

maritimeCEO

Shipping in 2030

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The future
of cargo handling

In association with:

 **MACGREGOR**

KEEPING CARGO FLOWING



THE WORLD ECONOMY DEPENDS ON THE MARITIME INDUSTRY

60%

of the value of seaborne trade is transported by container ships



90% of non-bulk cargo worldwide is transported by container

12 billion tonnes of cargo carried by sea in 2019

38,000 ships in the global oceangoing fleet

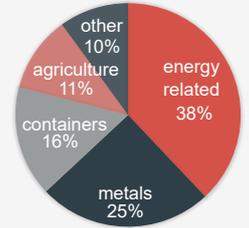


32% of the global fleet are bulk carriers



Many container ships carry **10,000** containers per voyage

80% of world trade is carried by sea



77 km length if the containers from an 11,000 TEU container ship were unloaded onto a train



98%

of containers are recyclable and shipping is significantly more carbon-efficient per tonnes carried than air, road and rail

10 In its lifetime a large container ship travels to the moon and back 10 times



MACGREGOR TECHNOLOGY IS ON EVERY SECOND SHIP AFLOAT

2,060 skilled personnel



90+ years of experience



81 offices worldwide



located in **31** countries



5,000 mobile offshore vessels and structures with MacGregor equipment

20,000 oceangoing merchant ships with MacGregor equipment



50%

of the world's fleet have MacGregor equipment installed

MacGregor is part of Cargotec **12,000** employees in **100** countries
Smarter cargo flow for a better everyday

MacGregor's expertise is sought by industry bodies when developing new standards and regulations



MAXIMISING OPERATIONAL AVAILABILITY AND MINIMISING UNPLANNED DOWNTIME

850 service experts in **60** service centres



20,000 ship visits per year



42,000 spare part deliveries per year

OnWatch Scout remotely monitors **200+** condition alarms



24/7 global support



Cargo Boost increases carrying capacity by up to

15%



4,000 ships covered under service contract



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maritimeCEO The maritime supply chain in 2030

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Welcome to this special magazine identifying the future trends in cargo handling. What has become apparent from interviewing a diverse swathe of the maritime community across the world is that we ought to expect evolution rather than revolution when it comes to how goods are moved from ship to shore over the next decade.

It's clear however that with the expansion of bandwidth at sea we are moving inexorably closer to the moment where all parts of the supply chain are in constant dialogue with one another, something that will drive efficiencies on a scale not seen since the start of containerisation in the 1950s.

Ships are set to get better at communicating with one another and those on shore, a process that has clearly been sped up by the coronavirus this year.

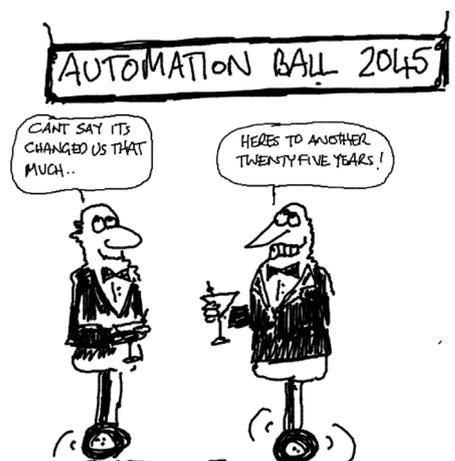
The pandemic has accelerated the uptake of remote support technologies and the trend towards increased use of automation.

In a locked-down world, the significant increase in use of remote equipment surveys and remote maintenance for critical updates over the last few months proves their business case. We have begun to comprehend the true importance of IoT monitoring and reporting infrastructure.

What needs to change now is the big picture mindset. Currently the focus of smart development has the port / vessel as its central focus, mostly developing systems around improving accuracy for ship arrivals and building predictive analytics that enable optimal utilisation of port or ship assets such as gantry cranes.

The real breakthrough will come when there is a universal realisation that the port is a part of the supply chain ecosystem. The new supply chain and logistics ecosystem reality will value the port for its facilitating role along intermodal freight networks.

The following pages ought to give readers a glimpse of the future maritime supply chain.





