TANKEROperator

JUNE 2020

www.tankeroperator.com


THE MARSHALL ISLANDS REGISTRY
STEADFAST QUALITY
UNMATCHED SERVICE
The Marshall Islands Registry consistently performs making QUALSHIP 21 for the 16th consecutive year. The record speaks for itself.
Choose to fly the world's local flag.
www.register-iri.com | piraeus@register-iri.com
International Registries, Inc.
in affiliation with the Marshall Islands Maritime & Corporate Administrators

Contents

ABS advice on finding a low carbon strategy

There is much to read about different approaches to low carbon shipping, but very little of it actually guides you, as a tanker operator, as to what you should do. ABS is aiming to fill this gap

A starting point for each shipping company could be to follow IMO's targets of reducing carbon intensity by 40 per cent by 2030 and 70 per cent by 2050, says Sotirios Mamalis, manager sustainability, fuels and technology with ABS. Each company will have its own roadmap to do this, based on the composition of its fleet and operations.

For example, ABS designed a model for a shipping company operating 10 bulk carriers today (2020). It could achieve the 2030 target first by reducing speed of all vessels by one knot. In 2023, it could replace three of the vessels with new LNG fuelled vessels (or retrofit 3 of the vessels to run on LNG). In 2025, it could introduce biofuel into 3 of the other vessels. This would add up to a 49 per cent reduction in CO2 emissions over 2020 to 2030.

We don't need to change everything. ABS predicts that by 2050, 40 per cent of maritime fuels will still be oil based, while 35 per cent will be zero carbon fuels, either hydrogen or ammonia. A smaller fraction will be others, such as biofuels, methanol, LNG and LPG.

Fuel

The most important method of reducing CO2 emissions is different fuel types, Mr Mamalis said. The company divides the fuel options into 3 pathways, light gas, heavy gas and bio-synthetic liquid.

The light gas pathway starts with LNG, then moves to LNG created from bio or renewable electricity methods, then hydrogen.

LNG technology is established, and has a lower CO2 compared to oil, Mr Mamalis says. It means getting to grips with fuels which are stored in a different state to the one in which they are used (liquefied to cryogenic temperature, in this case). The engine technology is established and being improved. Vessels equipped for using LNG can transition to using bio or renewable electricity methane, ultimately hydrogen.

A challenge with LNG fuels is the methane emissions, which can come from the LNG production process or from methane 'slip' out of the engine. Methane is a stronger greenhouse gas than CO2, so a small amount of methane emissions can counter larger cuts in CO2 emissions from using LNG rather than liquid fuels.

The heavy gas pathway starts with LPG, then moves to bio and renewable electricity created fuels, including methanol, and ammonia.

LPG is currently only used as a fuel in LPG carriers (which burn their cargo for propulsion). There can be similar challenges to LNG for fuel containment and gas supply systems. It is possible to produce LPG and methanol for renewable energy. Ammonia "seems to be promising," he says.

The bio-synthetic liquids family starts with biodiesel, and moves to gas-to-liquid fuels, and 2nd / 3rd generation biofuels. A benefit is that they can be used with existing diesel engines, with almost no modifications.

The CO2 from combustion is the same as with standard diesel, so it is very important to look closely at the lifecycle assessment – how much CO2 is taken from the atmosphere as the biofuels are grown (and what would be happening if they had not been planted), says Georgios Plevrakis, ABS director of global sustainability.

One fuel which may come into use is dimethyl ether, an isomer of ethanol, which is already used in heavy duty trucks. It can be used in diesel engines with very few modifications. It can be made from synthesis gas, using electricity from renewables as the energy input.

Mr Plevrakis sees that electrification could be a "common denominator" in future vessel designs – perhaps all vessels will convert their fuel to electrical energy and use that to power the vessel. This also enables the vessel to easily switch to external electrical energy when berthed.

The most mature of these three fuel pathways is the light gas since LNG vessels have already done millions of running hours. But there is plenty more to be solved achieving wider adoption of LNG, and further decarbonising of it, he said.

Operations

In terms of vessel operations, ABS sees that weather routing and "just in time arrival" are two useful technologies.

Weather routing means finding the best route for the vessel, in order to avoid bad weather, which means higher fuel consumption per mile. Just in time arrival means planning the vessel's arrival at a berth exactly as the berth becomes available. If you arrive early and have to wait, it means you went faster (and burned more fuel) than you needed to.

Just in time arrival is complicated because it requires input and co-ordination of multiple groups – shipping companies and port operators, but also freight handling companies, customs and other regulatory bodies have input into when a vessel is allowed to leave, thus freeing up the berth for the next one. But despite this complexity, "it is worth pursuing because of benefit," Mr Mamalis says.

What zero CO2 looks like

To explore what a true zero CO2 vessel might look like, ABS built two designs for a 6,600 dwt chemical carrier with a 3MW electric propeller motor.

The first design uses ammonia fuel. It has 510m3 of ammonia storage onboard, in two "Type C" cylindrical pressure vessels. This leaves space for the vessel to carry 7,700m3 of cargo, and a range of 4,200 nautical miles. The ammonia provides energy for a 3.5MW solid oxide fuel cell, which generates electricity to be stored in a 15 MWH battery back, to run the propeller.

The second design stores energy only in batteries. It has a 215 MWH lithium battery pack. This takes up much more space otherwise used for cargo, only leaving 4450m3 space for cargo. The range is also much reduced, to 720 nautical miles.

TO

TANKEROperator

Vol 18 No 13
Future Energy Publishing Ltd
39-41 North Road
London N7 9DP
www.tankeroperator.com

PUBLISHER / EDITOR / EVENTS
Karl Jeffery
Tel: +44 (0)20 8150 5292
jeffery@tankeroperator.com

ADVERTISING SALES
David Jeffries
Only Media Ltd
Tel: +44 (0)208 150 5293
djeffries@tankeroperator.com

PRODUCTION
Very Vermilion Ltd.
Tel: +44 (0)1253 812297
info@veryvermilion.co.uk

SUBSCRIPTION
1 year (7 issues) - £195
Subscription hotline:
Tel: +44 (0)20 8150 5292
sub@tankeroperator.com

Frontline, Prime Marine, SSY and OilX on tanker markets

An online panel discussion on Apr 30 explored where the tanker market may be headed, organised by Signal Group and with participants from Frontline, SSY, Prime Marine and OilX. Interesting issues are the storage market and the current high demand for product tankers

Semi Assimakopoulou, VP sales with Signal Group, introduced the discussion by noting than when there are changes in the market, it is often the VLCCs which are first to see price spikes in both directions – up and down. The market is currently "super volatile," she said.

We are taking crude storage capacity to its limits, said Claire Grierson, head of tanker research with shipbroker Simpson Spence and Young.

SSY monitors long term storage, which it defines as tankers stationary for more then 3 months.

With shorter term storage, it isn't always obvious if the vessel has been specifically booked for storage, or is just waiting for a berth, she said. In China's boom times of last decade, it could be common for ships to be waiting for over 7 days to discharge in Chinese ports.

Sometimes vessels are being booked on a voyage basis, with an option for storage at the end of the voyage, for up to one month. "So there's a lot to monitor," she said.

There was a rise in storage during 2019, some of the growth being Iranian vessels cut out of the market by sanctions used for storage, and also stores of very low sulphur fuel oil, in advance of the requirement for ships to use it in January 2020.

We are currently seeing the product tanker market hitting record highs, far surpassing any previous peaks, she said. Refineries have been "exporting because they needed to export."

"We've seen a counter seasonal rise in naphtha volumes moving from the Atlantic, because the demand hasn't been there for gasoline for naphtha blending. The product has been available and it is being shipped East."

Frontline

"What we've seen initially is a massive reaction on VLCCs [since they are] most suitable for crude storage," said Lars Barstad, commercial director, Front Line.

There is a delay between when ships are chartered for storage and when they are actually used for storage. "I don't think we've seen the real effect of ships sitting," he said.

"With regards to trading patterns we expect a lot of cuts coming from Middle East Gulf. The volumes which we could call short haul will be hurt - Mid East to Asia."

"On dirty Aframaxes, we're a bit challenged by Russian cuts, cargo programs in Baltic and North Sea being cut severely. US markets are still good."

"I'm extremely positive to the Afra [max] and LR2 space as it is right now. We will see really interesting things happening for the next quarter on the LR2 segment."

"We're just in the start of severe refinery run cuts, they've been over producing a lot of product – in particular jet. It will create arbitrages, which will make that market quite exciting for the longer term."

It is possible that the same oil molecules are going from East to West, and back to the East, he said.

Mr Barstad also noted that some companies appear to be paying for freight for cargoes which costs half of the value of the cargo itself, which is "not sustainable".

"If you see $200K / day return on an LR2 – you can't expect it to go much further. We have to be a bit more modest. The same for VLCCs. Whenever the value of freight reaches a certain percentage of cargo, things stop." But meanwhile, "shipowners are in a position to make an incredible amount of money."

For the tanker market overall, "we have an aging fleet in all sectors, we have literally no ordering of ships," he said. "I think the fundamental outlook looks much better now than in previous cycles due to the fact that the fleet is shrinking in most sectors for the next few years."

OilX

Florian Thaler, CEO of London oil analytics firm OilX, noted that the tanker industry has had a double shock, with first the excess oil supply from Saudi Arabia, then the Covid-19 virus killing demand.

The OPEC arrangement to cut supply is seen by many in the oil trading sector as too little, too late, he said. "But we think it is a strong attempt to help us to flatten the curve."

OilX calculates that there could be another 300m to 400m surplus barrels of oil production before tanks get full, which makes for a prediction of mid-June. But then during May and June tankers can provide floating storage as a buffer. But then the next question is how fast demand recovers. Jet fuel may have a slow recovery, or "L shape". But other markets may be more of a U.

Prime Marine

Joseph Tzardis, chief commercial officer of Prime Marine, said that the market is very strange, with bearish predictions on cargo rates but actually very high freight being paid for LR1s and LR2s.

"It is an interesting challenge to try to break this down."

When the demand for products dropped, refineries had no alternative but to ship or store them if they couldn't be sold. But it isn't obvious which vessels are chartering for storage or for transport.

"We are all drawing ourselves to the same conclusion, tanker availability is hugely uncertain in the months to come. I don't think anyone can predict the unwinding of storage," Mr Tzardis said.

