

Total Cost of Operation

A guide to optimising vessel operating costs

Crew | Maintenance
Insurance & Compliance

Repairs | Coatings
Travel | Fuels & Lubes

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The smart money is on finding value



Richard Meade
Editor

The shipping industry is on the verge of a paradigm shift. Rapidly evolving technologies are challenging traditional operating models, the regulatory landscape is shifting and the global economy that shipping serves is going through a period of transformative change.

Put simply, the business of shipping is more complex and costly than it ever has been.

The most successful companies are adapting to find ways of using data that informs shrewder decision making. Efficiency is the goal, but the smart money is on finding value beyond cost savings.

We expect to see a revolution in how the industry operates assets over the next few years and much of this will be driven by the way we use data.

Smart performance management systems are evolving. The next generation of ships will be super-connected assets, where systems are monitored in real time and predictive analytics allows companies to forecast spend, react to changes ahead of time and plan strategically for likely scenarios.

With greater data-led insights and more sophisticated tools, the traditional role of procurement in marine businesses is evolving. Suppliers are rapidly becoming partners in a process that helps businesses improve quality control, transform reliability, improve productivity and cut costs.

Understanding the complexities of compliance costs, reacting to rapidly changing regulatory requirements and managing legal risk is increasingly a process of collaboration with trusted expert partners rather than a traditional in-house affair.

The acid test for any smart shipping investment is whether it can deliver lower unit costs, or add value by providing better service for the same price. But for companies to effectively address the issues of efficiency, safety and personnel management which they face today, cost is secondary to value and sustainability.

We hope you find this guide a useful partner.

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Business intelligence | informa

Our editorial mission is to provide information, analysis and knowledge for business decision makers in the shipping community. We deliver subscribers business-critical information in the distribution channels most suited to the needs.

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Cut costs cautiously, strengthen supplier links

The one certainty about vessel operating costs is that they fluctuate, and will continue to do so, in line with the fortunes of shipping.

“Any sort of improvement in the shipping markets would more likely than not be accompanied by an increase in operating costs,” said Richard Greiner, Moore Stephens partner, Shipping & Transport, whose accountancy and advisory group produces the authoritative, annual Future Operating Costs Survey (OpCost) on the state of vessel operating costs.

Greiner, backed by 30 years’ experience providing assurance and advisory services to shipping and offshore, said any increase in operating costs “would have to be weighed in the balance against savings achieved as a result of the continuing influx of modern, more efficient vessels and of improved technology generally.”

The temptation in difficult times is to cut back on any but the most urgent expenditure. This may be a false economy

“The temptation in difficult times is to cut back on any but the most urgent expenditure. This may be a false economy, but it does explain to some extent the significant fall in the levels of expenditure on the likes of repairs and maintenance in recent years,” Greiner told Lloyd’s List.

Similarly, in times of improved profitability, operating expenditure

is likely to increase. But if operating costs do prove to have risen in 2018 by the 2.4% predicted in last year’s OpCost, they will still be less than one-sixth of the almost 15% in actual operating costs absorbed by the industry in 2008.

Although it is unlikely that shipping will return any time soon to its freewheeling pre-2008 days, there are reasons to believe that the start of a meaningful recovery may be under way.

“We can expect crew costs to go up. The likes of BIMCO (Baltic and International Maritime Council) and the ICS (International Chamber of Shipping) have predicted a serious shortfall in officers over the coming years. That will only add to the pressure on costs as the world fleet continues to grow. Investment in crew costs should be well-researched, in line with every other item of expenditure, and must form part of the overall business plan,” Greiner said.

“We can expect oil prices to continue their recent recovery and thus we can expect the cost of marine fuels to increase. And we can expect the demand for investment in technology to rise, in concert with the need to comply with regulation, which may involve the need to invest in scrubber technology and other initiatives.

“It seems inevitable that the cost of compliance with regulatory requirements will form a growing part of overall TCO.

“All of this will serve to push up operating costs, but technological advances have already started to make shipping more efficient and, importantly, more cost-efficient, and there are doubtless more significant operating efficiencies to come.

“It’s something of a balancing act. The



We can expect the demand for investment in technology to rise, in concert with the need to comply with regulation

Richard Greiner

Moore Stephens Partner

Shipping & Transport

challenge for the shipping industry is to work towards a market where freight rates pay for operating cost increases and leave enough over for ongoing investment in well-researched projects backed by affordable finance. That would doubtless please even Benjamin Franklin, who long ago warned us that, ‘Creditors have better memories than debtors’.”

While rising costs may be a fact of life for many, business relationships can be a route to a successful total cost of operation strategy, according to Mark Cameron, Executive Vice President and COO of Ardmore Shipping.

Ardmore, based in Cork and with offices in Hong Kong, Houston and Singapore, owns and operates a fleet of 28 product and chemical tankers globally.

“A (TCO) challenge is the granularity of how cost is often measured, which results in a risk-averse attitude to spending. This stands in the way of greater commercial opportunity, and yet potential savings pale in significance next to overall spends, because in many instances, we’ve already reduced expenditure to practical lows. It’s becoming less and less about cost and more and more about interpersonal skills,” he said.

Cameron cited main engines as an example: “Increasingly, ‘testing’ is done on in-service vessels. If something goes wrong, two things are needed — respectful relationships with key partners and tightly written contractual arrangements.

Honesty and respect in relationships extends to an area which Cameron cited as of most importance in TCO terms: crew, and crew quality.

“Compliance means that we have to work hard to address and get rid of the ‘blame culture’. Put simply, we have to comply with regulations, so we need crew members to be telling us what we need to know in terms of how ships’ systems are performing. This is especially important as the numbers of systems suppliers decrease.”

Reward needn’t be purely financial, he said. For example, travel for the top-performing crew members could be Business Class rather than Economy — fostering contentment without an ever-spiraling wage bill.