‘Owners want reduced cost of ownership’

Any sit-down with Michel van Roozendaal, the president of MacGregor, tends to be insightful about where shipping is heading

Michel van Roozendaal is a man in a hurry, often frustrated at the slow pace of the industry he’s involved in. An aerospace engineer by training, van Roozendaal has plenty of ideas on how shipping ought to develop and harness technology.

The president of MacGregor is well aware of what is upper most in his clients’ minds - cost efficient solutions are in demand across shipping.

“Owners want reduced cost of ownership but also an improved envelope of operations,” van Roozendaal says.

The MacGregor boss is proud of his company’s “leading edge” in innovation and, importantly, of the reliability of his products and services. He is also fully aware that, today, customers seek to simplify marine equipment management, and look to suppliers to provide data-based solutions that optimise performance and maintenance through-life.

“Operational efficiency is key,” van Roozendaal says. “We see customers are operating in an environment where sustainability is a driver for their business so we can help with optimising journeys, increasing boxes carried and mixing breakbulk types.”

In terms of transforming the face of shipping, van Roozendaal is cautious in the short-term.

The drivers for any real transformation from a client’s point of view are linked to onboard safety, sustainability,

operational reliability and reduced costs, according to the MacGregor boss.

At the same time, “ships are becoming more sophisticated,” van Roozendaal says. Digital technologies and data management are now differentiators for suppliers, he says, with systems becoming more autonomous, and condition monitoring and predictive maintenance both important to maximising availability and controlling costs. This makes MacGregor an integral link in the maritime supply chain, rather than simply an equipment supplier.

The MacGregor boss also rails against the conservative nature of the industry, something that is in part caused by a lack of regulatory clarity.

“Shipping needs a high-level aspiration and to not be afraid of failure through trying new things,” argues van Roozendaal.

One way to move beyond its traditional mindset is to embrace many of the remote ways of working that have accelerated during the coronavirus pandemic. “Remote control, remote maintenance, remote diagnostics, all these have become more commonplace this year, adding a machine learning environment to shipping,” says van Roozendaal, going on to explain how his company has carried out factory acceptance tests and repairs at sea this year using cameras and augmented reality.

On the hot topic of autonomous

“Shipping needs a high-level aspiration and to not be afraid of failure through trying new things”

vessels, the MacGregor executive feels this will be a long journey, which will start by automating some of the subsystems.

Inefficiencies in the whole cargo flow of world trade can be resolved by greater use of autonomous technology, van Roozendaal points out, adding that data-based solutions can be used to generate revenues as well as manage costs, for example by optimising carrying capacity.

Overall, van Roozendaal’s message in terms of how cargo flow and load handling will develop in the coming decade is all about evolution rather than revolution.

“In reality,” he says, “it will be incremental rather than about breakthroughs. Ships trade over a lifespan, meaning that developments take place within a 20-year timeframe.”

However, with 2030 targets in mind solutions to lower CO2 footprint will dominate research and development this decade, van Roozendaal predicts, meaning for things like automation technologies shipping will need to look to harness ideas from other industries. ●



‘We’re seeing the creation of the integrated digital ship’

A survey of upcoming tech trends has a strong focus on ship performance

The maritime technology outlook for the coming years is very much about vessel optimisation according to a survey of owners, operators and managers carried out by this title.

The fragmented nature of the tech providers and the naturally conservative, cost-conscious shipowning set will put the brakes on any huge technology changes.

“The obvious first driver this year is technology that can deliver genuine fuel savings, lower emissions and better vessel performance,” says Tore Morten Olsen, president of maritime at Marlink.

In support of that, Olsen says simplified data collection for efficiency and compliance is increasingly vital. Owners need systems that can remotely connect bridge system data with communications infrastructure to give them access to a vessel data dashboard on a per vessel basis.

Leif Bystrom, chief operating officer at MacGregor, says, “Our customers are asking for solutions to improve their performance. To keep ahead of the competition they need state-of-the-art solutions and systems so their work becomes more efficient.”

“We’re seeing the creation of the integrated digital ship”

As Magnus Sjöberg, senior vice president at MacGregor’s merchant solutions division, puts it: “Clients are asking for waste in the whole logistic chain to be reduced.”

