisition from ships, and monitoring vessel performance. Now, ERMA FIRST is applying METIS' technology to do remote monitoring of ballast water systems.

ERMA FIRST and METIS are developing models which ingest data from sensors on the systems, to get insights into how the machinery

is operating, and identify emerging problems.

Some shipowners do not want any real time data connectivity with shipboard equipment due to cybersecurity concerns. In this case, another option is that the data can be stored onboard and sent periodically as an e-mail attachment.

"We are slowly developing a knowledge base around common conditions with common faults," he says. "That should enable us to be extremely responsive."

## **About ERMA FIRST**

The company's full name is ERMA FIRST ESK Engineering Solutions S.A.

As of May 10 2021, it has 1400 ships in operations using ERMA FIRST FIT ballast water systems, and 1650 ballast water systems in use (because some ships have two systems, the second system for the aft peak tank). It has further orders with 810 ships.

The company claims to be in the top 5 ballast water system suppliers in the world.

25 per cent of the vessels in its customer list are tankers, and 6 per cent gas carriers. The remainder are a mix, including some super yachts.

Manufacturing is in Greece. As a Greek company, it has a good knowledge of the pathways into Greek companies and decision making processes, Mr Kyriacou says. It also has customers in other parts of the world – some key customers are in Germany, Netherlands, Belgium and Canada.

ERMA conducts most manufacturing and assembly in Greece, but has capability to build large fabrications in Korea, for vessels being built there.

It has a team of 80 commissioning engineers in greater China (Chinese nationals).

ERMA FIRST operates two training centres, one in its headquarters in Perama, , Greece, and another in Manilla Philippines. It also provides computer based training, and has maintenance videos on its YouTube channel and website.

Another development from the past 10 months is that ERMA FIRST received a ballast water code certificate from China Maritime Authority, along with approval from China Classification Society (CCS). "We are the only western supplier with full certification from China," he says.

# Fixing damaged propeller blades and shafts

Fixing damaged propeller blades and shafts can be more viable than many tanker people imagine, says MarineShaft

arineShaft, a company specialising in propeller shaft, propeller, and rudder repairs, based in Hirtshals, Denmark, was recently asked to repair a badly bent propeller shaft of the Corsica Lines ferry, Paglia Orba.

The shaft, which was nearly 19 metres long, had a deflection of 7.7 degrees and was around 250mm out of the centreline at the worst point.

The repair consisted of cold straightening and repair of an intermediate shaft 7.4m length, and cold straightening and repair of the main propeller shaft 18.9m length.

Cold straightening, as the name implies, means straightening metal without using heat.

Marine Shaft used a purpose built hydraulic press to do the cold straightening.

"The job done by the MarineShaft team is impressive. I was really impressed by [their] knowledge, technicity, and trust to restore the shaft," said Bruno Rogier, superintendent, Corsica Linea SAS.

"Most people would probably think that a damage of this size is unrepairable and surely never approved again by a classification society," says Hanne Magnussen, marketing manager with MarineShaft.

"However, the shaft has been cold straightened with full class approval, and Paglia Orba is back on duty."

The benefits of cold straightening, MarineShaft says, are that it is fully approved by class societies, it is considered a permanent repair, the result is considered equivalent to a new shaft, it is fast and cost effective, the metallurgy of the shaft material is not adversely affected.

MarineShaft can straighten shafts from 20mm to 1.5m in diameter, with no limitation to length. There are also carbon benefits, in that every kg of new steel avoided means 1kg less CO2 emitted to the atmosphere, MarineShaft savs.

# Tankers

The company has recently done two interesting repair jobs on tankers.

One suezmax tanker needed an onsite repair of its entire shaft line.

The vessel had experienced problems with the flange connections (which connect the shaft elements together). This was caused by fretting damage (corrosion damage causing unevenness at contact surfaces).

The vessel had to face an unplanned "lay of service", and went to quay in Asia.

No local shipyard could provide the necessary care. MarineShaft was contracted to provide a complete repair solution,

The company manufactured a new spacer ring, hydraulic bolts and nuts, which were sent



The 19m propeller shaft of ferry Paglia Orba, which was bent back into shape



Close up of damage to the propeller blade on chemical tanker Birgit Knutsen

to the vessel together with a team of service technicians.

MarineShaft made a special mobile machining device, to machine the flange surfaces actually in the vessel's engine room.

The onsite job included laser alignment of the shaft line; jack up test; machining of tail shaft flange, crankshaft flange, intermediate shaft flanges; and onsite boring of reamer holes in flanges to fit new hydraulic bolts and nuts.

Despite dealing with a covid pandemic that put some extra delay to this repair, everything came together and put the tanker successfully back in operation, MarineShaft says.

MarineShaft has a wide range of mobile machining tools for all types of onsite repairs, and are able to design and build custom-made equipment, as in this case.

Another recent tanker repair was four propeller blades on 16,500 dwt chemical tanker Birgit Knutsen. The damage was discovered during a planned dry-dock in a Danish shipyard.

Each blade had a net weight of 4600 kg and measured over 2 meters in height. In 6 days, MarineShaft was able to repair the bronze blade.

MarineShaft recently upgraded its capabilities for propeller shaft and rudder stock repairs, with the installation of a new Skoda lathe with CNC (computer numerical control) and capability for milling and turning.

The new lathe has a maximum capacity of 2.2m diameter, 27m length. It will enable MarineShaft to carry out emergency repairs of shafts and rudder stocks with even bigger dimensions in the future.



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