Cameron said making partnerships work is important. “For lubes, that means contract rather than spot supply, a point that was reinforced in the early 2000s when a base oil shortage led to scarcities; you may need to give a little, in order to get, but the alternative is blowing your budgets, particularly when you are spot trading”.



It’s becoming less and less about cost and more and more about interpersonal skills

Mark Cameron

EVP and COO

Ardmore Shipping

In its 2017 **Future Operating Costs Survey**, Moore Stephens concluded that ship operating costs could be expected to have risen by 2.4% in 2018. The cost of repairs & maintenance was predicted to increase by 2.0% in the same full year, while expenditure on spares would rise by 1.9%. Dry-docking expenditure, meanwhile, was expected to increase by 1.8%.

The outlay on crew wages was expected to increase by 1.7%, while other crew costs were thought likely to go up by 1.5%. The increase in expenditure for lubricants was anticipated to be 1.6%; the projected increases in stores 1.7% and management fees were expected to rise by around 1.0%.

OpCost 2018 will be published in Autumn this year.

Skimp on crew costs at your peril

While crew costs figure heavily in the overall bill for operating a vessel, owners are urged to focus on the quality of their people, rather than just the bottom line.

A focus on the quality of crew appears to be finding more favour with owners, operators and managers, if not all, according to Wallem Ship Management.

The Hong Kong-headquartered ship management group, founded in Shanghai in 1903 by Norwegian shipbroker Haakon Wallem, said quality should be the overriding factor in crew's place within the TCO matrix.

Wallem's Marine Director, Fared Khan, told Lloyd's List that to maintain that quality, training has to evolve to reflect modern realities, with a greater emphasis on universal standards, and greater consideration given to crew wellness.

"Crew quality is an issue which always comes up, and the economic outlook within the shipping sector has had an effect in recent years. There's a general feeling in the industry that the quality of training imparted at the various training centres approved to conduct mandatory STCW (Standards of Training, Certification & Watchkeeping) courses is a concern. This means that shipowners are being left to pick up the slack in their own training centres," he said.

The STCW Convention was adopted by the IMO in 1978 to set minimum qualification standards for masters, officers and watch personnel on seagoing merchant ships and large yachts.

"The bodies that conduct the training are also a factor. In the past, national governments of maritime nations prioritised maritime education and training, so we saw very high-quality individuals coming out of these training centres. Around a decade ago, however, we saw a shift to the private sector. Financial realities mean that budgets have been reduced and the quality has suffered," said Khan.

The increasing complexities and technology on new generation vessels only serve to

underline the need for highly-skilled crew who, owners acknowledge, are being asked, at times, to perform tasks in line with onerous demands.

That was touched upon in the most recent annual Moore Stephens OpCost report based on a survey of actual running costs of some 3,200 vessels. As one survey respondent put it: "Crew costs are 60% of our operating expenditure, and weigh heavily when there is high demand for, but a limited supply of, manpower and when employers are required to meet increasingly onerous requirements."

Another respondent said: "Most shipping companies, but especially those operating tankers and chemical and gas carries, are facing the prospect of increases in costs.... for hiring qualified crew."



Shipowners, operators and managers would be unwise to skimp on costs when intelligent vessels will depend on highly-skilled crews

Richard Clayton

Lloyd's List Chief Correspondent

Much of the industry-wide predictions in recent years of unmanned vessels has given way to a more pragmatic and prevailing view that crew will continue to be an essential element of any TCO planning.

"It was once thought that the digital disruption beginning to transform shipping would remove the need for seafarers altogether," said Lloyd's List Chief Correspondent Richard Clayton.

"Remotely-controlled vessels would arrive at remotely-connected terminals, and transfer their cargoes onto driverless



One of the methods to enhance crew wellness and satisfaction is to institute onboard mentoring which fosters employee loyalty and leads to reduced recruitment costs.

trucks, rail wagons, and inland barges. This futuristic scenario proved far from convincing for current seafarers and for maritime experts with experience of how unpredictable the sea is.

“However, while unmanned shipping is unlikely in the near future, the connected ship is expected to operate with fewer seafarers than today. Those seafarers will be trained to work alongside the shore teams in the role of technicians, navigating with upgraded aids, maintaining propulsion and connected systems. Shipowners, operators, and managers would be unwise to skimp on costs when intelligent vessels will depend on highly-skilled crews,” Clayton said.

Khan said there is room to learn from the aviation industry, where failure to qualify in the simulator test leads to suspension of permission to fly. The hidden costs of inadequate training or inattention to crew wellness are mental disorders and accidents.

“Wellness,” said Khan, “is influenced by factors such as ISPS (International Ship & Port Facility Security) regulations, which means that ships’ crews cannot go ashore when in port. This can lead to individuals spending extended periods, often many months, effectively at sea,

and mental health and suicide are increasing concerns.”

Owners and operators are learning that maintaining wellness, which embraces a seafarer’s onboard satisfaction during down time, involves adequate expenditure on communications technology.

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According to the latest Crew Connectivity study, conducted by London-based Futureonautics, the spread of access to the internet while out at sea has been rapid over the past two years because, among other reasons, younger seafarers regard connectivity as a *sine qua non*.

The wellness factor impacts a range of employer costs beyond communications expenditure, according to Lloyd’s List’s Richard Clayton: “Few millennials find seafaring their dream career, if they think about seafaring at all. Seafarers want to be paid on time, they want healthcare benefits for their family, they want training and career development, and decent food. Internet access is a given, like safe working conditions. Without these, seafarers will look elsewhere.”



If the seafarer has had very little, poor or no sleep because they have been stuck on a flight in Economy, then he or she reports for duty exhausted. Operational safety becomes an issue.

Getting ahead of the crew travel curve

Contracted travel is on the increase as owners and operators seek efficiencies.