IT as a differentiator

According to Rajesh Unni, the CEO of Singapore shipmanager Synergy

Marine Group, “The industry has started seeing IT as a differentiator rather than an enabler. The challenge remains in trying to find ways to make the best use of technology.”

Dennis Mol, vice president, digital and business transformation at MacGregor, says that customers are asking for two things in the current environment - aid to operate as efficiently as possible and a quick response time

Quite so, concurs Daniel Lundberg, a director working with Mol on developing MacGregor’s digital solutions.

“Customers want increased profitability and increased use of their ships. We can do this using big data, monitoring and supporting our equipment remotely to harness data and evaluate information before anything happens,” Lundberg says.

This is something MacGregor is already doing with its OnWatch Scout service which is taking

condition monitoring and predictive maintenance to the next level.

The smart ship

“Artificial intelligence (AI) can be used to harness both shipboard and external data to optimise vessel performance and thus reduce excess fuel consumption and, consequently, emissions,” says Gil Ofer, head of open innovation at Eastern Pacific Shipping.

To see the most significant gains from AI, however, Ofer points out that the use of high-frequency data coming from sensors will be necessary, and as such, the Internet of Things (IoT) will be a top theme for the coming year.

Manish Singh, the recently installed CEO of Videotel and Seagull, agrees with Ofer, arguing that we are on the cusp of the real adoption of the Internet of Maritime Things, as he describes it. Stronger and cheaper connectivity to ships, MESH networks onboard, greater use of sensor technology, vessel position and operational data, will deliver significant new digital tools, he says.

For Alexander Saverys, CEO of Belgian shipping giant CMB and one of the industry’s hydrogen pioneers, fuel developments are unsurprisingly his top pick for the year ahead.

“I’m not expecting any major large-scale breakthroughs because a lot of research is still in its early stages,” Saverys says, adding that he anticipates “smaller, but nevertheless meaningful breakthroughs”, which will serve as valuable testbeds in the development of larger applications.

Like other owners polled, the CMB boss says his company is focusing sharply on improved digital fleet performance monitoring. “The higher the fuel cost, the higher the potential savings,” he says.

Morten Lind-Olsen, CEO of Dualog, picks up on this widely held perception that digital fleet performance monitoring will grow strongly in the coming year. This is in no small part down to the impact of increased bandwidth at sea, he points out.

“We’re seeing the creation of the integrated digital ship,” he says. “This is partly linked to the bandwidth issue, but as I see it there is a huge focus on increased business efficiency through consolidated ships operations.”

This goes all the way from automating human/manual interactions through digital solutions to increasing machine to machine interactions through IoT data and sensor-database exchanges, Olsen explains, something that will drive more analysis and systematised planning ashore.

Olsen’s predictions are not dissimilar to Henrik Hyldahn’s, the CEO of ShipServ, who says: “The continued upgrading in IT infrastructure within shipping will create the platform to accelerate the use of data and analytics, which provides owners and operators with real transparency to analyse their organisations and business models, driving efficiencies and optimising performance and profitability. In line with this, throughout the coming months we will also see further progression in automation, which will lay the foundation for cognitive systems and intuitive interfaces, which – from a procurement perspective – will be a key element in its ongoing digitalisation.”

Big data

In Hong Kong, William Fairclough, the managing director of Wah Kwong Maritime Transport Holdings, reckons the coming year will see Big Data change the business of shipping with a host of competing platforms coming online promising to deliver unprecedented insight into the movement of cargoes around the globe.

Tommi Keskilohko, director of customer solutions at MacGregor, taps into this theme and puts it in the context of providing customers solutions to grow the earnings potential of each ship. He goes on to cite the company’s innovative Breakbulk Optimiser, which uses algorithms

“Clients are asking to reduce the waste in the whole logistic chain”

to work out the storage of a breakbulk vessel to optimise the carrying capacity and stowage options. Something that used to take days of planning is now done in an hour, he says, observing that the commercial window available to a customer suddenly opens by a day as a result.

“We’re tapping into the revenue streams of our customers,” Keskilohko says.

Turning specifically to the liner trades, Thomas Bagge, CEO of the Digital Container Shipping Association, reckons we will see a continued acceleration of smart container usage, greater adoption of blockchain-enabled platforms and like Ofer at Eastern Pacific, increased use of AI.