But meanwhile, "the money made is such that owners dictate freight [rates]. This is not something we have encountered too many times."

Vortexa – Real-time waterborne oil analytics

Vortexa offers a live data set of liquid oil and tanker movements which a trader can query to understand real time changes in the global oil market

Vortexa, based in London, Houston and Singapore, provides real-time data analytics of liquid oil and tanker movements by subscription. The service is delivered through a web based interface that allows anyone to easily interrogate the data to ask various questions around waterborne oil.

In addition to this, they have created a software development kit (SDK) to make the data easily accessible for data scientists. To query the data, you will need to be able to construct a query using Python, which is a standard competency of data scientists. You can download sample Python queries free online at www.github.com/VorTECHsa/python-sdk

The service is designed for anyone who has an interest in global oil flows or tankers. The purpose of the data set is to enable clients to gain an understanding of the global supply and demand of oil.

Traders gain an 'edge' through access to insights that other traders don't have – and Vortexa is designed to provide this.

The company was founded by Fabio Kuhn, former Head of Trading Technology and Analytics at BP, who serves as CEO, and Etienne Amic, former Head of European Energy at JP Morgan and Mercuria, who serves as chairman.

The database covers everything from crude oil to LPG and allows users to isolate specific grades of crude oil or individual specifications of refined products.

Example use cases include seeing all the oil cargo movements that took place on any given date

This is not exactly the same as the vessel movements – because oil being carried from an origin to a destination may have been on multiple vessels, and a vessel can stop at multiple terminals on its voyage. Also some vessels are being used as storage rather than freight.

Similarly, you can interrogate the database to find out the volume of oil currently in storage (not being moved) in different parts of the world, although some of the oil may be in a freight agreement with the shipowner rather than a storage agreement.

"The more we share with people, the more we learn about other use cases for the data," says Syed Ahmad, market analyst with Vortexa. "Our clients will sometimes surprise us with a new use case we haven't thought of."

Data sources

To populate the database, the company "relies on hard data as much as possible," says Kit Burgess, data scientist.

If you know what cargo is booked on a vessel, or what the vessel is doing, you can get a lot of inference from that.

Data is brought in from a number of sources, including agents and brokers. "We try to harmonise all of that data to give you one clean consistent view of the global oil market," he says.

The company looks for stationary vessels using satellite data.

If data is not available, the company has models which are used to try to make a prediction.

The company also employs in-house analysts who are trying to spot new trends.

The company can have data on loadings going 1-2 months into the future – with knowledge about arrivals going further into the future (2-3 months).

Floating storage

Floating storage is a complex market to understand. At a basic level it is driven by the "calendar spread" – the difference between today's prices and the future prices (which can be bought today as a 'future') – whether it works out profitable to store oil, given the cost of the tanker storage per day.

Kit Burgess, data scientist

Syed Ahmad, market analyst with Vortexa

When future prices are higher than today's prices, "you can see people trying to slow vessels down, delay discharge, do anything they can to push pricing windows into the future," says Vortexa's Mr Ahmad.

But also, in a time of Covid-19, there is reduced oil demand, which means a reduced requirement from customers for tankers for freight. There is also high demand for tankers for freight in other areas, as refineries seek a way to offload excess product, such as jet fuel.

Floating storage is split into two categories – short term (7 days to 30 days), and longer term.

The markets for floating storage can work differently in different parts of the world.

"It was building more in Asia when I last looked at it," Mr Ahmad said.

"Asia tends to be quite a hub for floating storage. There is a huge flotilla of vessels around Singapore."

At the time of the interview in April 2020, there was a question about how much oil the tanker sector could store.

Vortexa was trying to model this, considering both the drop off in demand for tankers (due to less oil being shipped), price incentive for shipowners to provide vessels for storage rather than freight, and futures price justifying storing oil.

"Shipowners will constantly be making this decision - if it is more economical for them to put vessels into storage - or take normal cargo from point A to point B," Mr Ahmad said.

TO

Interunity – debt markets, scrubbers and 2020 perspectives

We talked to George G Mangos, director of Greek shipping operator Interunity Management Corp, about developments in the shipping debt market, how he sees tanker markets evolving this year, and how scrubbers are getting ship operators into unexpected trouble

Interunity Group is a wide reaching service provider to the maritime space, spanning technical (IMC), commercial (SOKANA) and loan management services (Burlington Asset Services – also known as BAS).

The shipping debt market is split into two areas. These are the primary market in which banks make loans to shipowners, and the secondary market in which those loans are traded between institutions. BAS services are primarily oriented to the latter sector, managing and advising on shipping loan portfolios for its institutional investors.

A leading recent example – independent of BAS - was the acquisition of HSH Nordbank's shipping loan book by private equity company Cerberus Capital in February 2018.

Banks require a well-functioning secondary debt market in order to manage risk, provide liquidity, and help price loans they are offering to shipping clients. Without these functions the primary loan market would start seizing up.

George G Mangos, a principal of Interunity Group who started his career in corporate finance, notes that banks can sell both single loans and a mixture of assets as a portfolio, and this can include everyone from "ultra-high quality established owners," to "people who basically fly by the seat of their pants," he says.

At the latter end of the spectrum, you can find "the worst category of borrower" which shipping companies paying little or no regard to their obligations towards crew and the environment, let alone servicing interest or principal on their loans, he says.

Ships are an inherently mobile asset class and the rules varying substantially in each jurisdiction, it can be hard for a lender to enforce against its security. "There are numerous ways bad actors can try to manipulate the situation," he says. "So

George G Mangos, a principal of Interunity Group

investors in this space expect a larger rate of return to compensate for the risks of the portfolio."

When asked to assess how things will elapse post-Covid 19, Mr Mangos notes that "many institutions could be nursing some pretty difficult situations. So first and foremost investors will have to put out the fire in the living room before taking on new stuff. But when the time or the price is right, there is still considerable appetite."

2020 tanker market

Looking at the tanker market overall, Mr Mangos observes that the year began well for large tankers where delayed scrubber works added to the trading bans on a substantial COSCO VLCC fleet, which effectively removed significant capacity from the market. The net effect was a shortage of supply and substantial rate rises for crude tankers.

Compounding the complexity of the tanker market, COVID-19 has brought additional challenges for tankers with severe operational difficulties such as changing crew, or big delays in repairs.

"It is all so dynamic, I don't think I remember any other time in my career like this," he says.

COVID-19 has had two further impacts on tankers. A decrease in demand would normally be terrible news for freight rates but the shortage of land-based storage to absorb the massive oversupply of crude and - to a lesser extent - product has led to a substantial increase in demand for vessels.

Even substantial cuts to oil production "will leave an overhang of a few months rather than impacting the freight market straight away," he said. "And it will take weeks to show itself in the supply chain."

From a restructuring perspective, Mr Mangos notes, the industry is still dealing with the tail-end of what he calls the pre-Lehman "wave of exuberance" where the orderbook reached an all-time high. Valuations had reached a "crazy" level as owners tried to take advantage of China's seemingly limitless growth – though the tanker sector has a significantly smaller overhang that either containers or dry bulk.

Scrubber trouble

Due to the unexpected reduced oil demand and supply glut we are now seeing low sulphur fuel oil at similar prices to heavy fuel oil. "If the price differential is only $80 a tonne – and it has recently dipped below $30 in some major ports - the payback time on a scrubber can be more than five years. I don't think anyone can say they expected this," Mr Mangos said.

According to Mr Mangos, a number of scrubber owners "locked in" the price of their scrubbers by buying HFO at a predetermined price before IMO 2020 to reduce the risk of their investment. This hedging strategy is now paying considerable dividends, while other owners who left the position "uncapped" are facing a very uncertain return on their considerable investment. TO

Signal Group – digital models of the tanker market

Signal Group builds digital models of the tanker market, based on automatically "reading" e-mails from traders and brokers, extracting data and compiling it with other data including AIS

Signal Group, based in Athens and London, is building digital models of the tanker market. It has a tool which can automatically "read" e-mails from shipping market participants about vessels available, sought or fixed. It extracts the data from the e-mails, and compiles it in a model together with AIS data and company internal data.

Putting everything together, it can create a list of vessels which are available to accept a certain cargo, and an estimate of how much the owner would earn from taking it. Shipowners can use this to assess the strength of their position in the market and whether they should hold for a higher rate.

The software also makes forecasts of demands for vessels, which can be used to predict whether the freight rate will go up or down.

The service can also give useful market information. For example, you can see what impact Libya's stopping oil exports in January 2020 had on the market availability of tankers and the rates. You can track the vessel supply and market rate over a period of time. You can see what impact VLLCs being used for storage had on the daily rates.

The service covers VLCCs, Suezmaxes and Aframaxes. It is in beta testing to expand the product for large bulk carriers, from Capesize to Panamaxes.

The software is used by brokers, charterers and shipowners. Because each company has access to a different set of information, the model is built individually for each, based only on information they have. So it can build a model based on e-mail lists they are included on, their internal data, and public data, such as AIS reports.

The software was originally developed for the company's own use, doing commercial management for a pool of Aframaxes.

