



Cross-industry
collaborations bring
**autonomous
future closer**

With decades of experience and multi-disciplinary expertise, MacGregor takes its place at the collaboration table in shaping the industry's more efficient, safer future and for making unmanned shipping a viable proposition



The concept of unmanned shipping brings with it the promise of safer, more efficient operations

MacGregor participated in the 98th session of the IMO's Maritime Safety Committee to discuss the introduction of an autonomous vessel ecosystem



The world fleet increases with every passing year, as does the number and complexity of systems on individual newbuilds. But at the same time, shipping faces a labour crisis and a widening gap between demand and supply of trained seafarers. Yet, global trade must continue, and the concept of unmanned shipping brings with it the promise of safer operations, using vessels which through machine-learning can become eco-efficient and more operationally-efficient in a way that would be impossible for human crews.

The idea of unmanned shipping has cropped up many times, but is even now often greeted with scepticism. Even only a few years ago, when automation had been tried and tested in aerospace and was in the process of being refined in the automotive industry, the topic of autonomous ships was treated as fanciful in

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many circles and faced a deluge of questions. Would today's satcom connections have sufficient capacity to enable ships to be operated remotely? Who owns the data? Could crewed and unmanned vessels sail together? What about piracy?

Now, thanks to leaps and bounds in the development of satcom and navigation technologies, these questions are being

answered. However, the technology is only at proof-of-concept stage, and autonomous shipping proponents need to work hard to ensure that their technologies are marketable and cost-effective at the outset, as well as economically viable in long-term operation. To achieve this, experts must come together and expertise should be shared at all levels including a place at the authorities' table.

Experts come together

In June this year, MacGregor participated in the ninety-eighth session of the International Maritime Organisation's (IMO) Maritime Safety Committee, which met at the UN body's headquarters in London, UK. MacGregor's role in the event was to discuss its expertise in relation to the introduction of an autonomous vessel ecosystem.

In addition to MacGregor, the Finnish delegation included four other Finnish companies, the Finnish Transport Safety Agency (Trafi) and the Finnish Ministry of Transportation. Together they were on a panel and presented the 'digital Finland' concept and outlined an autonomous vessel ecosystem strategy, highlighting the need to change current IMO safety rules and regulations to make autonomous sea traffic possible.

The session was attended by representatives from around 170 IMO-member countries and organisations. "Participating in such a high level meeting was very rewarding," says MacGregor representative **Arto Toivonen**. "Being able to contribute our expertise to the official presentation supports our strategy to shape the industry. Autonomous vessels require the IMO to alter its rules and regulations in line with industry transformation. Collaboration is crucial to success and for its part in the ecosystem, MacGregor brings its expertise in terms of cargo safety and efficiency; ultimately with a view to make future operations more sustainable."

Following this event and similar campaigns by the Norwegian Maritime Authority, as well as representatives from Denmark, Estonia, the Netherlands, the

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UK, Japan, South Korea and the US, the IMO announced that it would consider new regulations to govern the new automated vessels frontier. Not even nations with large populations of seafarers stood in the way of the proposition. The IMO will now discuss unmanned vessels at its next Maritime Safety Committee (MSC) 99. Not known as an early adopter, IMO's stance should serve as a wake-up call for sceptics that the industry is on the move.

"MacGregor wants to reshape and transform the industry to make it much more efficient, safer and more sustainable," says **Pasi Lehtonen**, Senior VP, Strategy, Business Development and Marketing, MacGregor. "In the segments where we

operate, we see a lot of unnecessary waste in the form of inefficiency, damage to cargo, and continuously dangerous working conditions. Our aim is to minimise waste from the value network; collaboration on the development of autonomous technology for container ships is a good example of where industry leaders can work together to transform the industry. We are ready to bring our considerable experience in intelligent cargo and load handling into this process."