“What will hold the industry back from leveraging technology to achieve breakthrough results is if we repeat the same patterns of behaviour from the past,” Bagge says. “To move the industry forward,” he continues, “we need to collaborate on basic elements, similar to what has occurred in many other industries. When we are willing to change the way we work and proactively collaborate, we, as an industry, will truly benefit from technological advancements.”

Looking at all this technological change, Jörg Peschke, director of digital solution architecture at MacGregor, reckons many owners still need persuading, although he also highlights that they will only be convinced if the imperatives are fully transparent.

“Customers are unsure about the implementation of digital solutions and enhanced technologies,” he concedes. “The big question is also a simple one: What is my ROI on this? To answer this critical question, we work hand-in-hand with customers and are very open with our interfaces.” ●

Cargo flow in 2030

What will the businesses of shipping and ports look like 10 years from now?

How will the business of cargo flow and handling change over the next 10 years? It's a question *Maritime CEO* has posed to hundreds of shipping executives in recent months. Some have BladeRunner-esque visions of the ship/port interface; others are more cautious about the speed of change.

For Graham Porter, the famous co-founder of Seaspan and now head of Tiger Group Investments, the biggest change coming is in automatic trucking, likely in combination with battery propulsion.

"This will redefine the logistics of the world," Porter argues in conversation with *Maritime CEO*. "Efficiencies will improve dramatically, essentially highway trains will come about, with cargo moving 24 hours a day as there will be no limiting human driver and mandatory rest breaks. It will all be optimised to avoid rush hours. This could potentially redefine which ports are winners, displacing some of the old names."

Phil Curran, vice president at G2 Ocean, says changes in cargo handling methods over the next 10 years will be driven by technology improvements.

"As technology improves and becomes less expensive and more accessible, we are expecting many opportunities in the breakbulk sector for improved, efficient automation, especially in operations onshore," Curran says.

As an example, Curran expects shipping companies to use Radio-Frequency Identification (RFID) technology increasingly to monitor cargo from the first to the last mile.

"Tagging with RFIDs will be commonplace and will not only improve the visibility of cargo

transport along a shipment journey but also help to improve our supply chain management," Curran says.

Coordinated improvements

Kris Kosmala, a cargo handling expert and regular *Maritime CEO* columnist, says it is vital for the industry as a whole to work together to drive efficiencies over the coming decade.

"Value is created out of coordinated improvements across all port-vessel and port-cargo touch points," Kosmala reminds readers.

Looking at specific touch points reveals where the improvements and changes will be happening over the next 10 years. In the physical port-vessel interface area Kosmala reckons we will see progressive deployment of vessel mooring solutions such as smart bollards and smart quay walls based on sensors and movement suppression technology between the bollard and the vessel.

But the physical aspect of mooring systems does not create sufficient value nor competitive differentiation. There is a need, Kosmala reckons, for predictive and optimisation software to be deployed above the physical interface that would aid terminal mooring crew in both tactical planning (where and how to position vessel at the quay in advance of the arrival/departure), as well as operational decisions on securing/releasing the vessel on the day of its actual arrival/departure in port.

"The next 10 years will bring increasing sophistication of sensors and also sophistication of software capable of reading data from the sensors and predicting equipment servicing needs and optimising

repairs and maintenance on the shore and ship equipment," Kosmala suggests.

John Carnall, senior vice president in MacGregor's global services division, agrees wholeheartedly with Kosmala on this point. Carnall can see one definite big change coming belatedly to shipping, namely predictive maintenance, something that will be normal by 2030. Carnall, who comes from a mining background, points out that for miners this has been the norm for the past 15 years.

"Nowadays with algorithms you can run predictive maintenance much more flexibly. Remote monitoring will be part of the solution, but the technology will be increasingly embedded within the products themselves," Carnall explains.

The years through to 2030 will be dedicated to improving and extending software platforms capable of measuring, assessing, and making decisions on behalf of humans, Kosmala reckons. For this to happen, sensors and robotics installed on every piece of quay and ship equipment will have to include open interfaces allowing software platforms to harvest real time data from operations. This will allow managers (and management software) to evaluate performance of all pieces of equipment as one and send decisions in real time back to the individual equipment to modify its operation in such a way that the entire system of machines is not disrupted.