Crew travel, for the shipping sector, is big business. Tackling the complex and often widely differing needs of 1.5 million seafarers from around 150 countries is a huge logistical undertaking, with the attendant cost burden.

Creating a positive environment for seafarers means that contingency planning is a must. Good shipping companies should have a robust travel policy, effectively implemented to ensure safety, security, health, comfort and – where possible – cost efficiency.

The trend, given the state of the worldwide economy, is to look

at how to make travel more efficient and, somehow, more economical. However, Wallem Ship Management's Fared Khan said operators risk losing sight of duty of care if they attempt to cut costs too far.

"The seafarer's typical journey from home to deck to home again is usually made up of a significant number of individual stages. At the outbound stage, a cab to the airport can be followed by a flight, a transit of some kind to a port, a step onto a launch, and then onto the ship. The whole process is reversed at the end of a contract.

"Attempts to save money

can have a serious effect on individuals' safety and comfort, ultimately having a negative effect on morale, performance and fatigue. A prime concern is that work/rest hours always focuses on the time onboard, not on travel, but simply to get to work, a seafarer may have undertaken a long journey across several time zones. If the seafarer has had very little, poor or no sleep because they have been stuck on a flight in Economy, then he or she arrives and reports for duty exhausted. Operational safety becomes an issue.

"In more prosperous times, seafarers travelled, stayed in

hotels along the way and arrived onboard well rested. The current economic outlook means that people aren't looking at travel from the right perspective. We need to look at it more holistically, with a view to security and wellness. How many shipping companies, for instance, undertake risk assessments relating to crew travel? And this should not just encompass how people travel but, should cover areas of conflict, civil unrest, terrorism and natural disasters such as earthquakes or tsunamis.

"If an individual starts a trip with a demoralised mindset, this will have an immediate effect on efficiency and commitment," said Khan.

Shipping is slow at embracing technology, but with smart phone technology, seafarers should all be reachable at a push of the button — especially in a crisis. Family members also need strong assurances from the employer or travel company that the seafarer is safe and will be well taken care of.

There are a number of positive initiatives being offered by some of the bigger and reputable travel providers for crew transport which are reaping savings for operators and repeat business for the providers.

"Knowledge, flexibility and global 24/7 coverage are essentials, and many shipping companies are going for contracted travel services as a result," said Khan.

"They organise very effective door-to-door monitoring of individuals' journeys. They also plan further ahead, given that booking a week or even a few days ahead of travel can realise appreciable cost savings than

booking just the day before. And, from the individual crew member's perspective, he or she gets an itinerary several days before entering port. That gives everyone involved greater peace of mind."

Shipping executives as an industry would ultimately save themselves money if they would become more open and forthcoming and help make best practice become universal.

"Shipping is a very traditional industry and many people and organisations continue to be very secretive or self-centred in an



Booking a week or even a few days ahead of travel can realise appreciable cost savings

Fared Khan,
Marine Director
Wallem Ship Management

effort to maintain a perceived competitive advantage," said Khan. "For example, sharing best practice on remote ports' logistic arrangements involving visas, immigration, agents, land and coastal transport will create a win-win scenario for all stakeholders.

"What we really need to do is get industry leaders together, with the aim of making seafarers' travel less stressful, managing fatigue, allowing for operational safety, security, health and wellness. If we're going to achieve best practice, we need a fully collaborative industry approach," Khan concluded.

1.5M
estimated number
of seafarers
employed on
vessels worldwide



Fuel and lubricant procurement choices critical pre-2020

The maritime industry continues to experience downward pressure on profits, with changing emission regulations adding further complexity

The International Maritime Organization's (IMO) 0.50 per cent global sulphur cap – effective 1 January 2020 – is already significantly impacting the industry, reshaping the fuels landscape and changing lubricant requirements.

This regulatory amendment will see fuel suppliers develop new formulations and force vessel operators to reconsider their marine fuel choices. Vessel operators must also ensure they select lubricants that not only deliver maximum protection for efficient engine operations but also minimise maintenance and costly downtime.

These changes can have far-reaching financial impacts, so procurement professionals must fully understand the ramifications of their fuel selections and how to curtail the potential cost risks. Crucially, they must ensure alignment of internal KPIs from both a financial and technical perspective and understand how fuel choices ahead of 2020 may affect these.

Reaching financial KPIs during regulatory change is both fundamental for business success and daunting for procurement professionals. Suppliers have years of sector experience and understand the challenges that vessel operators face – from technical engineering questions to financial implications of fuel or lubricant choices. Vessel operators should therefore seek to form partnerships versus transactional relationships with suppliers. Their technical insights and in-depth advice can prove invaluable in helping vessel operators make the

best possible purchasing decisions.

The fuel landscape continues to evolve, creating various routes to compliance. Each fuel option needs careful consideration and the most effective option will be based on an evaluation made for each vessel type, route, age, engine and cost.

Compliance options include:

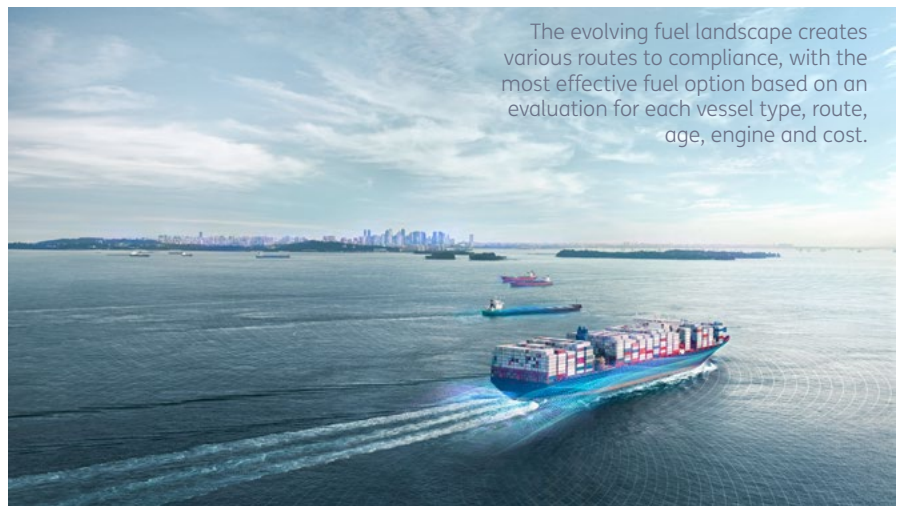
- Low sulphur distillates, such as marine gas oil (MGO)
- New low sulphur fuels
- Low sulphur fuel blends
- Premium Emission Control Area (ECA) blends
- Liquefied natural gas (LNG)
- The continued use of high sulphur fuel oil (HSFO) in conjunction with a scrubber