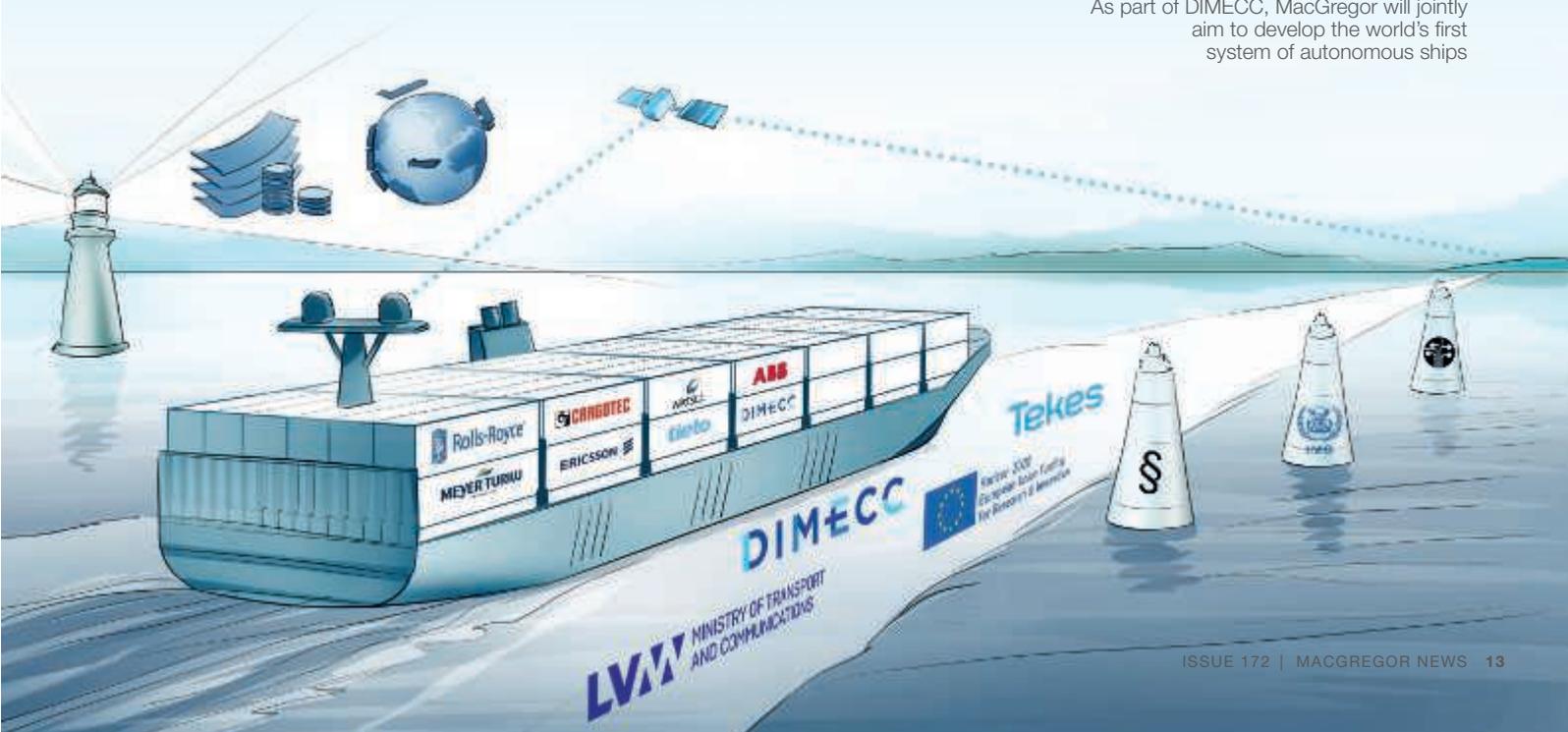
Commercial collaborations

In line with this thinking, in March this year MacGregor and Rolls-Royce signed a Memorandum of Understanding (MOU) to collaborate on research and development to explore the impact of developments in autonomy for cargo ship navigation and cargo systems on board container ships.

"This collaboration will harness both companies' unique experience laying the groundwork for the development of autonomous container ships," says Mr Lehtonen.

"As a leading provider of cargo handling solutions and services for container ships, MacGregor brings a detailed knowledge of the cargo sector and can provide valuable

As part of DIMECC, MacGregor will jointly aim to develop the world's first system of autonomous ships



insights into marine cargo operations and the technology and systems needed to make them as efficient and safe as possible,” said **Asbjørn Skaro**, Rolls-Royce, Director Digital and Systems.