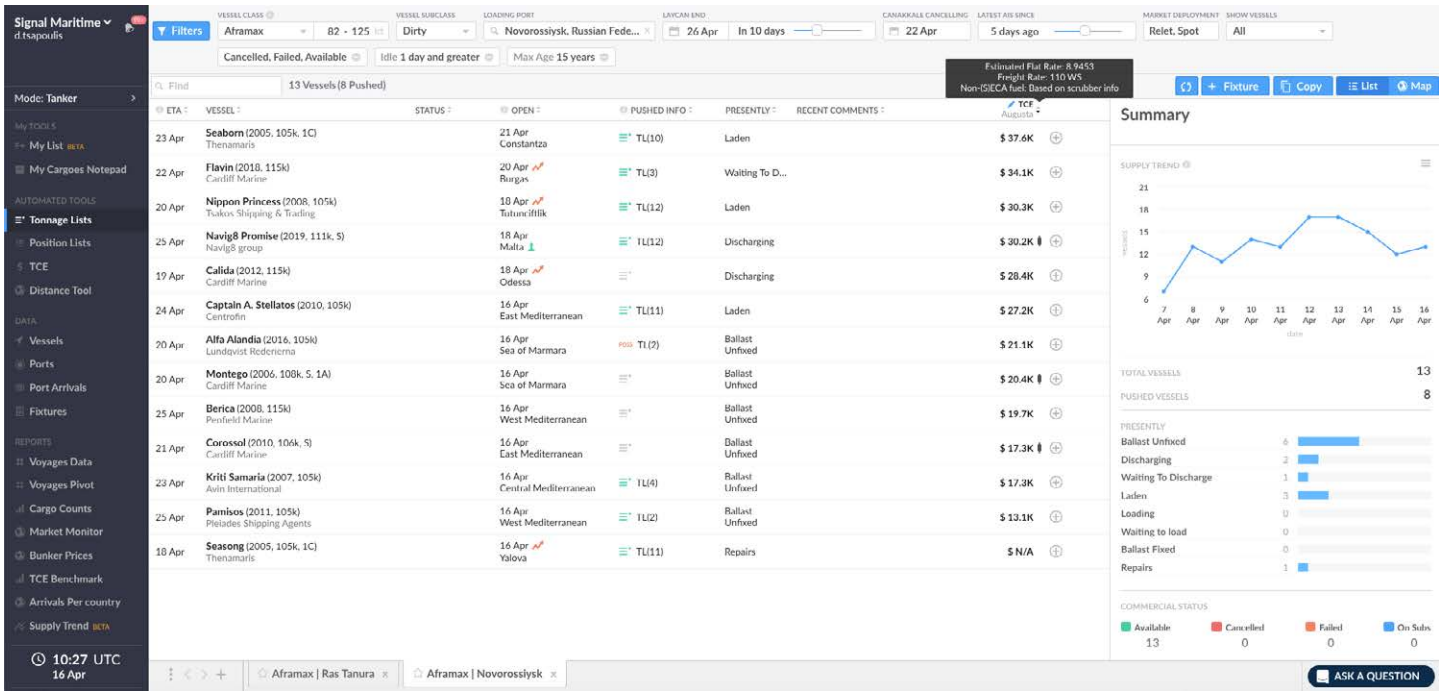
Today, there are 72 clients paying for the service.

A list of clients is online at https://www.signalocean.com/#companies – prominent tanker operators and charterers mentioned include AET, Chevron, ConocoPhillips, Delta Tankers, Stolt, Dynacom, Equinor, ExxonMobil, Frontline, Heidmar, Lukoil, Nordic American, Olympic, OMV, Philips66, Prime, Sinopec, Sovcomflot, Teekay, Thenamaris and Trafigura.

The company says it recently "onboarded" another oil major and is in discussion with another (although is unable to mention the names).

Reducing e-mail load

The first task the software does is automatically 'reading' e-mails, so



A dynamic tonnage list for the North Sea, compiled by Signal Group automatically from multiple data sources

charterers don't have to read them all.

People working in vessel chartering communicate their needs and availabilities by bulk e-mail. "The average chartering professional might get 4,000 e-mails per day which is mind boggling," says Dimitris Tsapoulis, chief Operating Officer, Signal Group.

For example, consider if a shipowner is contacted by a charterer on Friday evening looking for a vessel. The shipowner needs to consider whether the market rate is going up, because of a decreasing availability of vessels, and so should wait until Monday. Or maybe better to accept the cargo now.

If you decide to look carefully through your e-mails to read the relevant ones, then there can be another stream of more e-mails while you have done it, he says.

To understand if the market may go up or down, you need to (for example) make a list of all the vessels in the market located nearby, and cross them out when you see that one is fixed elsewhere and no longer in competition for this cargo. By the time that is done, another 150 e-mails have arrived.

Chartering managers can find themselves looking at multiple screens and taking multiple phone calls, with charterers seeking urgent vessels for transport or storage.

"You are trying to make head or tails out of what's happening," he said.

The e-mails include fixture reports (reports of vessels contracted for carrying a cargo), position lists (of vessels required) and tonnage lists (of vessels available).

These e-mails are often written in a standardised language, developed in the days of Telex and high costs per character sent, which makes it possible to program a computer to 'read' them.

For example a few words communicate that a certain vessel is likely to be chartered by someone for a certain trade, loading at a certain date, for a certain cargo, for a certain price, and whether the contract has been signed.

The computer aims to convert this standard language into a table of vessels in the market, cargoes looking for vessels, port lists and fixtures.

The company claims that its system accuracy at reading these e-mails, detecting and extracting the relevant data, is now over 95 per cent, based on a proportion of e-mail rows containing data which are successfully read.

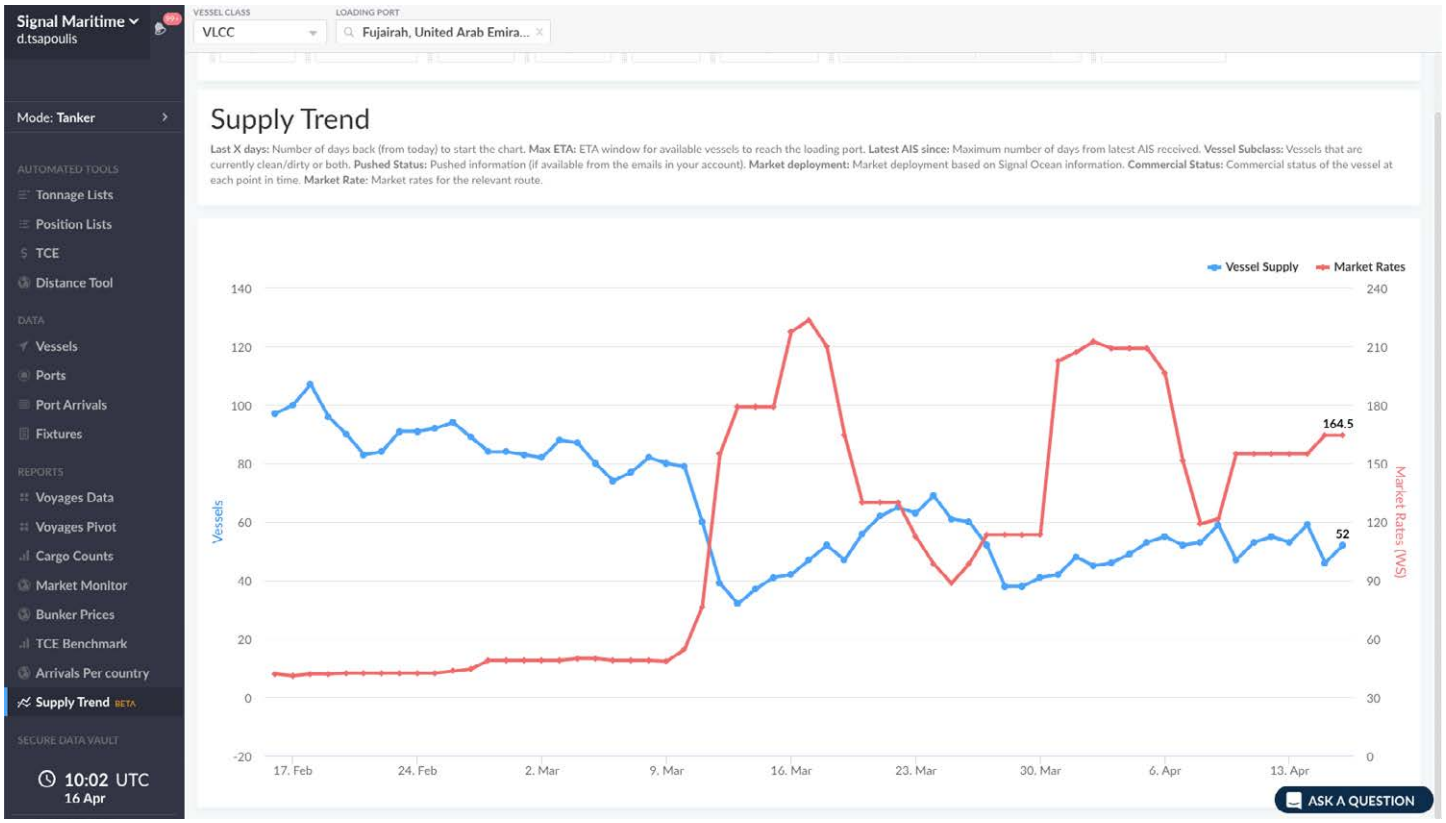
The screen shot shows an example. From a broker e-mail inbox, the computer thinks it has found a certain number of vessel positions, cargoes available, information about fixtures, and "line ups" – vessels scheduled to arrive at certain berths or terminals.

Integrating the data

But the real strength of the offering happens when the data is combined with other data to forecast vessel availability.

Based on AIS data (available as a feed by license), it can know where all the ships in a certain market (such as Aframaxes) currently are, their destination and their position history.

That is not so helpful by itself, but it can



A recent VLCC supply trend that shows strong correlation between the forecasting predictions provided by the platform and the associated spot freight rate

be used to build up a more useful picture, when the vessel will be available for another cargo and where it will be at that point.

A charterer can find the answers to questions like "which Aframax vessels can be in Ceyhan within 10 days, and are available for charter". Ceyhan is a terminal in the Turkish Mediterranean operated by BP, connecting to the Baku–Tbilisi–Ceyhan (BTC) pipeline.

This list can be further reduced with a mixture of digital and human expertise, such as looking for ships which have been advertised in the market, ships that can wait a day before loading, ships which have a status with the relevant charterers, ships under a certain age.

You can see how many ships are on "subs", as brokers say, which means that negotiations have been completed, the vessel has been reserved for the fixture, but the final contract or 'fixture' is not completed. For example if you see 8 vessels are on "subs" today, but there have been 19 over the past few days, "you know the market is quieting down," Mr Tsapoulis says.

It also tells you that the vessels not fixed or on 'subs' are available for charter.

Then you can do further analysis on these vessels still under consideration.

You can see how much profit each shipowner would make, based on a "Time Charter Equivalent" calculation, a shipping industry performance measure, based on a calculation of voyage revenues minus voyage costs, divided by the number of days of the round-trip voyage.

"Instead of ranking them by the time they arrive in the port, I've ranked them by who stands to have the biggest margin," he says.

You can see a previous voyage and an estimation of how much profit or loss was made.

Shipowners can use this to compare their competitors' performance, for example they may see that a company is operating an "eco ship" with higher fuel efficiency and making more money that way.