ExxonMobil anticipates most vessel operators (an estimated 95 per cent) will choose a compliant, low-sulphur fuel.

If a low sulphur fuel is the chosen route, vessel operators will almost certainly encounter challenges when they make the change. Fuel quality issues include problems with stability and cat fines. As operators bunker new streams from different sources with so

many different formulations, compatibility problems will likely become far more prevalent than experienced today. These issues can ultimately result in the need for costly remedial work. With an increasing number and variety of fuels, it is now more important than ever for vessel operators to be diligent in compatibility testing, handling and storage practices.

Vessel operators are not solely responsible for managing compatibility; fuel suppliers also have responsibility at the start to avoid issues. ExxonMobil uses proprietary technology to help mitigate compatibility risks in our fuels as far as possible, but the broad range of new streams from the 600+ refineries around the world may make compatibility issues unavoidable at times. It is therefore essential that procurement personnel always work with a fuel supplier with a proven track record of understanding marine industry problems and bunker fuels that meet the latest ISO 8217:2017 specification. The cost of quality fuels is a small price to pay



The evolving fuel landscape creates various routes to compliance, with the most effective fuel option based on an evaluation for each vessel type, route, age, engine and cost.

compared to the financial damage incurred following a major compatibility problem.

Low sulphur fuels are not the only route to compliance ahead of 2020. Fitting a scrubber to a vessel and continuing to burn HSFO is another option and return on investment (ROI) is a key consideration. Operators must ultimately consider if bunkering a cheaper fuel will cover the cost of this investment over the life of the vessel. It is also vital that operators guarantee supply of HSFO. With the market predominantly choosing to bunker 0.50 per cent sulphur fuels, logistics dedicated to HSFO will become scarcer.

At ExxonMobil, we advise operators agree to a contract with a reputable supplier that guarantees fuel supply for a fixed period. Bunkering HSFO without prior planning and agreement may not be possible at many ports around the world. In short, to maximise ROI on an investment in a scrubber, a contractual agreement for HSFO is essential.

Changing emissions regulations are not only affecting fuel selection for most operators but are also creating engine oil challenges. Selecting the right lubricants to cope with the changing fuel mix and evolving engine designs is crucial for maintaining efficient engine operations, minimising costly maintenance-related issues and optimising lubricant usage.

To ensure correct engine oil selection, procurement staff should work closely with their engineers to align technical requirements with any financial concerns, and with their suppliers to identify the engine oil that works best with a vessel's fuel selection. This will help ensure:

- Enhanced protection of engine components
- Reduced unscheduled maintenance
- Optimised lubricant consumption

ExxonMobil has products available



Vessel operators should work with suppliers that have the expertise to help them efficiently migrate to a low sulphur future.

Iain White

Global Field Engineering Manager

ExxonMobil

at more than 600 ports around the world, including Singapore, Rotterdam and Hamburg. All main ports will have the full range of engine oils required ahead of the 2020 implementation of the IMO regulation.

According to marine mutual insurer, The Swedish Club, the single largest cause of main engine damage is lubricant failure¹. The organisation looked at more than 200 claims for the period of 2015 to 2017 and found that those related to lubrication error cost an average of \$763,320 to repair.

Based on this high cost, The Swedish Club recommends that vessel operators implement robust on-board systems, including regular scrape down oil analysis, which has a proven track record of helping identify engine issues before they escalate.

At ExxonMobil, our recently launched Mobil ServSM Cylinder Condition Monitoring service is taking scrape down oil analysis to the next level. By harnessing the latest in big data analysis, the service delivers actionable insights to operators within moments of testing. On-board engineers can rapidly react to the findings, taking steps to help reduce costly component damage and downtime, optimising lubricant usage in the process.

Analysis of historic scrape-down oil data provides comprehensive insights into the performance of engines in a wide range of operating conditions, plotting trends and detecting issues before they cause trouble. Mobil Serv Cylinder Condition Monitoring can

identify early signs of wear, cat fine damage, cold corrosion and under- and over-lubrication. Operators receive immediate actionable insights, enabling them to quickly address crucial issues before they become problems. Optimising lubricant levels will lead to efficient engine operation and can reduce lubricant expenditure. Ultimately, failing to address issues could lead to a significant and costly engine failure, so the value the service can provide should not be underestimated.

The maritime industry is a changing environment with tough economic conditions, and complexities arising from emission regulations continue to add to the challenge.

More than ever, ensuring a collaborative approach across the business, from engineer to procurement, is crucial for any vessel operator. Aligning on the investment in quality fuels and cylinder oils and realising the value of scrape-down oil analysis services can help protect the bottom line. Procurement professionals can realise the greatest savings that benefit the business in the long-term by taking this collaborative approach into partnering with suppliers, too. Working with a fuel and lubricant supplier that has a track record of delivering fully-integrated marine industry solutions can provide the platform to meet today's challenges together and succeed.