The first test ground

In a more recent development, MacGregor has announced its participation in the advanced co-creation ecosystem, One Sea. Founded in 2016 and led by DIMECC (Digital, Internet, Materials & Engineering Co-Creation), the goal for the ecosystem’s partners is to jointly develop the world’s first system of autonomous ships.

Their shared vision is to enable fully remote-controlled vessels in the Baltic Sea in three years and to achieve autonomous commercial maritime traffic by 2025. The Baltic Sea has long been a hotbed of innovative thinking thanks to its status as an emission control area (ECA), with operators in the region managing to comply with some of the maritime sector’s strictest regulations – often, even exceeding them.

Now, under the One Sea initiative, it is to become one of the first testing grounds for autonomous ships, and in August DIMECC announced opening the first globally-available autonomous maritime test area on the west coast of Finland.

Managed and controlled by DIMECC, the test area is open to anyone wishing to test autonomous maritime traffic, vessels, or technologies related to it.

Comprising a consortium of top industry players including MacGregor and Rolls-Royce as well as Wärtsilä and ABB, with support from the Finnish funding agency TEKES, the aim is to cultivate a fully autonomous maritime ecosystem in the Baltic Sea, which will provide a roadmap for cooperation and coordinated development between industry, research institutes, class societies and authorities, enabling the adoption of autonomous vessels elsewhere around the globe.

When it comes to development of systems and solutions for technologically advanced, safer operations, MacGregor has a key role to play, explains Senior VP of R&D and Technology, MacGregor, **Alexander Nürnberg**. “The benefits of co-creation are obvious,” he says. “Software experts, together with systems and equipment experts can improve efficiency and safety throughout the whole value chain.

“MacGregor started the transformation journey several years ago and is proceeding step-by-step towards autonomous equipment operations and eventually autonomous vessels. The steps we have already taken on this journey include the ability to have greater connectivity to

equipment. This means that we can undertake performance monitoring and further enable condition-based monitoring and predictive maintenance.”

Pushing performance boundaries

The name MacGregor has long been associated with market-leading cargo handling technology and it has not stopped pushing at the boundaries of performance excellence. In recent years, MacGregor has turned traditional cargo handling system design on its head through its PlusPartner concept. It is an innovative approach that starts with the cargo profile and works forward from this point to ensure that a ship design considers all components of the cargo handling system as a whole. This maximises cargo carrying efficiency, flexibility and profitability. The cargo systems onboard existing ships can also be re-considered using the same principles.

With this optimisation of cargo handling processes and such a rich pool of expertise in vessel automation, shipping looks to be eliminating the weakest links in its value chain in the coming years. It is no surprise that so many nations around the world now regard fleets of unmanned vessels as an inevitable and imminent development. ■

Bulk shipping to benefit from automation advances

MacGregor and ESL Shipping Oy, part of Aspo Plc, have agreed to jointly develop and test an autonomous discharging feature on MacGregor bulk handling cranes, designed to offer safety and efficiency advances.

“Autonomous crane operation improves efficiency and safety,” says **Leif Byström**, Senior Vice President, Cargo Handling at MacGregor. “Discharging operations can be monitored and controlled from the bridge and therefore eliminate the need for personnel in hazardous operational areas.”

ESL knows MacGregor cranes very well and relies on their proven technology. The cranes will be fitted on board ESL Shipping’s two new liquefied natural gas (LNG)-powered Handysize bulk carriers.

“Our new environmentally-friendly LNG fuelled ships will be operated on very demanding trades with a high number of voyages, port calls and crane operating hours annually. Autonomous operation will further increase our competitiveness and offer our clients unforeseen efficiency and safety advances,” says **Mikki Koskinen**, Managing Director at ESL Shipping Oy.

“We are very excited about collaborating with ESL on this development project,” continues Mr Byström. “By combining the expertise of a forward-thinking shipowner and operator with our expertise in intelligent

cargo handling, we can reduce unnecessary waste in the value chain and therefore develop safer and more efficient solutions for unloading bulk cargoes.”

The vessels are planned to enter service during the second quarter of 2018, when their automation testing capabilities will commence.



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