It can assess the merit of the full commercial voyage, including moving the ship from where it finished the previous voyage to where it will collect the next cargo. So clients can get a full understanding of whether a cargo will be profitable to take.

"You can do all this without reading 1000 e-mails," he says. "You can have it all on your phone."

Brokers

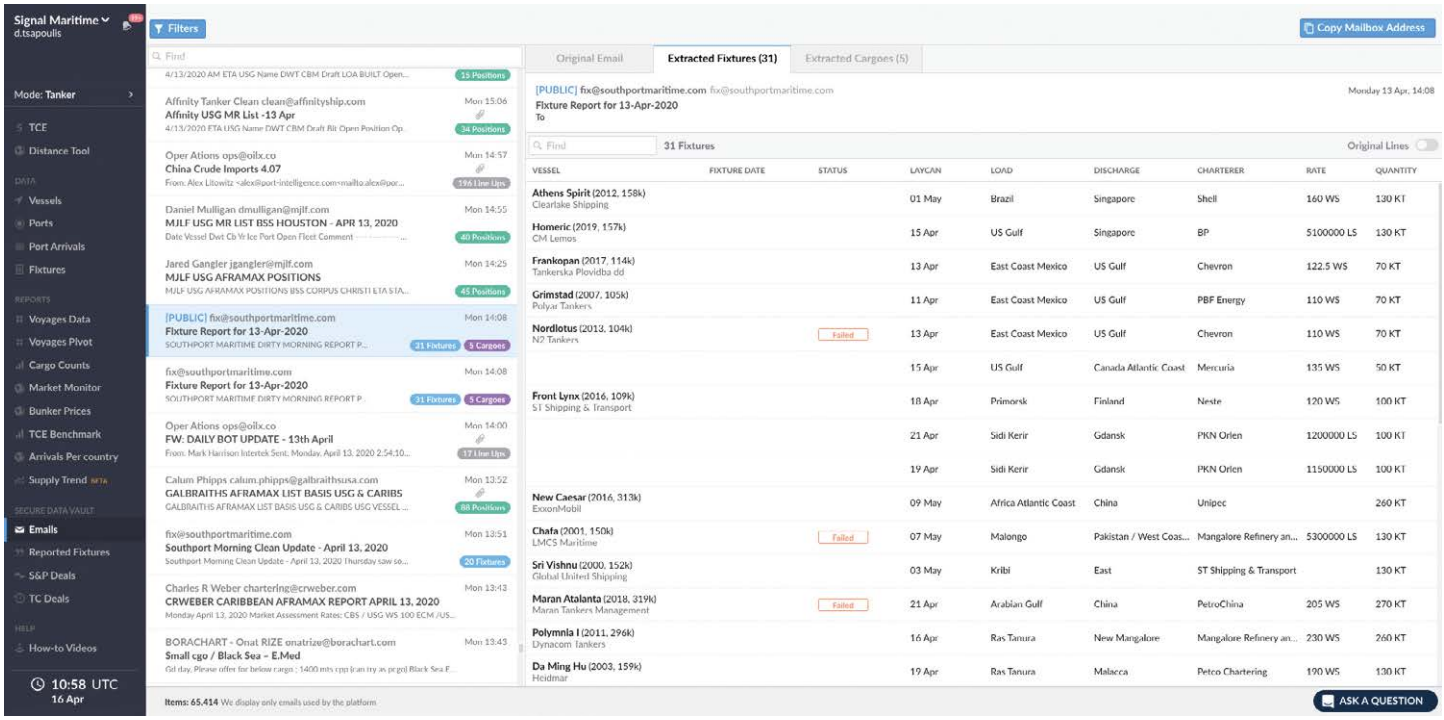
Mr Tsapoulis emphasises that the service is not intended to disintermediate brokers, but to give market participants better tools – in the same way that real estate market players have a range of tools, but still use agents.

TOTAL Lubmarine

Navigating 2020 and beyond

Engage us, **challenge** us
totallubmarine.com

TOTAL
Committed to Better Energy



Email data extraction - the computer has automatically identified "Positions", "Line Ups", "Cargoes" and "Fixtures" in the broker e-mails

"Brokers are the information lubricants of the market," Mr Tsapoulis says.

Brokers are finding this very useful in complementing what they do.

It could be a service entirely for brokers, who would then advise shipowners and charterers about opportunities – although it doesn't hurt for all market participants to have this information, he said.

Pool management

The other part of Signal's business called "Signal Maritime", is managing a pool of 35 Aframax vessels.

"It is not a traditional pool, it is a pool that is very much focussed on achieving overperformance on TCE [Time Charter Equivalent earnings], so bringing a new value proposition to owners," he says.

The company estimates that vessels in the pool earned an extra $2,000 per day compared to competitors.

Shipping companies can place ships in the pool just for a single voyage. "It is dramatically different to the average commitment that pools look for," he says.

By joining the pool, other owners can gain the value of Signal's technology without setting it up on their own systems.

Earnings from pool ships can be shared among participants of the pool.

Company background

Signal was created by an original team of about 11 people who moved on from tanker operator Thenamaris to create the company in late 2014. It was launched at June 2018 in Posidonia.

As of April 2020, the company employs 108 people, 60 on technology development, and 48 doing commercial management for a pool of Aframax vessels.

The CEO of Signal Maritime, Ioannis Martinos, is a former co-ceo of Thenamaris

Until 2019, the system was limited to VLCCs, Suezmaxes and Aframaxes, but now it has data about the full merchant fleet of 35,000 vessels, including all tankers, dry bulk down to 25,000 tonnes, LNG and LPG vessels, and some expansion into containers. The dry bulk service is having a beta release, covering capes to panamaxes.

TO

THOME GROUP

YOUR FULLY INTEGRATED MARITIME PARTNER

SAFETY | COMPLIANCE | EFFICIENCY

SHIP MANAGEMENT
OFFSHORE MANAGEMENT
OIL AND GAS
MARINE CONSULTANCY

CREW MANAGEMENT
SHIP AGENCY
CORPORATE SERVICES

www.thome.com.sg

ThomeGroup

2020 Dry Bulk Operator Award GREEN4SEA

Winner Excellence in Maritime Services/Ship Management Thome Group

Seatrade Maritime Awards Asia WINNER Ship Manager Award 2019

MARITIME SINGAPORE

ABS – remote surveying moves ahead

Some survey tasks don't actually require a surveyor to attend the vessel. Class society ABS has been building its remote survey offerings

Class society ABS has been gradually building up its remote survey offering since 2018, and now says it has "the most comprehensive offering in the market".

The most important vessel surveys will probably always need to be done in person, by a surveyor on site. Surveys are required by regulations to assure vessel compliance with applicable Rules and Regulations. A fraudulent shipowner may be inclined to submit false documentation, so surveyors need to see the ship with their own eyes.

But some of the "occasional surveys" are a review of documentation.

Consider the Continuous Machinery Survey, a review of machinery systems on the vessel made on a 5 year basis, such as an engine or seawater pump.

The surveyor does not need to see the equipment itself, but needs to verify that maintenance has been done.

The work involves a detailed review of data provided by the chief engineer, or in some cases, ABS can gain direct access to the planned maintenance system.

Getting a surveyor onboard a vessel is difficult in the best of times, and much more so today, says John McDonald, Senior Vice President of Global Business Development with ABS. Sometimes it can involve a special port call.

"The big intent is to reduce downtime for clients so they can keep moving."

The remote survey offering makes use of video and photography where possible, and both can be taken by the crew themselves, and sent to ABS' Decision Support Center.

And as vessels are fitted with more and more sensors, there are more possibilities for this sensor data to be used as part of a survey.

Policies and rules define what is acceptable, in terms of meeting the requirements for classification, set out by ABS' Chief Surveyor Office and our rule Committees. These requirements are consistent across the ABS organisation. Whether it is a survey onboard or a remote survey, it is the surveyor who decides whether the asset in question meets the intent of the rules," he says. Further is should be noted, the remote survey was designed and is intended to be no less effective than physical survey attendance.

ABS is expanding remote survey capability as rapidly as possible, and wants it to become a standard way of doing business as a complement to physical surveys, not just something for very unusual circumstances.

"We're always looking at how we can use new technology in remote monitoring and verification," Mr McDonald says.

In a survey of 200 industry leaders who participated in ABS webinars on remote surveys held in March 2020, more than 92 per cent said they "believe remote techniques can be as effective as physical surveys" and 100 per cent said they believe "remote surveys improve operational efficiency." All respondents said they wanted increased remote survey options.

In April 2020, ABS announced that it is able to conduct "almost all" annual classification surveys remotely, but these additional remote surveys were not available to tankers, only general cargo vessels, tugs, offshore support vessels and liquefied gas carriers under 15 years.

Examples of remote surveys

A Safety Radio Survey is normally done by a specialist radio technician approved by the class society, to verify that the radio equipment has been calibrated and tested. It can be done remotely if the Surveyor can see technician reports and attestation from the Master to verify that radio equipment has been properly examined. For statutory remote surveys, ABS seeks the authorization from the Flag Administration.

The Condition of Class is a finding, perhaps lasting for one voyage, saying that the ship has a certain defect, but is allowed to continue sailing provided the defect is repaired by a specified date, and in the interim certain temporary arrangements are put in place.

The Dry Dock Extension is to extend the required Dry Docking survey up to three months beyond its due date.

A Tail Shaft Extension Survey is a review of a request for a 3 month extension of the 5 year period between tail shaft surveys, as rules allow. This can be done just with a review of service records and test records, which does not require someone onsite.

John McDonald, Senior Vice President of Global Business Development with ABS

Other surveys available remotely are Concurrent Load Line, Minor Damage Survey, Boiler Three Month Extension.

Underwater Survey

The Underwater Survey (UWILD) is now available for vessels as well as offshore assets and so will be of interest to tanker operator readers operating tankers less than 15 years of age.

The survey is done by a diver with an underwater camera or an ROV following live direction from a surveyor. But the surveyor does not need to be physically on the vessel to provide this direction.

It means surveyors can save a large amount of time from not having to fly to the offshore facility themselves.

The In Water Service company would typically have a land based facility for monitoring work, and the class surveyor could sit there to monitor the video images together with the dive management team.

The surveyor may ask a diver to take further imagery of something, so a closer look may be taken.