¹ The Swedish Club, "Main Engine Damage" Report, 2018, https://www.swedishclub.com/media_upload/files/Loss%20Prevention/Main%20Engine%20Damage%202018/TSC-main-engine-web%202018%20%281%29.pdf

A coat for all reasons

More shipowners are looking to suppliers to manage their coatings solutions, sometimes for a fixed cost, to bring quality and continuity to their TCO.

All shipowners and seafarers are aware of the importance of coatings in maintaining ships that are efficient, safe and profitable, even if not every owner uses that knowledge to the best effect.

Above or below the waterline, coatings are the first line of defence against two of a ship's biggest threats – corrosion and fouling. Protecting against corrosion not only prevents the vessel structure from deteriorating, but also allows the ship to present a good image. That can be an important factor in avoiding a Port State Control (PSC) inspection or gaining additional employment from a charterer.

Below the waterline, fouling by weed, barnacles and other organisms significantly slows a ship's speed and adds to the fuel used which both increases operating costs and exhaust emissions. Papers submitted to the IMO when it was formulating the EEDI (Energy Efficiency Design Index) rules suggest that the reduction in efficiency can vary from around 5%-20%. For this reason, coatings are mentioned frequently in the EEDI and SEEMP (Ship Energy Efficiency Management Plan) rules and guidelines as a major contributor to improved performance.

Fouling takes place when marine plants and organisms can attach themselves to the hull and form colonies. How rapidly this takes place depends upon several factors. These include the area in which the vessel is operating, the speed at which the vessel normally operates, the length of any idle periods such as port stays

or anchoring and the type and quality of the coating that has been applied. Preventing fouling can be done in a variety of ways and there are specialist products developed by coatings makers to suit a wide variety of vessel types and operating parameters.

The technologies involved include anti-fouling which contain a biocide to kill any organism that attaches, and foul-release which works either by way of a very hard smooth coating that offers no purchase for organisms, or by way of an active ingredient such as medetomidine that chemically repels organisms. Competition between suppliers is fierce and in the past, many performance claims were made that could not be substantiated.

For this reason, Norway-based coatings manufacturer Jotun was a leading instigator in devising a means by which the performance of coatings can be measured. Along with other suppliers, Jotun – with 40 production facilities in 24 countries – has participated in the development of the ISO 19030 standard which was finalised in 2017. It is for individual suppliers to determine what should happen if a coating fails to live up to expectations, but the standard itself does require the owner

to participate in performance monitoring which can involve fitting sensors and making use of software products from third parties.

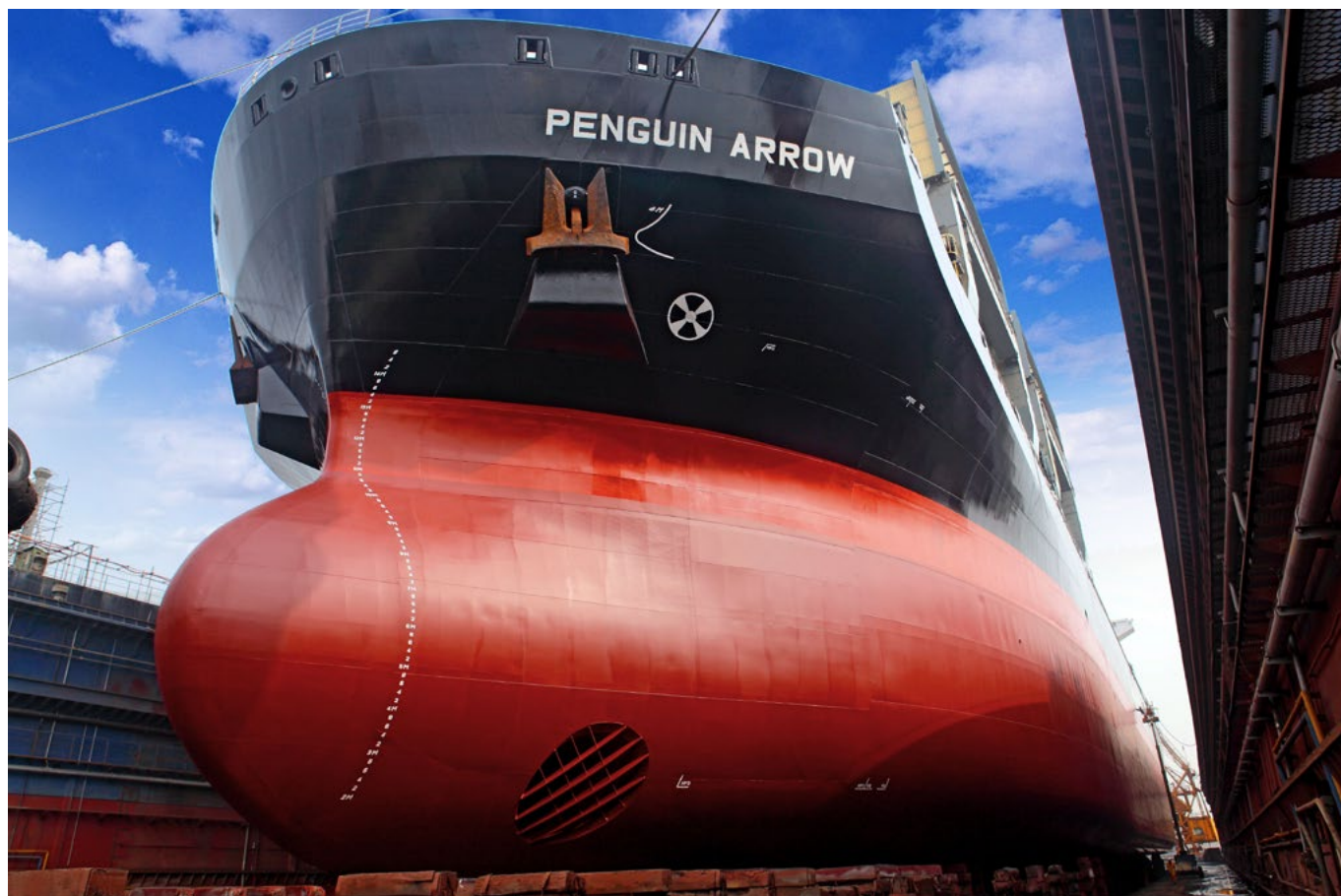
Stein Kjølberg, global concept director of Jotun Hull Performance Solutions, told Lloyd's List: "Performance monitoring is maturing, and there's a lot of interest being shown in the ISO 19030 standard. This is not surprising since poor hull and propeller performance is currently estimated to account for around 10% of the world's fleet energy cost and corresponding greenhouse gas emissions. This points to a considerable improvement potential. Operators can reduce their fuel costs and emissions significantly if they opt to use proven quality coatings and a standardised approach and data-driven solutions".