Cargo segmentation

Lars Martin Greiner, senior consultant at Hamburg Port Consulting, reckons individual cargo segments will grow further and further apart

in the coming decade.

Container handling will develop to be almost totally automated throughout with more and more fully automated terminals and inland terminals, Greiner predicts. Bulk will follow a similar pattern, with bulk export facilities becoming increasingly one product driven, and import terminals becoming more sophisticated depending on their hinterland and delivery requirements. Breakbulk and heavy lift cargos will become more specialised and technical, as the lifts increase, with the planning centrally controlled but the lifting emphasis itself becoming more and more the responsibility of the vessel and its crew rather than stevedores. Greiner says he still hopes to see a further development of specialised breakbulk hub terminals. However, he concedes many do not agree with him on this.

"The drivers for handling development are slowly changing," Greiner says. "The twin focus on market share and economies of scale has gone. There are a number of very large operations that will consolidate and on a different scale, while we will see an increasing number of second and third-tier feeder ports that will focus on service delivery or specific market segments."

Tim Huxley, chairman of Hong Kong-based Mandarin Shipping, anticipates far greater investment among today's smaller ports, which in turn could change ship equipment demand.

"I would expect more of the smaller ports will expand their cargo gear capability so there may be less demand for geared ships," Huxley predicts.

The strides made in container handling equipment over the past decades have been "remarkable", Huxley says, and cargo efficiency is increasingly becoming restricted by road infrastructure and space in the terminals rather than anything to do with shoreside cranes. Like Porter and Greiner, Huxley believes ports will have to become far more

automated to handle cargoes quicker.

Ship design and shipbuilding

Michel van Roozendaal, the president of MacGregor, envisions that by 2030 ships will be more advanced technically and commoditised on a positive basis, so that they are built in a far longer series; it will therefore make sense to invest in more ambitious technology.

In aviation, just two companies - Seattle's Boeing and Toulouse-based Airbus - have a stunning combined market share of 91% in the commercial aircraft market globally. Such dominance allows the pair to direct research and development more strategically, offer a limited, but generally successful line-up of products and ensure that suppliers are in their pocket.

Shipbuilding still has a long way to go to get to a more dominant position at the bargaining table, but it is slowly getting there.

Van Roozendaal, a former aerospace engineer, argues that shipping needs to properly embrace series construction if it is to enjoy true technological change.

"Shipbuilding is a perpetual repetition of building a prototype. Very few vessels are exact copies of another. That makes it a little bit of an improvisation and makes it harder for technology to make an impact and to be used more efficiently," he says, something that ought to change with the number of yards contracting thanks to the round of mega mergers going on.

"You don't see many series with identical ships," van Roozendaal observes. "There is a lot of improvising going on, so it makes less sense to optimise the design of the ship."

Further down the line, as the number of shipyards and shipowners inevitably contracts van Roozendaal says he can see ships becoming more uniform and systems such as deck handling, bridge and propulsion equipment becoming standardised. "It would be great if these systems

became better to operate with an increased transition from hydraulics to electrics. Electric systems have many benefits with greater control," says van Roozendaal.

"New shipping and shipbuilding technology for vessel management and propulsion will feature prominently in the 2020s. The recent consolidation of shipbuilding groups is well timed to provide research and investment on the scale needed to meet this challenge," says Dr Martin Stopford, the non-executive president of Clarkson Research and one of the most famous shipping analysts in the world.

Magnus Sjöberg, senior vice president at MacGregor's merchant solutions division, reveals more high-end shipowners are asking for revolutionary changes.

"You have to turn every stone and we can help with that," Sjöberg says.

Warming to the theme, Sjöberg cautions that - historically - changes in shipping have taken time.

"The shape of ships has been the same since the 1960s, but the size has been scaled up. We will see some different kind of designs coming through, but not into the mainstream straight away," Sjöberg predicts.

Greater yard consolidation ought to trickle down to the vendors where many in maritime believe a culling is necessary to drive innovation in the right direction for shipping to get the new ships it needs for the coming generation.