ABS specifies the minimum allowable video quality in terms of frame size and frames per second, and minimum voice and video communications lag (6 seconds). TO

COLUMBIA
SHIPMANAGEMENT

FOCUSED ON EXCELLENCE

Discover our innovative and complete range of maritime services at:

www.columbia-shipmanagement.com

Singapore | Shanghai | Hamburg | Cyprus

Reports of battery explosions on tankers

There have been a number of reports of battery explosions onboard vessels, with potential for human injury and fire. Shipbuilding consultant Narayana Prakash explains how they can happen and what to do to prevent them

By Narayana Prakash, maritime shipbuilding consultant

There have been numerous incidents of so-called "maintenance free" batteries catching fire and exploding on board ships.

Fortunately no-one has been injured from these incidents.

However such explosions have the potential to inflict serious injuries, such as permanent blindness and permanent skin damage, and can be the cause of fires.

In each instance, the batteries involved were the larger automotive 'maintenance free' type with no provisions for periodic topping up with water of the electrolyte (internal acid fluid). The exploded battery was under warranty.

The explosions have typically occurred several months after the battery was installed.

An unsafe condition may be created when a battery cell has a high concentration of hydrogen and gas due to a plugged or defective vent cap.

Also, overcharging the battery can result in electrolysis in the electrolyte (water and acid) – creating hydrogen and oxygen.

If enough hydrogen and oxygen accumulates in the battery, then vents out from the internal pressure, when it comes into contact with a spark, it will explode.

"Maintenance free" is a carefree description for starter batteries. Even where batteries do not require periodic water additions, maintenance requirements still extend to charging, cleaning battery tops, periodic re-tightening of battery connections, testing to confirm the working condition of the battery.

The "maintenance free" battery also loses water due to evaporation. Wherever there is an opening provided to top up the battery with water, topping up must be carried out.

During inspections

One explosion took place while a vetting inspector was onboard an oil tanker and witnessed during his presence.

The ship staff had been carrying out safety checks onboard ship, including trying out the emergency generators.

The panic situation coupled with blame games made all the ship staff demotivated.

In most cases of the observed explosions, the emergency generator would not start at the first attempt, leading to checks on terminals and battery circuits.

But the repeated attempted starts will increase the sparks and waiting hydrogen for explosion.

If this happens while a Port State Control or vetting inspection is in progress, you should request the inspector carry on with other inspections and in meantime investigate the issues.

An exploded battery on a ship

Suggested control measures

These control measures are suggested for starter batteries.

On board ships the battery can be placed in an enclosed box with sufficient ventilation provided for the gases to liberate out freely.

Eye protection can be used whenever handling battery maintenance activities.

The capacity of the battery should be carefully selected at design stage. In no case it must be of insufficient capacity.

The battery charging circuit should provide constant voltage. When operated at the recommended charging voltage, they maintain the battery at or near full capacity and provide automatic replenishment of charge following a discharge.

Use a battery that has provisions for periodic top-ups with water, and provision for monitoring of liquid levels in all cells.

Any bulging of the battery within the warranty period should be reported and battery discarded immediately.

Sparks are mostly generated from slip on type connections. The wasted terminal is normally wound with copper strips to tighten again and the dangerous situation arises. Nut bolt tightening is better.

Operating starting batteries at temperatures above 25ºC will lead to higher water loss and shorter service life.

It would be prudent to place an instruction regarding periodic battery level check and top up of distilled water if required near Emergency and GMDSS Batteries.

Investigation

One investigation by an equipment manufacturer said there was less electrolyte in the battery. The plates inside the battery collapsed and touched one another causing short circuit.

The underlying cause was that the periodic check for electrolyte was not done in the last several months due to the battery being termed as "maintenance free." TO

Narayana Prakash is Chief Engineer and Ship Building Consultant having worked in various shipyards in China/ S Korea/ India/ Netherlands/Romania, in new construction of various types of ships. For New building queries : He can be contacted at -getnp65@gmail.com

MarineShaft - "Many Tanker Operators don't realise they can repair shafts"

Many tanker operators do not realise that it is possible to fix propeller shafts which have got bent, opting instead for an expensive replacement

The shaft of a tanker – which connects the propeller to the engine – can get slightly bent if the vessel has a minor knock, such as a propeller hitting an obstruction, or if a bearing fails. This means an urgent repair, because an engine cannot drive a propeller through a bent shaft.

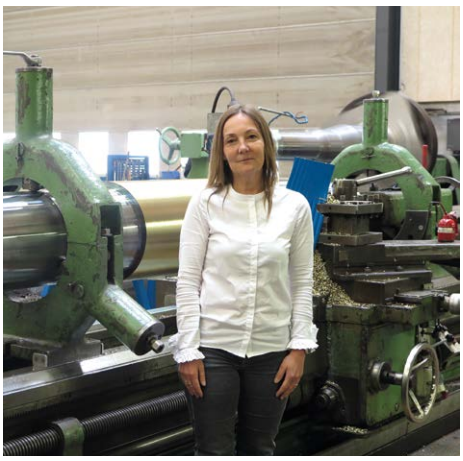
Tanker operators often assume that they need to buy a new shaft, and wait while it is made. A complex repair also means higher stakes in any discussion between parties involved in the accident, so a difficult negotiation.

But MarineShaft of Hirthals, North Denmark, has a business doing "cold straightening"- straightening out the existing shaft.

Marine Shaft says it has carried out a number of repairs on tankers. They have been repairing shafts for more than 50 years.

It can also apply to the shafts which connect steering to rudders, known as rudder stock.

"I think it is important for any operator to know the straightening repair possibility – regardless of the type of vessel, because you never know if you might need it," says Hanne Magnussen, marketing manager of Marine Shaft.



Hanne Magnussen, marketing manager of Marine Shaft

Straightening a shaft

Straightening can save time, money, and also achieve environmental benefits.

The worst bent shaft the company ever repaired was 1000mm out of line. The vessel had hit a rock off the Norwegian coast, and suffered extensive propeller shaft and rudder damage. The propeller shaft was blocked in turning, and pulled approximately a metre out of the stern tube, becoming heavily bent.

Marine Shaft straightened the shaft to 0.02mm out of line – where a new shaft can be up to 0.05mm out of line. "We are talking very narrow numbers here – the thickness of a hair," she says.

The manufacturing of a new propeller shaft can take several months. But the shaft could be repaired within a couple of weeks.

But even slightly bent shafts need to be straightened, otherwise they cause vibration and damage, she says.

If there is any vibration, it could turn out to be a huge cost saver to check the shaft alignment.

MarineShaft can straighten shafts from 20 mm up to 1,500 mm in diameter, and no limit to in length. They use a hydraulic press, designed and built in house. The maximum press capacity is 8,000 tonnes.

The company has propeller shafts and rudder stocks sent from all over the world. Time and price quotations can usually be provided based on photos.

In many cases the work can be completed in a few days, much faster than the time to make and deliver a new shaft.

The know-how of how to straighten shafts is kept as a company secret. It is not "something you learn by book," Ms Magnussen says.

The process is fully approved by "all major classification societies" and considered as a permanent repair, equivalent to a new shaft. The service includes thoroughly inspecting the shaft for cracks.

It does not adversely affect the metallurgy of the shaft material – because the straightening can actually release stress from the material. Although other straightening methods do put stress on the material.

The equipment is hydraulic presses with numerical control and sensors.

An article published in the in-house magazine for insurance company GARD said that large diameter shafts are often subject to bending, which can occur during manufacturing, processing or in subsequent use.

Psychometric assessment for crew recruitment

Psychometric assessment can be useful in crew recruitment in finding people with the right behaviour social skills and leadership abilities. A managing director of a crewing agent explains how it can work

By Henrik Jensen, founder, Danica Crewing Services

Everyone can agree that it is very important to have crew who have the right set of knowledge and skills to carry out their roles.

This is particularly paramount for tanker owners.

If the crew do not perform and act in a safe manner and do not follow correct procedures, then the vessel is unlikely to pass vettings, the consequences of which could be as serious as owner going out of business.

Even a wrong act by a single individual crew member can cause this.

For tanker owners it is crucial to have crew onboard with sufficient intelligence, talent and personal characteristics to enable them to perform these tasks in the challenging situations they meet onboard.

While possessing the right competencies is important, it is also crucial that those senior crew members have the ability to apply and share these skills with others.

In particular, top officers must be able to lead, to mentor and to be able to cope under pressure.

But how do you ensure that your vessels' leaders are up to the job?

Danica places so much importance on leadership that it has factored these skills into its robust interview process.

Our interviewers are trained in interview techniques and we have a catalogue of questions which we ask to get clear indications on how a candidate behaves in the job.

Psychometric assessments

In addition, in Danica we have taken the process one step further by incorporating psychometric assessments as a part of the assessment process for senior officers.

Danica uses a robust, proven system intended to be used for middle level managers.

The candidate completes a questionnaire online which generates an inventory report of the persons behaviour, social skills and leadership abilities –as a person, in their professional role, and under stress.

Trained and experienced members of the recruitment team interpret the results, giving a clear and rounded picture of the candidate.

We use the result of the assessments as a supporting tool to verify the information and the impression we got during the initial face-to-face interviews.

The assessment result is not a simple 'go or no-go' verdict. During the interview we compare the answers and behaviour of the candidate with the results and, combined with our own impression of the person, we get a much better understanding of the candidate's ability to perform.

Henrik Jensen, founder, Danica Crewing Services

We then give guidance to the candidate on how they can improve their leadership skills and professional social behaviour.

Some aspects are ingrained in their personality. But many skills and competencies can be changed just by the person being aware of that there is an area for improvement.

Interpreting results

The assessment has to be carried out with care, taking a number of factors into account. A sound knowledge of the maritime sector and the roles onboard vessels is essential when applying such assessments to crew members.

For example, a good characteristic for a Chief Engineer, for whom fault-finding is an essential part of the job, is that they think logically and carefully, checking things step-by-step, following procedures and basing their decisions on facts.

Psychometric testing results often show Chief Engineers as systematic persons who want facts before making decisions – which means that such assessments can unfortunately identify them as slow decision makers.

Of course this is natural for them. Indeed, very few people have the ability to collect all the facts and process them accurately within a very short period of time – in fact, only fighter pilots function at that level!

Therefore, in a maritime setting, it is important to use such assessments to verify that the candidate is within the normal expected range for that role and rank.