Adopting performance monitoring will involve an additional expense, but providing it is done in accordance with the agreement between supplier and shipowner, underperformance will likely be compensated for in some way. Usually, that will be by way of refunding the difference between any premium product specified as necessary by the supplier and an



Poor hull and propeller performance is currently estimated to account for around 10% of the world's fleet energy cost and corresponding greenhouse gas emissions

Stein Kjølberg, Global Concept Director
Jotun Hull Performance Solutions



The cargo vessel Penguin Arrow was almost completely free of fouling after 60 months' operation with a premium anti-fouling product

industry standard alternative.

There are also other commercial considerations. If a ship is operating under a time charter agreement, the cost of the fuel falls first on the charterer, but if the ship is not performing as promised because of fouling, then the charterer can put the vessel off-hire and press a non-performance claim against the owner.

“Leading coating suppliers are using the (ISO) standard as a means to measure the performance of their coatings”,

20%

potential efficiency reduction
from below the waterline fouling

said Kjølberg. “We also see that certain projects have started to specify requirements on speed loss according to the standard. Interestingly, vessel charterers are showing a stronger interest in performance monitoring. They see the value in it and in the importance of quality coatings. Increasingly, they are going back to tonnage providers and requesting coating upgrades in contracts,” he added.

Regardless of whether the ISO 19030 performance is being applied or what technology is employed in the coating, getting the most cost-effective performance relies upon the right choice of product for the vessel's normal operating profile. The range of products from the major coating suppliers is extensive and can be daunting for an owner to choose correctly, but it is important for them to research products for the best results possible and that may involve choosing a premium product that

involves a high initial outlay.

Beginning from the newbuilding stage in a ship's life, owners need to match the planned operating profile with available products. To do this, they must take an active role in selecting the coating and not rely on the shipbuilder who will almost always look for the cheapest product that claims to meet the owner's requirements.

Even if an owner takes the trouble to research, it is vital that the exact product specifications are relayed to the builder. Most coatings suppliers have a range of products with similar names; Jotun, for example, has four main ranges of hull coatings, but there are several products within each range, each specified for different uses. Simply specifying SeaQuantum without detailing which, could see the wrong product applied.

What you see is not always what you will get.

Supplier relationships and technology reduce running costs

Ship maintenance technology has developed rapidly and markedly in recent years, but much of the shipping world has yet to fully adopt it.

Classification societies universally recommend condition monitoring technology as best practice in maintenance, but studies conducted by specialist maintenance provider Parker Kittiwake reveal only 10% of the industry has fully embracing regimens that involve condition monitoring.

Parker Kittiwake's Marine Condition Monitoring Manager, Larry Rumbol, said that finding presents an opportunity in the other 90% of the market.

"It means that there's an opportunity to get out there and effect some radical changes to ideals and doctrines — and, indeed, that's borne out by the success that we have had over the last year or so," said Rumbol, whose company services more than a thousand blue chip clients globally.

Condition monitoring, widely offered as a maintenance tool, collects performance data and delivers it to a central point for analysis and remediation. Component-level monitoring can now be augmented by more sophisticated onboard monitoring through sensors which relay data to shore via cloud computing, providing predictive recommendations and reducing repair, maintenance and fuel costs.

Rumbol said the first thing that has to change is how condition monitoring is perceived at the boardroom level.

"It has the image of being about expensive gadgets in cupboards, because that was the reality when many of those who are now in the boardroom were at sea quite some years ago. The reality is very different. Technology has moved on quite significantly. We're

not seeing acceptance of new technology. Instead, we're seeing fear. What we're trying to put across to people in decision-making positions is that it's perhaps rather better to be seen as a hero in the boardroom than a Luddite.

"Around 70% of maritime failures are the result of human interventions. At the same time, it's very easy to over-maintain. We need people to think about how to work smarter. Why, for instance, should you pay for an overhaul you don't need, especially when that overhaul might increase the risk of breakdown?

"There's a lot of technology out there which is simply too complicated for the levels of crew training that we enjoy right now. So, we should simply shelve it. At the same time, there are technologies out there which are simple to use, are effective, and which have very short, but proven, payback periods. I'm talking here about as little as six months," said Rumbol.

15%

the number of owners/operators that rate regulatory compliance as a 'major' cost contingency



We're trying to put across to people in decision-making positions that it's perhaps rather better to be seen as a hero in the boardroom than a Luddite

Larry Rumbol

Marine Condition Monitoring Manager

Parker Kittiwake

Newer technology proves revelatory once demonstrated to those with the buying power

“I spend a lot of time speaking to fleet directors, and quite often it’s those responsible for running smaller fleets who are more keenly aware of cost, he said.

Rumbol cited onboard analysis capability. “It’s an ‘unnecessary’ \$10,000 cost which has to compete with already established essentials. But then look at the cost of replacing a crank on a four-stroke generator. I have quite a number of conversations where I ask how often such an event happens and get weary responses as to how frequent they are.