Frank Coles, the CEO of Hong Kong shipmanager Wallem Group, tells *Maritime CEO*: "Technology solutions are being wasted in the maritime industry because vendors and manufacturers don't solve the right problems, don't ask the right questions and don't know the right things to produce, or how to sell or promote it."

Coles says shipping is seeing an endless delivery of fragmented applications that only address a part of the solution, instead of enterprise solutions. ●

Products and services to make ships more profitable

Remarkably one in two cargo ships today feature MacGregor equipment. Here are some of the most high-tech developments

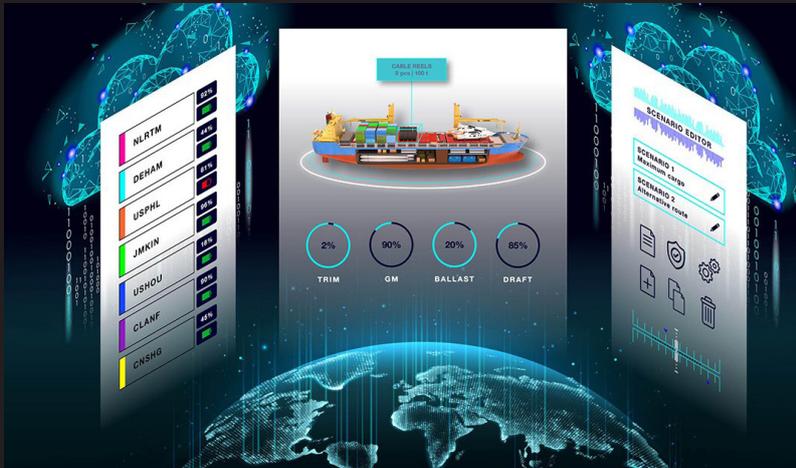
OnWatch Scout

Unplanned ship downtime could become a thing of the past thanks to OnWatch Scout, MacGregor's game changing maintenance watcher, a software solution connecting equipment to advanced monitoring systems. OnWatch Scout increases the flow of information and moves support from a reactive to proactive mode, with operational data streamed directly from the vessel, monitored, analysed and used to provide guidance on performance. The system monitors component condition and predicts potentially critical performance issues while optimising planned maintenance intervals through measurement of use and condition.



Cargo Boost

Cargo Boost increases earning potential and allows more flexibility to meet operational and market changes. Cargo Boost ensures more competitive container vessels by maximising cargo space utilisation, efficiency and lowers emissions per transported unit of cargo. MacGregor can offer an increase in a vessel's cargo system utilisation rate of up to 15%. Different cargo system configurations are analysed to establish which delivers the best investment efficiency for a client. The scope of a MacGregor Cargo Boost can vary from simple documentation updates, to minor mechanical upgrades and all the way to major system upgrades combined with MacGregor's Productivity Care service.



Breakbulk Optimiser

Breakbulk Optimiser has been developed together with customers to improve information transparency, efficiency and operational performance in the breakbulk industry. Breakbulk Optimiser uses cargo booking data and vessel route information to enhance planning capabilities, and enable fact-based decisions to be made that increase operational efficiency and business performance. The cloud-based service optimises asset utilisation by unifying information and creating a more disciplined way to plan cargo carriage. Variability in the cargo planning process is eliminated by the digital algorithm, resulting in a consistent approach being taken. It also enables a better ability to react to last minute changes and no-shows because the software optimises the stowage plan.

Automated Mooring

In collaboration with Kongsberg Maritime, MacGregor has developed the mooring solution that will enable all kinds of ships to undertake mooring operations without human intervention. This innovative and fully electrical system increases safety and eco-efficiency compared with conventional mooring operations. The system is based on a seven-axis robotic arm that takes the mooring ropes with loops and wraps them around bollards on the dock. The mooring system has redundant kinematics, with built-in movement compensation and track planning. The vessel's position against the quay will inform the robotic arm where each bollard is located, and the track planning is automatically generated by the control system. When the loop has been placed around the bollard, load-controlled winches will hold the vessel in the correct position against the quay.





Maximising lifecycle value

Ships can be enhanced during their lifetime to make them more profitable

All vessels must be maintained throughout their service life, but they can also be improved. To capture value, owners need to focus on the lifecycle earning potential of the vessel, not only on initial capex.