I see some employers making the mistake of hunting for Mr Perfect – who is impossible to find! Instead screening and assessment should be used to filter out persons who have a high risk of failing in the role.

The results have to be interpreted carefully. For many candidates the result reveals that they are insecure and frustrated. This is not necessarily a negative – in fact it shows a normal reaction.

If we have been working for the same employer for a period of time and suddenly are made redundant and need to search for a new job, then it is very natural to be frustrated.

If a person in such situation is not frustrated then it could mean that they actually don't care who they work for.

When we evaluate the assessment we look for whether the candidate has a balanced set of social skills.

Are they able to behave in a way that encourages others onboard to accept them while still maintaining the necessary distance and authority needed by a senior officer in order to manage the human environment onboard?

We also look at how the candidate reacts under stress and how persistent they are.

For some candidates, stress improves their performance but for others the results show that they start to make short cuts. This is where have to be careful and we will drill into this during the follow-up interview to verify or clarify the results.

It is also important to share the result of such assessments with the candidate. We show the results to our candidates and in all cases they agree with us that the results, to a very large extent, show who they are.

In some cases, particularly for younger Chief Officers and Second Engineers, we also discuss how they can improve their behaviour to develop into being excellent Captains or Chief Engineers – so it is beneficial to their career path too.

We refer to our procedure as an 'assessment' and not a 'test'.

That is because there are no right or wrong answers to the questions and it is not about fail or pass.

It is about putting the right people in the right job and giving them the right amount of training and support to enable them to carry out their role to the very best of their ability.

MCTC – catering services to vessels doubling in 3 years

MCTC of Cyprus reports that it has doubled the number of vessels it provides catering services to in the last 3 years, now serving 600 vessels, including Hafnia Tankers, BW, Columbia Shipmanagement and Peter Döhle Group.

MCTC of Cyprus reports that it is now providing catering management services to approximately 600 vessels, including Hafnia Tankers, BW and Columbia Shipmanagement, twice as many vessels at it served 3 years ago.

In February 2020, the company announced a new contract to provide catering and training programmes with the Döhle Group, operating over 100 vessels.

MCTC has a unique business model, combining being a supplier of food to ships, training shipboard cooks, and providing consultancy on how companies should put their menus together.

Where some shipping companies might leave it to the procurement department and shipboard cooks to make decisions about what to buy and how to go about it, MCTC makes a comprehensive program.

Consider it similar to how many restaurant chains have a schedule for the food they order, the menus and recipes, and the processes for how food is prepared.

Training

MCTC provides training to its customers, as part of the catering management service, not charged additionally.

The company reports "hundreds of crew" signing up to its webinars on COVID-19 and food safety management onboard.

It saw an increase in galley crew signing up to its 10 week distance coaching program "Safe Food Handling and Nutrition" – covering food safety management and hazard management.

Crew can take the courses from onboard the vessel. It has a distance learning course certified by the Cyprus Department of Merchant Shipping.

With physical training centres closed or inaccessible due to Covid-19, the online training is becoming more popular.

The company's consultants also visit vessels and review practices in defrosting food, storing leftovers, preparing meals and basic hygiene, and give advice to cooks about their choices and health approaches.

Good food onboard

Ship crew can choose from 100 weekly menus, or 2000 individual recipes, all of which can be cooked from food they have onboard. They can plan a new weekly menu for each week. They can order the food to be delivered from MCTC's website.

This includes menus catering to European, Indian, Philippine and many more national tastes and cultures.

A core rationale is that good food does not need to be expensive.

For example, cakes can be made onboard with better quality ingredients than you might find in pre-made cakes. The same for soups. And buying ingredients can be less expensive than buying packaged food.

Conversely, spending a lot of money on food does not mean that crew have a good eating experience.

"Expensive items can be treated very badly onboard," says Christian Ioannou, managing director. "It is important to handle food properly."

The quality of shipboard cooking can come down to how motivated shipboard cooks are – but also how well supported they are to do a good job – just as with any restaurant cooks.

It is useful for cooks to get feedback from the captain and a 'steering committee' onboard – including so they can get praise for particularly good efforts.

To improve motivation, every year, MCTC runs a cooking competition for shipboard cooks, with a winner chosen from each company fleet. The food is judged based on photographs of it, a consideration of the innovation which went into it, and evaluations from the captain and crew.

Mr Ioannou believes that younger generation crew often rate healthy food more highly than older crew. Also 40 per cent of young people are either reducing meat intake or have gone vegetarian, he says. So they seek out employers able to provide proper wholesome vegetarian meals.

Customer testimonials

An Janssens, crew training co-ordinator with Exmar Ship Management, said "MCTC helps us to further develop our cooks' catering competencies, both via supported e-learning onboard and through the Maritime Catering Development Programme ashore. We are happy with their smooth organisation and communication."

Dennis Svane Hansen, VP and head of global manning with BW Fleet Management, said, "the positive feedback and appreciation that we commonly receive from our Shipboard Management Teams following a visit onboard by MCTC is proof of the professional and high quality service that they deliver. MCTC consultants has a very practical approach and a genuine interest in further developing competencies and practises onboard."

Captain Faouzi Fradi, crew training manager with Columbia Shipmanagement, said "I needed to find a competent catering training provider to help us improve our standards in selecting and fine tuning the competencies for various positions onboard our managed cruise ships. I am happy to have come across MCTC and started working together since Jan 2016. Their hard work professionalism, patience to meet all our high requirements and general approach to this project was admired by all involved."

Björn Borbe, senior manager crewing with John T Essberger, said "the training concept of MTCT with its sustainable, practical and personal approaches has been proven to be a convincing method to improve the competence and skills of our catering personnel onboard our fleet. What makes the concept of MTCT unique is not only the different types of training, such as e-learning, onboard visits and tailor made courses, but also the personal dedication of the MCTCT team which served to develop personal relationships with our crew."

Uta Steffen of JPC Shipmanagement (Cyprus) said "JPC started the MCTC Safe Food Handling and Nutrition Course on a few vessels mid 2016 and extended the program to the whole fleet 6 months later. Their unique consultancy service with clearly defined targets of each training module is very hands on and does not only contain practical theoretical modules, but also onboard visits which we find very useful." TO

Developments with scrubbers at Pacific Green

By Scott Poulter, CEO, Pacific Green Technologies

Pacific Green Technologies (PGT) of Dover, Delaware, has spent more than a decade designing, planning, manufacturing and implementing scrubbers on vessels.

Its "ENVI-Marine" exhaust gas scrubbing device can be supplied as an open loop, open loop hybrid-ready or hybrid system capable of both open and closed mode operation.

Open loop scrubbers are best suited for tankers, reflecting the fact that the vessels are mostly operating on deep sea routes and ports outside ECAs (emissions controls areas).

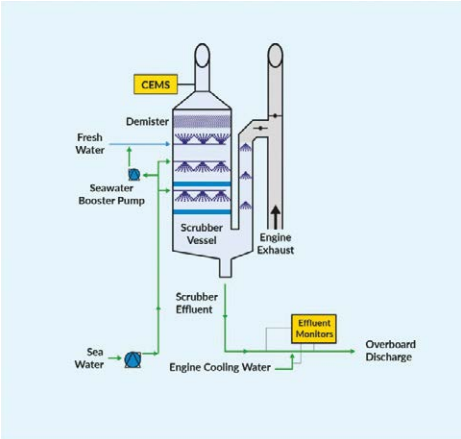
In an open loop scrubber, the exhaust gas in the scrubber is treated with seawater, producing sulphuric acid.

The system relies on seawater alkalinity. The alkalinity of seawater neutralizes the acid and the treated washwater can be discharged into the sea. There is no need for alkalizing chemicals and no requirements for shoreside disposal or for the treatment of washwater.

ENVI-Marine is smaller, more efficient and cheaper to install than many competitor's products.

Its "TurboHead" technology creates an interactive contact between the seawater and the exhaust gas in a turbulent zone containing a high amount of surface area for gas/ liquid absorption.

This high energy liquid/gas interaction ensures both the residence time and complete interaction required to achieve the high efficiency removal of sulphur from the exhaust gas and the extreme turbulent interaction transfers the particulate matter from the gas to the scrubber fluid.



The Pacific Green scrubber flow diagram

Scott Poulter, CEO, Pacific Green Technologies

Naked scrubber

Building on its success and responding to shipowners calls for lower CAPEX and OPEX levels, PGT has taken the ENVI-Marine system one step further developing a new 'naked scrubber'.

The 'naked scrubber' is an enclosureless stainless steel scrubber which offers further cost savings, a faster retrofit turnaround time - cutting the dry dock installation costs by at least 20%, offering a low-risk installation process and a 15% reduction in weight and lower energy requirements.

Using the same technology as the ENVI-marine, the new naked scrubber is more efficient, using less power and offering considerable cost savings.

PGT's scrubber orders

To date PGT has installed scrubber technology on more than 60 vessels and has more than 90 orders in the pipeline.

In the twelve months leading up to the IMO 2020 implementation date, PGT saw demand steadily increase, with enquiries coming in from all types of vessels - bulkers, tankers and container.

Since the beginning of the year, PGT's enquiries have been for larger vessels, with more bulkers – panama, capsize, handymax sizes, and more installations on order for VLCs, suezmaxes, aframaxes and MRs.

Looking ahead, China is starting to manufacture again and thanks to its joint venture with the massive state-owned engineering company PowerChina, PGT will be able to return to its full manufacturing capacity, producing one scrubber every 48 hours.

Strong environmental credentials are likely to become increasingly important for tanker operators, which can only be a good thing for scrubbers. They offer environmental compliance exceeding all other solutions alongside operational certainty.

Scrubber background

At the beginning of this year, most of the world's shipping fleet switched from using high sulphur fuel (HSFO) to using low sulphur fuel oil (LSFO), to comply with the International Maritime Organization's (IMO) global sulphur cap.

Faced with various options for compliance a large number of shipowners – 14 per cent of the world's fleet - opted to continue using HSFO and to fit an exhaust gas cleaning system or 'scrubber' to their vessels, in order to comply with the sulphur cap.

Scrubbers offer the most effective way of reducing the pollutants that contribute most to a wide range of serious health problems.