“That’s a \$400,000 event and I ask fleet directors how much better they’d sleep at night if it were never to happen. The reality is that that crank will have started to fail six weeks before it finally gave up. There’s the ability to have that knowledge ahead of time, and it can be delivered to your desktop, your smart phone — in fact, pretty much wherever you’d like it to go. And the cost of that ‘unnecessary’ piece of equipment is just a tiny percentage of the cost of that failure,” said Rumbol.

At the end of the day, said Duncan Tanner, Senior Manager – Marine Engineering at NASDAQ-listed Exponent International, “the key is for the procurement team to create relationships with ships’ crews, spares suppliers and manufacturers and port agents.”

Modern communications have expedited approvals, ordering, and delivery, but occasional hold-ups still occur when the human element introduces interruptions. Even so, “it’s still a challenge to position spare

parts in a convenient port because so much of shipping operates on a non-linear pattern,” said Tanner. “While it makes sense to keep spares in Singapore for ships that trade in the Asia Pacific region, how does that help your one ship on charter off the coast of Brazil? Having a capable procurement team is part of the solution, together with a robust software system for spares ordering.”

Predictive maintenance gives the procurement team time enough to plan, order, deliver, and hold spares either in port or onboard ship. But what takes time is when things happen that weren’t planned: breakdowns that couldn’t be predicted, boxes of the wrong parts or similar parts with the wrong dimensions, or already-used spares.

“As a superintendent, I preferred a midnight call from a chief engineer who tells me they have a problem, and this is the solution they suggest, to a call asking what the superintendent would do,” said Tanner. “It’s more a concern about engineers’ lack of experience because they may no longer have the time or the training to carry out some of the more complex projects.

“As modern ships carry more technically advanced equipment, ships’ engineers rarely do the major jobs, these being carried out by shore-based specialists. Many of the older ships that need most attention from the procurement team are facing a cliff with IMO sulphur cap being implemented in 2020. If many are scrapped as a result, it may impact the procurement sector,” said Tanner.

Looking ahead, there is much talk about additive manufacturing (3D printing of components), with a 3D printer and material kept onboard ship. This might be an option, although it is more likely that suppliers at a larger port would have a 3D printer and would provide printed spares to order. Such spares would need to conform with present quality standards and approvals.



The key is for the procurement team to create relationships with ships’ crews, spares suppliers and manufacturers and port agents

Duncan Tanner

Senior Manager – Marine Engineering
Exponent International

Regulatory compliance costs on the rise

Regulatory compliance is a growing call on a ship's running costs as agencies, countries and regions impose more restrictions on how shipping must operate.

No TCO plan is complete without contingencies for compliance with an ever growing, complex web of regulations.

The impact of new regulations was included in 2017, for the first time, in Moore Stephens' international OpCost survey of factors which respondents cited as most likely to influence the level of their operating costs over the next 12 months. Fifteen per-cent of respondents to the annual report identified the cost of regulatory compliance as a major consideration when weighing future operating cost increases.

Joe Walsh, a Los Angeles-based Partner at global law firm Clyde & Co, said shipping must start thinking about more than just enforcement by regulators and flag states.

"What we're starting to see, in best practice terms, is shipping companies taking a more proactive role and taking ownership of compliance by setting up internal governance bodies with the power and resources to take control of issues and effect change. Crucially, support for these is coming down from the very top," said Walsh.

Such an approach, he said, is less expensive than having to engage in the types of Environmental Compliance Programmes (ECPs) which have arisen. For example, United States ECPs use a third-party auditor which has the power to board vessels, carry out checks and report back to court officers – all at the shipowner's expense.

There is an increasing need for shipping companies

to consider what is covered or insurable and look first to mitigate those things which may not be, said Walsh.

"In many cases that means human factors rather



Cyber security must be a component of any TCO blueprint

than technical issues. By that I mean defining issues such as misconduct, and crew training and quality. But we also need to look at resourcing, in these financially straitened times. Take crew watch and rest requirements as an example: are STCW (Standards of Training, Certification & Watchkeeping) requirements being met or are ships' masters taking risks under pressure? That's a liability issue that requires an environment of honesty where both crews and owners feel that they can be open with each other."

Walsh said ballast water/anti-fouling, low-sulphur fuels and emissions are areas of most concern in

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No-one wants to be the first through the wringer