MacGregor modernisations, upgrades and retrofits have been proven to maximise a ship's operation availability during its long life.

Shipowners must continuously assess whether their fleets, firstly, comply with regulations and secondly, are as safe and efficient as they can be. If improvements can be made, then owners might look to modernise, upgrade or retrofit solutions especially in today's environment where vessel optimisation is the number one concern for most owners as witnessed by our survey carried on page four.

MacGregor offers many modernisation options. These include upgrading equipment, such as key components or control systems, for safer, more efficient operations and reduced maintenance costs. Going further, an owner might consider a MacGregor Cargo Boost (see page 9) which can improve the cargo

carrying efficiency and therefore the earning potential of existing containerships.

MacGregor service contracts are offered by the Global Services Division and are designed to save customers' money and reduce their maintenance administration burden.

The scope of work offered by the company in this domain includes planned maintenance and drydocking activities focused on maximising equipment reliability and availability, and enabling more effective inventory forecasting across an owner's fleet.

"In the past, the service organisation footprint and logistics management capabilities required to effectively support ships in operation and maintaining a schedule have perhaps not been fully recognised," says John Carnall, MacGregor's

"Owners need to focus on the lifecycle earning potential of the vessel, not only on initial capex"

senior vice president for global services. "With the limitations on travel and provision of onboard support seen during this year's pandemic, this has changed and customers are seeing the value of locally based specialists and remote technical expertise in ensuring that the right parts are available in the right place at the right time."

"Customers are recognising the value of condition-based information as a maintenance planning advantage," says Dennis Mol, vice president, digital and business transformation. "As an industry, we are moving towards predictive tools, which will help to eliminate unplanned downtime, ultimately reduce maintenance costs and increase revenue and profitability."

MacGregor is developing algorithms that can predict when certain equipment requires maintenance based on use and condition, rather than relying on conventional time-based service schedules. Digital advances in this arena include OnWatch Scout, a predictive tool developed to ensure that equipment is able to operate more or less continuously. ●

Virtual classrooms

MacGregor was well placed to keep clients up to speed when lockdown hit

Training in whatever industry you're in has gone through profound and rapid change this year, thanks to Covid-19. Almost overnight, people schooled behind bricks and mortar walls were required by lockdown to adjust to taking lessons by gazing at teachers from afar via computer screens.

The topic made for lively debate in a June Splash TV episode featuring the head of Ocean Technologies Group, Manish Singh, and OSM boss, Bjoern Sprotte.

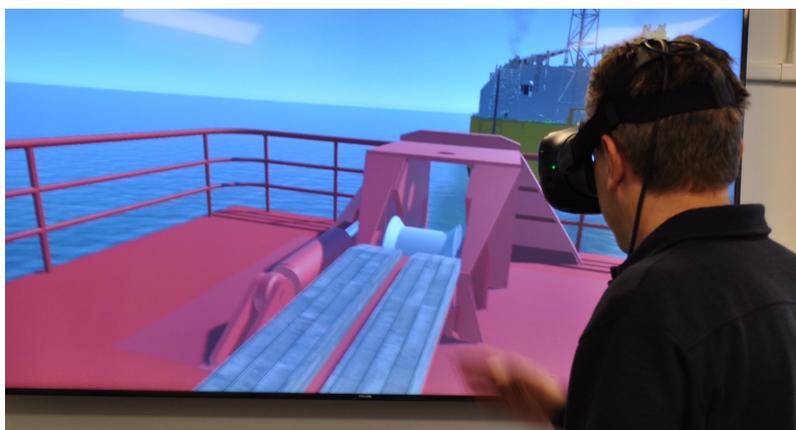
Sprotte, speaking from the ship-manager's Singapore headquarters, related how when the World Health Organization officially declared the coronavirus a pandemic on March 11 training came to a "complete standstill" overnight, necessitating a swift adoption of replacement digital tools.

"What we have seen is a more connected learning community which, in my view, really looks ahead instead of having what we call this touch and go," Sprotte said. Pre-Covid-19, when people came to a training facility, they spent time together then left, he explained, and it tended to be tricky to confirm just how successfully the lessons had been absorbed.