They remove the sulphur oxides from the exhaust gases of ships' engines and boilers as well as up to 94 per cent of particulate matter, up to 60% of black carbon, and a significant amount of the polycyclic aromatic hydrocarbons.

As a result, and following considerable scientific analysis and scrutiny, they have been endorsed as an approved method of compliance by the IMO, European Union and US Environmental Protection Agency.

Many shipowners using LSFO have faced significant supply and quality issues.

Some of the new LSFO fuels have caused engine and equipment damage as engineers adapt to operational challenges resulting from different chemical constituents, leading to unscheduled vessel downtime.

Refineries are still producing HSFO and the supply chain is well established, in comparison vessels relying on LSFO have not always found supplies to be readily available, facing shortages, delays and drawing the attention of regional authorities.

TO

Bio / synthetic LNG "viable" for ships – CE Delft

It would be possible to make enough bio and synthetic LNG to power all ships, at costs similar to those of other low and zero carbon fuels, a study by CE Delft finds

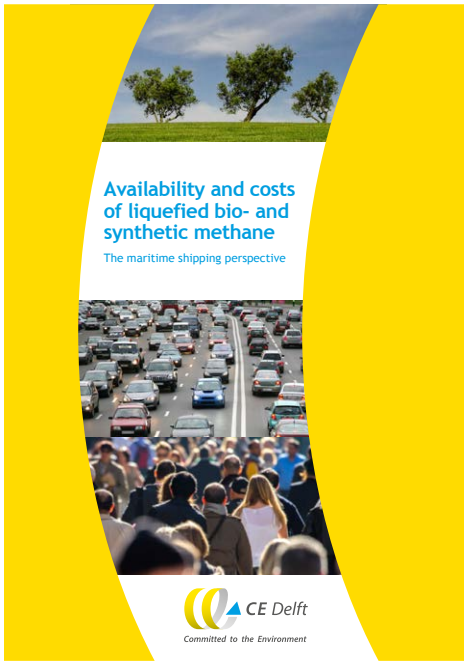
A study by Dutch environmental research organisation CE Delft has found that both bio and synthetic LNG can be "viable" as a ship fuel, providing a pathway to decarbonisation.

The study was commissioned by SEA\LNG, a shipping industry coalition with a purpose of accelerating adoption of LNG as a marine fuel.

The main constituent of LNG is methane, and so bio LNG would be made from liquefying bio methane. Similarly, synthetic LNG is made by liquefying synthetic methane.

Liquefied bio methane (LBM) means gas formed from biological methods (such as rotting vegetation or rubbish), which is then liquefied. The source material is known as "biomass".

Liquefied synthetic methane (LSM) means gas formed by reacting hydrogen with CO2 and then liquefying it. The hydrogen could be formed from electrolysing water with renewable energy, and the CO2 could be captured from a CO2 flue gas elsewhere.



Although LNG has lower CO2 emissions than liquid fossil fuel (oil), it still involves CO2 emissions – it is 90 per cent methane (CH4) with smaller amounts of ethane (C2H6), propane (C3H8) and butane (C4H10), and all the carbon atoms end up as carbon dioxide.

But if the methane is made synthetically with CO2 which would otherwise have been emitted elsewhere, such as from the flue gas of a coal power station, burning it in a ship engine makes no net additional CO2 emission.

If the methane is made from biomass, the CO2 emitted when the methane is burned originally came out of the atmosphere, being absorbed when the biomass was growing, so there is no net CO2 addition to the atmosphere.

The study concluded that both LBM and LSM could be "made available in sufficient quantities to make a contribution towards future decarbonisation for the shipping industry, and that the costs need not be significantly higher than those of other low- and zero-carbon fuels."

"Estimated sustainable global supplies potentially exceed the demands of shipping in the future, and are likely to be commercially competitive relative to other low- and zero-carbon fuels," the study found.

An advantage of using these fuels over other low carbon fuels is that they could power existing LNG vessels without any major modifications, and use an existing fuel supply infrastructure for LNG.

Research

The study looked through around 150 academic and industry publications.

It looked at the global availability of biomass, including from energy crops, agricultural residue, forestry products and residues, and concluded that there is enough to "exceed the global total energy demand of the maritime sector."

It did not include aquatic biomass, such as algae grown in the ocean, in the study, although this could "play a dominant role in the long term".

The study acknowledged that other industry sectors might also want the methane, and there would need to be "significant investments in production capacity".

The study estimates that the production costs of LBM and LSM will be "broadly comparable to other renewable fuels like green hydrogen and ammonia" – but LBM / LSM will have an advantage in that they can be handled using the existing infrastructure.

It said that the availability of LSM will be dependent on how much renewable energy gets built. An alternative pathway is that hydrogen from renewable energy could also power ships directly, or be used to make ammonia for ship fuels.

Future of LNG

SEA\LNG estimates that the greenhouse gas benefits of LNG fuelled compared to liquid fuels are 21 per cent on a "well to wake" basis, covering all emissions from the oil and gas well to the vessel's propulsion.

"If we are to make effective, meaningful progress with emissions reductions, waiting for the 'perfect' solution is not an option. We must act today, and LNG is the only option that both provides considerable GHG emissions reductions now, while charting a clear pathway towards a sustainable future for the shipping industry."

"Confusing and countering claims abound for different zero-emissions technologies – all of which require decades of research and development before they are proven safe for marine operations, globally available, and commercially viable," says Peter Keller, chairman of SEA\LNG.

The full report is available at **https://sea-lng-updates.com/**

JOTUN

Jotun Protects Property

GET THE FLEXIBILITY TO CARRY DIFFERENT CARGOES

Tankguard Flexline. Full-on flexibility for your cargo vessels.

In today's competitive marine environment, it's vital to obtain the commercial edge. Tankguard Flexline is a cargo tank coating with Flexforce technology, giving your vessels the flexibility to carry different cargoes – essential when only aggressive cargo types are available. More different cargoes. And less ventilation days after carrying aggressive cargoes. The result? Full flexibility, which means a full cargo vessel, and that's great for your business.

Get flexible. Get Tankguard Flexline.

jotun.com/tankcoatings

Tankguard | FLEXLINE

Lean Marine – automated tools to manage fuel consumption

Lean Marine of Gothenburg, Sweden, makes an automated digital device which runs on the ship's bridge, to ensure that the vessel never uses more fuel than planned , and to automatically adjust the propeller pitch

Lean Marine of Gothenburg, Sweden, makes a hardware device "FuelOpt" which runs on a ship's bridge, ensuring that vessel consumption is never higher than planned on a tonnes per day basis.

Also, if the vessel has a controllable pitch propeller, it can automatically adjust propeller pitch for optimum operations.

The device is also able to transmit information about vessel operations, which can be analysed in cloud software and made available to fleet superintendents, in a tool called "Fleet Analytics".

FuelOpt

FuelOpt is a hardware device which runs on the ship's bridge, adjusting the speed of the vessel to ensure that it does not go higher than a planned maximum fuel consumption per day.

In bad weather the engine will have to work harder to keep the set RPM, which leads to higher fuel consumption. With FuelOpt set to a maximum consumption this will not happen, but RPM will instead be reduced, and fuel consumption be limited.

It does not override any of the crew's ability to control the vessel, but is designed to make crew's life easier, replacing the need for a person to constantly monitor and make manual adjustments nonstop. This is an arduous task, prone to be affected by human error, says Sarah Zitouni, business development manager, Lean Marine, and a mechanical engineer.

"FuelOpt is an extension of the hand of the bridge crew," she says. "To have maximum efficiency of the vessel, in theory, you should be regulating all the time. For a human, this is close to impossible. We put a machine on the bridge to do that."

As an "on top" propulsion control system FuelOpt sends orders to the propulsion system, similar to how a crewmember would. It does not bypass any safety system onboard. The system receives information from the vessel Integrated Automation System (IAS), which most tankers have, Lean Marine says, similarly to how a dynamic positioning system works.

Some vessels have an "eco speed" or "slow steaming" option – but in this case, there is no way for seafarers to check what the system is actually doing, Ms Zitouni says. "What if that speed doesn't get checked, you think it is in eco speed mode, but it is actually half a knot higher than you planned? With FuelOpt you can be sure whatever you set onboard is followed across the whole journey."

The company claims that up to15 per cent fuel savings are possible from this system. As an example it could save 225 tonnes of fuel a year for a 200,000 dwt bulk carrier, with 11MW propulsion power and a fixed pitch propeller, with 25 per cent of its sailing time in harsh weather conditions.

The system is designed to be simple to use, on the basis that it is unlikely to be used if it is too complicated.

Installation can be done during a port stay, no dry docking is required, just some cable pulling.

As a minimum, the system needs to connect to a fuel flowmeter, so it can see the amount of fuel actually flowing to the engine. It also needs to connect to a shaft torque meter, which measures the amount of torque (force causing rotation around an axis) which the engine is creating. You can use flowmeters and torque meters from any supplier.

It cannot be operated from outside the vessel, so does not provide any hole for a hacker to exploit.

The system has been sold on 175 vessels including tankers. Tanker clients include Stenersen, Team Tankers (which acquired Laurin Maritime in 2018), Utkilen, Ektank, Älvtank, Veritas Tankers, and Wisby Tankers.

The system has been installed on vessels with power of 3MW to 42MW, from small cruise vessels of 650 DWT to bulk carriers up to 200,000 DWT.

Controlling propeller pitch

If a vessel has a controllable pitch propeller, the device can automatically adjust the propeller pitch, to achieve the desired speed while allowing the vessel to rotate at its optimum RPM (revolutions per minute). Each engine is designed to operate at a certain RPM and is most efficient at that speed.

By adjusting the propeller pitch, you can adjust the thrust up or down, and the fuel consumption accordingly, while having the same RPM.

The system algorithms decide what adjustment is needed based on the input trends and automatically executes the optimal settings.

Many ships with controllable pitch propellers have a "combinatory curve" onboard with a pre-set safety margin to the engine load limit, which show what power output you are getting from the engine at a certain RPM rotation and a certain propeller pitch.

If you have a "combinator" device, you can apply the values on this static curve. But FuelOpt acts as a dynamic combinator, adapting in real-time to the sea and vessel conditions to get the maximum efficiency possible taking into account instantly engine load limit.