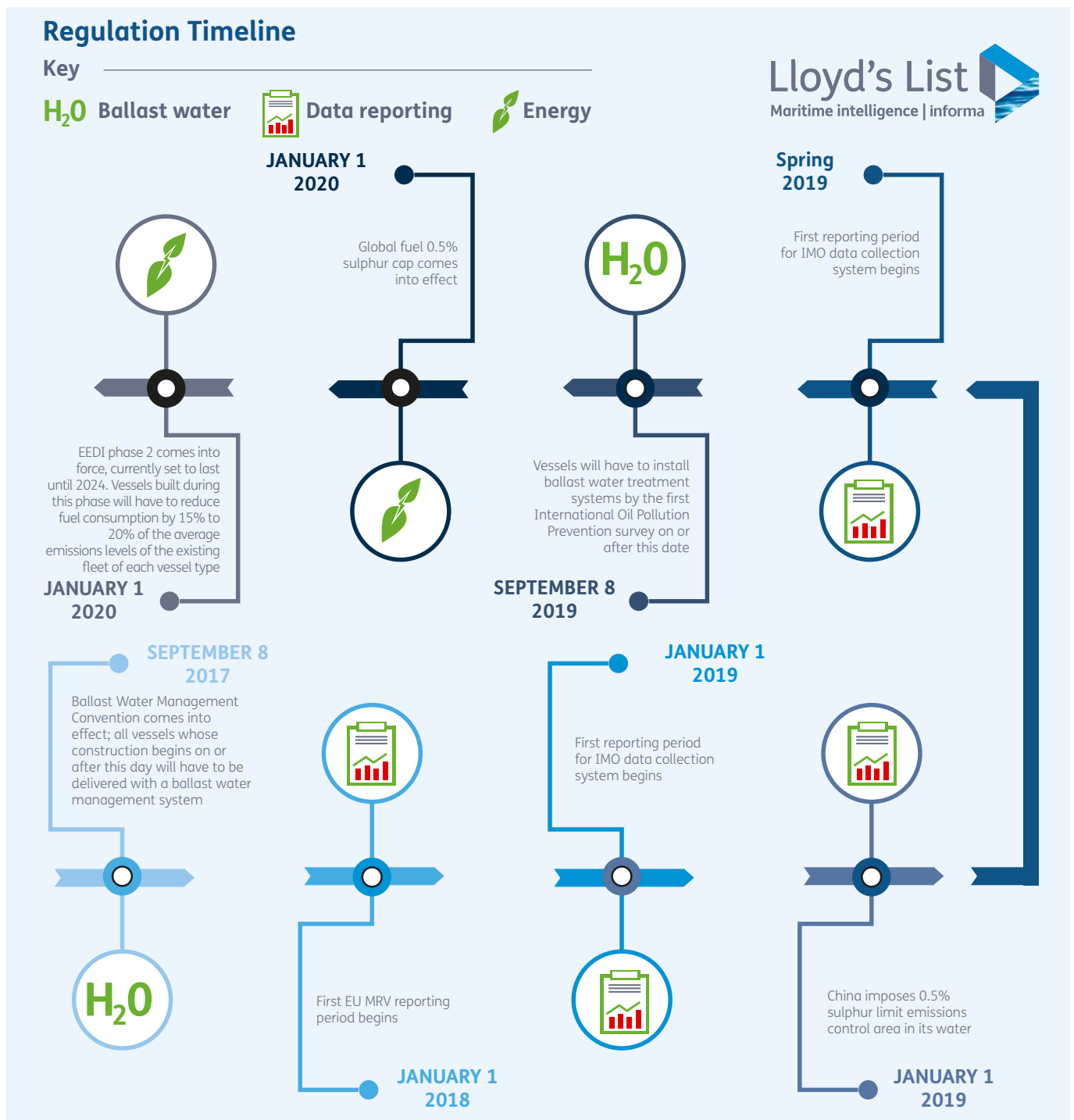
Joe Walsh
Partner
Clyde & Co

Shipping meets the environment

The next two years will see shipowners and regulators put under intense scrutiny, as a series of new requirements kicks in during one of the industry's most heavily regulated periods.

Both the International Maritime Organization and the European Commission will be looking out for detailed emissions reporting by operators while 2020 promises to impose discipline on owners who will be bound by sulphur fuel content and tighter energy efficiency restrictions. And although the IMO granted a two year breather for the implementation of the Ballast Water Management Convention, the clock is already counting down towards 2019 and newbuilds are looking at immediate compliance obligations.

Weathering this regulatory pressure will require greater administrative and operational efficiency as well as the realisation that there is no avoiding it. The burden however, will also fall on the relevant authorities to ensure implementation and prove they are capable of enforcing global environmental laws.



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the run-up to the end of this decade, as well as the creeping issue of cyber risk: “The big question is how do you resolve such an attack commercially — and via which agencies? No-one wants to be the first through the wringer in terms of finding that out, so the emphasis has to be on ensuring good cyber security right across your organisation.”

Joe Hughes, Chairman and CEO of the American Club, the only Americas-domiciled mutual P&I (protection and indemnity) association, said continued and full compliance with flag state and IMO regulations is, from P&I clubs’ perspective, essential to continued coverage and cost management.



Not unreasonably, we expect owners always to act prudently in creating a safe environment for their shipping activity

Joe Hughes
CEO
American Club

P&I insurance provides cover to shipowners and charterers against third-party liabilities encountered in commercial operations. Exposure examples include responsibility for pollution, death, injury or illness of passengers or crew, damage to cargo and damage to docks and other installations.

“The general feeling is that, especially given that the clubs are nowadays extraordinarily proactive in educating vessel owners, for instance through the generation of material which details how to reduce risk, then they – the vessel owners – should do as much to help in return. Obviously, we’re here to provide cover for unforeseen losses, but we not unreasonably expect owners always to act prudently in creating a safe environment for their shipping activity,” said Hughes.

P&Is, he said, continue to provide coverage of members’ liability risks as they have since they first were formed over a century ago, but have seen the range of potential risks increase dramatically over the years.

“We have seen some long-running exposures, such as the liquefaction of certain cargoes, become less urgent problems as those in the shipping industry have moved to address the issue.

“Emerging issues include the fire risk on mega-container ships, as access to containers once loaded can be very difficult. An associated risk is mis-declaration of cargoes, especially those which can spontaneously combust. Mega-container ships could also present a serious salvage/cargo

removal challenge in the case of a major casualty,” said Hughes.

Like Walsh, he highlighted risk of a cyber attack as a major component of any TCO blueprint.

“This is another newcomer, although the clubs’ position is, broadly, that unless an incident is an act of war or terror, there is no general exception to club cover.

Hughes said the risk of fuels and emissions violations must also be taken into consideration when operations costs are being weighed.

“Use of low-sulphur fuel post-2020 remains a subject of debate. The expectation is that shipowners will look to comply, however hard that may be, but refining capacity and access may be limited, and some wriggle room might need to be allowed. Clubs would not, in the normal way, cover fines for fuel-type non-compliance, but it might be possible for boards to exercise discretion covering the payment of legal fees in exceptional cases.

“A similar problem exists with access to LNG, although this tends to get used on more predictable A to B routes.

“A point to note is that these fuels address NOx/SOx and not carbon emissions, and I think greenhouse gases are going to be the next area of regulatory intervention and subsequent industry debate.”

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