"With this new technology we stay connected, they share learnings and create a self-learning community by that, which is encouraging each other to learn skills and create a sense of belonging. For us that is also a retention mechanism obviously," Sprotte said.

Singh, who oversees well-known training brands Videotel and Seagull among a host of products in the Ocean Technologies Group, said shipping as a whole was still adapting to the new normal of remote training.

"Adoption of e-learning will



accelerate very sharply in the coming months," Singh predicted.

As part of its approach to training, MacGregor has continuously sought to bring people up to speed with its own technology by using the latest available learning techniques. The approach, which in recent years has involved significant investment in distance learning and other digital training tools, has put the company in good shape to respond to Covid-19 constraints.

"Through theoretical sessions and simulator experience, our training courses allow crew to practice challenging operations, experiment with new techniques, learn from mistakes and experience realistic consequences under the watchful eye of MacGregor trainers," says Dennis Mol, MacGregor's vice president for digital and business transformation.

Virtual reality simulator training is designed for both experienced and novice operators. MacGregor's state-of-the-art immersive simulator provides unique practical training. Crew obtain experience, which in real life would have demanded a huge investment in time and posed considerable risks.

The company simulates a wide variety of offshore cranes with a

genuine crane control system and full operator interface. The simulator can be configured to reflect vessel, crane type, placement and a specific load for critical operation rehearsal. It simulates weather, wave direction and height, night and day, depth, load type, component breakdowns, system emergencies and other real world challenges.

MacGregor's virtual reality training centre features an authentic operating chair for offshore crane simulations and a standing zone, where participants can walk around the simulated ship familiarising themselves with safe operation of the equipment. Refresher training and extra simulator days/hours can be provided for those with previous training.

"Making expert knowledge available to customers through simulation-based training is another information-based capability that enhances crew capabilities, operational safety and equipment reliability," says Mol.

"Digital twin-based services provide a dynamic environment that enable procedure demonstrations and training to take place, with the ability for this type of training to be undertaken by crew onboard being a planned development," he adds. ●

Tech decisions

We surveyed 200 owners, operators and managers on the future of shipping. Results and key comments below

Which sector will see more far reaching tech developments in the coming decade?



“Land-based breakthroughs will be brought to ships, not the other way around ”

- Ports 48%
- Ships 27%
- Both will develop in sync 25%

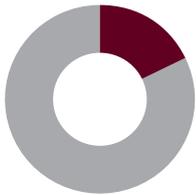
What will be the average manning level per ship by 2030?



“There will be a huge variance between short-sea and deepsea ”

- Same as today 40%
- Less than 15 28%
- Less than 10 17%
- Less than five 15%

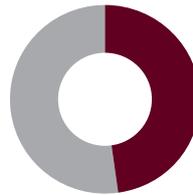
Are shipbuilders doing enough to push the boundaries of ship design?



“They’re marketing departments might be, but in reality they lack new ideas ”

- Yes 18%
- No 82%

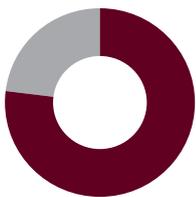
Have ship sizes plateaued?



“Owners have learnt that big is not beautiful ”

- Yes 48%
- No 52%

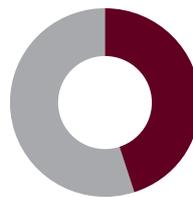
In 10 years’ time will there be far fewer ship design choices for owners? Will ships be built in far greater series?



“National giants are emerging. Bad for prices. Good for innovation. ”

- Yes 77%
- No 23%

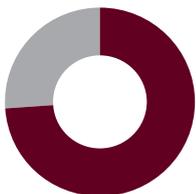
Will 5G revolutionise ship operations?



“Wait till you see what the Chinese are doing with 6G ”

- Yes 45%
- No 55%

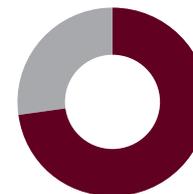
Will IMO’s 2030 environmental targets be tightened soon?



“Far sooner than people can envisage ”

- Yes 74%
- No 26%

Will the shelf life of ships become less than the traditional 25 years of age?



“10-year-old ships will soon become archaic ”

- Yes 73%
- No 27%

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