On a chemical / product carrier carrying 50,000 dwt, 11MW engine, with a controllable pitch propeller, sailing from the Pacific to Atlantic, spending 25 per cent of time in unfavourable conditions, Lean Marine estimates the system can achieve 3 tonnes per day fuel savings, which makes 600 tonnes per year.

Fleet Analytics

Lean Marine also offers a performance management software called Fleet Analytics, for analysing performance data.

The software is cloud hosted, and receives data from FuelOpt. This enables fleet operations staff to see performance data for the whole fleet or individual vessels.

A 12-month subscription to Fleet Analytics is included with every new purchase of FuelOpt. TO

Perspectives from Lean Marine's CEO

Mikael Laurin, CEO of Lean Marine, was formerly a customer, as CEO of Laurin Maritime from 2004 to 2018, a company which managed a fleet of sixteen 45-50,000 dwt IMO II / III chemical class ships. He is currently a board member of Team Tankers International. Here he explains why he likes the technology

By Mikael Laurin, CEO, Lean Marine

There are many green technologies available to ship owners. It is not an easy task to know which to invest in and which will deliver tangible fuel savings with a short ROI.

You don't want to take a large capital expense for something that doesn't deliver instant quantifiable benefits to your ship's daily costs or operational efficiency.

But I have seen countless examples of significant wastage of energy on otherwise well-run vessels over the years. Perhaps, your vessel is one of them?

I believe preserving energy gives multiple benefits, including reducing emissions, lowering costs, postponing maintenance and strengthening corporate image.

One technology that I was lucky to encounter during my days at Laurin Maritime was FuelOpt, a propulsion optimization system.

My initial take on the technology was that of a sceptical ship-owner that questioned if the product really works and if so, why this isn't done already or by someone else.

But the estimated saving levels were encouraging and eventually Laurin Maritime became one of Lean Marine's first customers in 2014.

We initially installed it on six vessels, and some time thereafter implemented FuelOpt on the full fleet of medium range oil and chemical tankers. Installation was completed in few days, with no off-hire time required. We were very happy with the fuel saved and operational efficiencies gained resulting from fuel efficiencies.

Direct fuel savings of up to 15% can be achieved with FuelOpt, depending on the type of propulsion, trade and existing system settings for the vessel.

My personal experience shows well over 8% percent annual direct savings on vessels with controllable pitch propellers and additional operational savings and efficiencies on top of that.

One of our customers has a 14 000-ton product/chemical tanker with an average consumption of 15.6 tons per 24 hours. For this ship FuelOpt achieved more than 600 tons of annual fuel savings, which translated into well over $300 000 of cost savings or more than 2 million kgs of CO2 emissions saved.

At Lean Marine, we believe that advanced technologies will play a big role in the shipping industry. We provide automating fuel savings through advanced algorithms but make sure to hide the complexity behind user-friendly interfaces.

TO

The first liquid hydrogen tanker

The hull of the world's first liquid hydrogen tanker was christened Suiso Frontier in Japan in December 2019, to be used as part of a pilot project to carry hydrogen between Australia and Japan.

The ship is not yet floating – delivery and installation of the hydrogen tank is planned for Autumn 2020.

The ship is operated by the Hydrogen Energy Supply-chain Technology Research Association (HySTRA), a consortium of several companies and organisations founded four years ago under the leadership of Kawasaki Heavy Industries.

It will carry "blue" hydrogen (made from methane with carbon capture in place) produced and liquified in Australia.

The vessel's capacity will be 1250m3, compared to up to 267,000m3 for an LNG vessel.

The hydrogen is carried at -250 degrees C.

Japan is keen to develop usage of other fuels to reduce dependence on oil and gas.

The vessel is fitted with a Gas Combustion Unit and burner made by Saacke Marine Systems of Bremen, Germany.

This is used to safely combust boil off gas, hydrogen which gasifies due to imperfect insulation.

Testing and acceptance of the equipment in northern Germany was done in October 2019.

The hydrogen needs to be burned rather than released to the atmosphere, because it may contain methane, which is a dangerous greenhouse gas.

Saacke developed a system which allows the hydrogen to be combusted at pressure of just 0.15 bar, no compression is needed. This system, known as "freeflow", was adopted due to concerns that a compression system could fail, or there could be a dangerous build up of hydrogen in a holding tank.

"This advantage was the deciding factor for the HySTRA customer order, because this SAACKE 100 % free-flow solution is technologically unrivalled, especially for large capacity ranges," Saacke says.

The whole project seeks to prove that transporting liquid hydrogen is as safe as liquid LNG.

TO

Houlder - challenges of tanker ballast installations

Installing ballast water systems on tankers is proving surprisingly tricky. We spoke to maritime engineering firm Houlder about their experiences

Installing ballast water systems on tankers is proving quite a tricky job, involving careful surveys of the deck, perhaps using laser scanners, and consideration of whether the seawater a tanker will encounter during its lifetime is suitable for the ballast water system chosen.

"There are big sums of money involved that give them no return," says Ben Myers, project director with maritime engineering company Houlder.

One challenge installing ballast water systems is scheduling the 3D laser scanning, which is done in order to better understand where the new equipment might be fitted.

Laser scanning builds up a 3D computer image of the existing structure, which can be used as a basis for 3D digital design of the new installation.

Doing laser scanning onboard a tanker requires a "hot work permit". Terminals are reluctant to give permission for scanning when the vessel is at their facilities.

Ben Myers, project director with maritime engineering company Houlder

There are explosion proof laser scanners, but "their significant size and weight makes them almost impossible to use in the marine environment," says Nikolaos Kaloumenos, Senior Marine Engineer at Houlder Limited.

A convenient time to do the scanning is when the vessel has discharged its cargo and is gas free, with engineers sailing on board the vessel. But this all means extra time – since engineers need to stay onboard until they are able to disembark.

The scanning is focussed on areas where the system is intended to be installed, and where the client would like the system to be placed.

It is helpful if the rough location can be agreed by the shipping company and vessel personnel before the scanning starts, Mr Kaloumenos says.

You may need a seawater tank

If an electro chlorination treatment method is used, and the vessel may be sailing in a fresh water environment, then one of the existing tanks will need to be modified to become a seawater storage tank to feed the treatment plant.

This is because the chlorination is made using sodium hypochlorite, generated from the sodium chloride (salt) in sea water. If the ballast water is fresh water, there is no salt present, so a separate supply of seawater is needed.

As a "rule of thumb" this tank should be sized at 1 per cent of the amount of ballast water to be treated, so for example if it is treating 50,000m3 of ballast water, the tank capacity should be 500 m3, Mr Kaloumenos says.

If the water has less than usual saline levels, but contains some salt, you may be able to manage without a tank of salt water, but your system will use much more power.

The fresh water issue could be relevant for tanker operators considering EC systems who nearly always operate in salt water, but do not want to have any constraints in future on where the vessel can trade.

Equipment selection

Making the best choice of equipment is very important. The main choice is between UV and EC systems, and also which supplier you use.

The approach to installation on UV and EC systems is "completely different", Mr Myers says – particularly because UV needs to be Ex proof).

With EC systems, the system generates hydrogen, as well as the chlorine, which kills the microbes.

In general UV has a greater power consumption, but it depends on how it is operated on the vessel and the capacity.

"Usually – there is a rule of thumb that under 1500 cubic metres per hour, UV is a better choice than EC. Anything on a higher scale, EC would probably be better," says Mr Kaloumenos.

Many UV manufacturers have tried to make their systems work for larger and larger water volumes, which means a greater power generation capability is required.

"When you start getting bigger than that you get quite a lot of challenges," he says. "You get a crossover of systems – what's good and what's not."

Houlder has installed a number of UV systems for cruise ships, which are usually smaller capacity than those needed for tankers. EC systems are typically used where there is more water to handle, he says.

You need to consider how much power generation capacity your vessel has and whether that will be enough for what your ballast system will need. But also consider that you will normally be operating the ballast system at times when other services on the vessel are not being used – so there is power generation capacity available.

Some equipment on the market does not yet

Nikolaos Kaloumenos, Senior Marine Engineer at Houlder Limited

meet the regulations for any new equipment installed after October 2020. But some companies are offering guarantees that they will be approved in time, Mr Myers says.

"People say, 'buy our system, we'll pay any costs incurred.' They've obviously done a lot of homework. I think the client is still in a good place to push that risk onto equipment suppliers. They have invested a lot of time and money over the years."

Doing it carefully

Mr Myers emphasises the importance of doing the task carefully, with proper engineering work.

Many tanker companies are not carefully considering their options with ballast water, just doing whatever their competitors did, he says.

"There's a lot of choice in the market, a lot of hearsay, what you can't beat is good hard engineering facts. The engineering doesn't lie if you do it correctly."

"Ballast water has quite a few intricacies, lots of details to get right, which can trip you up. Each vessel is configured differently, spare power, how they operate the vessel."

"A well planned installation is better than something rushed."

About Houlder

Houlder is an independent organisation, able to provide "well informed advice" to shipping companies about how to install systems – while shipyards may be inclined to sell whatever they get the best commission on," Mr Myers says.

It can pay off to "get an independent designer involved early on," Mr Myers says. "The manufacturer will say yes until they can't do it. We can do independent feasibility studies early on."

Sometimes equipment contractors will themselves contract an engineering house to work out how the system should be installed on vessels. But that means you cannot use the expertise of the engineering house to work out which equipment is most suitable.

"You don't get the 360 degree view of what your options are," he says.

The company offers design, technical consultancy, analysis and supervision services, with building, modifying and maintaining ships – including work on diving and offshore support vessels, cable layers, Ro-Ro and Ro-Pax ferries, specialist use vessels and super and mega yachts.

Houlder did a number of projects with tanker operators related to scrubbers, and this has led to projects with ballast water systems.

On the ballast water side, it has done a number of projects in the cruise and ferry sector, which have been installing ballast water systems earlier than tanker companies. But now it is getting more and more enquiries in commercial shipping, particularly tankers.

Houlder's services range from doing a simple concept feasibility study to a full "turnkey" package including design and installation.

Or it can do all the engineering work up to the design stage, where the shipping company knows exactly what to ask a shipyard to install. Houlder can then support the installation and commissioning work with people onsite at the shipyard.

It has also done troubleshooting projects, done by someone else which have gone wrong.

TO

Navios Maritime Acquisition Corporation

A Vertically Integrated Global Shipping Company

www.navios-acquisition.com