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# An ETF plea to the industry and regulators for a human-centred approach to automation in shipping

Brussels, 13 July 2018

## A changing world

The world is changing fast, and so are the ways of producing and exchanging goods due in particular to the rapid advances in technology and the trends towards an increased automation in the workplace. Yet it is difficult to accurately predict the impact on employment and what the job market will look like twenty to thirty years from now. Shipping is not immune from these developments. Shipboard technology, information and communication data exchange and shore-based support systems are fast evolving and one can only wonder what the impact for shipping and seafarers will be in the medium-to-long term. Many stakeholders are endeavouring to answer these questions and shape the future of the shipping sector. Against this background, seafarers' unions across Europe are prepared to engage in the debate around autonomous or smart ships to help gaining a better understanding of the issues and opportunities that will be raised whilst avoiding any self-interested speculation. ETF and its affiliated unions are indeed prepared to step up their action as agent of change in support of a smooth transition that will result in improved safety and bring about high-quality employment and training for European maritime professionals.

## Democratising new technologies

The benefits that new technologies can bring are often discussed only in terms of growth, productivity gain and profitability, whilst the reduction of drudgery of work, the improvement of working and living conditions and the contribution to the wider society are often neglected. Trade union organisations are there to call attention on the need to ensure the economically, socially and environmentally sustainable development of new technologies. For the shipping industry in the near and distant future, this will require investing in the human element to ensure continued employment and improved job opportunities for seafarers and other maritime professionals

New technologies and artificial intelligence assisting seafarers could promote safer and more efficient workplaces. New technologies and artificial intelligence leading or replacing seafarers is a whole different story. Systems and machines cannot simply replace those men and women who are shaping the sector, and it is not acceptable for a small group of people controlling the data and systems to monopolise all the political and economic power and benefits. And what about the social and economic

impact for countries with a large percentage of seafarers in the population if they are simply replaced by algorithms? In this sense seafarers' unions can help to democratise the decision-making process on the way new technologies are used and steer it to the benefit of safety, efficiency, and environmental performance of the shipping industry, to the benefit of the working lives and conditions of maritime professionals, and the sustainability of maritime clusters in Europe. Seafarers' unions are determined to make their voice heard, be it through collective bargaining at company-level or engaging in debates with European or global regulatory bodies. In particular, ETF and its umbrella organisation the ITF will actively contribute to the regulatory scoping exercise aimed at looking into how safe, secure and environmentally sound autonomous shipping operations may be addressed in IMO instruments. ETF and ITF will indeed firmly advocate for a human-centred approach to autonomous systems in the IMO sessions amending, revising and drafting the relevant international regulatory framework.

## The European context

The EU, European maritime nations, and European shipowners are following very closely technological developments for shipping. The EU is driving the change towards fully integrated transport systems with autonomous ships in the continent. It is awarding huge amounts of funding to projects and manufacturers to launch their plans for autonomous ships<sup>1</sup>, and has launched several initiatives to take forward the digital agenda in shipping<sup>2</sup>. In this context the European Commission believes that digital and technological developments in shipping will result in a shift from on-board to on-shore employment requiring new, innovative skills.

European Member States like Norway and Finland are at the forefront of developing and testing autonomous ships<sup>3</sup>. Denmark is prioritising digitalisation as part of a national action plan to promote the growth of the industry<sup>4</sup>. These testing areas are useful input for those who are still cautious of implementing new technologies and need reassurances that new systems are robust and safe enough to comply with all legal and safety requirements. Today there are still many regulatory challenges, pure technological hurdles, safety concerns, and insurance and economic issues to be considered. But as soon as technologies will be cheap enough to pass a cost-benefit analysis in comparison with current practices, the legal framework will adapt and so will the fleet.

## Five guidelines for sustainable digital shipping

In view of the above, it is more important than ever to have a say in the evolution of digitalisation and automation in shipping. What future do we want for the shipping industry in Europe and for European seafarers and other maritime professionals? The ETF is of the view that 'sustainability' should be at the heart of every policy and business decision regarding digitalisation and automation in shipping. New technologies should be used in a way to make the industry more sustainable on a social, economic and ecological level. The below guidelines are intended to provide guidance for decision-making on this topic and a framework for assessing how digitalisation and automation in shipping can contribute to a more sustainable future for the industry and the people working in it.

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<sup>1</sup> <http://www.unmanned-ship.org/munin/>

<sup>2</sup> [Digital Transport and Logistics Forum \(DTLF\)](https://ec.europa.eu/transport/modes/maritime/digital-services/e-maritime_en) and [https://ec.europa.eu/transport/modes/maritime/digital-services/e-maritime\\_en](https://ec.europa.eu/transport/modes/maritime/digital-services/e-maritime_en)

<sup>3</sup>

<https://www.km.kongsberg.com/ks/web/nokbg0240.nsf/AllWeb/4B8113B707A50A4FC125811D00407045?OpenDocument>

<sup>4</sup> <http://www.seatrade-maritime.com/news/europe/denmark-targets-digitalisation-as-it-sets-out-global-maritime-hub-plans-by-2025.html>

## 1. No 'one-size-fits-all'

Firstly, it is important to acknowledge that certain shipping services or operations are more fit for being automated than others. The integration of digitalisation and automation in shipping services will be a dynamic process and will certainly not be the same for the whole of the industry. The scenario of all shipping services being fully automated and autonomous in the short-term is most probably not a very useful or realistic one. Hence, it is important to acknowledge that there are different levels of change and the definition offered by the IMO is very interesting in this regard<sup>5</sup>. The Maritime Safety Committee of the IMO endorsed a framework which provides a definition of "Maritime Autonomous Surface Ship (MASS)" and a set of four varying degrees of autonomy. This differentiation hence allows for a better and more accurate assessment of the implications for e.g. job security for seafarers. While acknowledging that developments regarding automation will change the nature of work of seafarers and could diminish their current role and tasks, the ETF advocates an approach that recognises the variation of possible usage of new technologies for different shipping services.

## 2. Safety first

When contemplating sustainability, there is a need to consider the risks as well as the potential of new technologies to make the industry safer and more secure, and to improve the quality of work at sea. The combination of new technologies (electrification of propulsion systems, increased automation, connectivity to shore, computing power and analytics capabilities) and artificial intelligence can lead to new aids for safer navigation, preventative maintenance, and shore-based support which would greatly increase efficiency and safety of operations.

While being of the view that new technologies should in first instance be used to assist seafarers and shipping companies in enhancing the levels of safety and security, the case of autonomous vessels should also be considered. Algorithms fully in control of autonomous vessels should be able to comply with international regulation (SOLAS, COLREGS, UNCLOS) which is very complex to realise. How to ensure immediate emergency response if no one is on the vessel? And what about the UNCLOS requirements on manning? Suggestions of developing new regulations (which is being proposed for COLREGS in particular) specifically for autonomous vessels should be treated with the utmost care, and the existing international regulation should contemplate all the safety and security implications of making shipping services more automated.

For example, there are still many concerns as to the faith that we can put onto an algorithm to save the lives of human beings. In case of autonomous vessels sailing together with manually controlled tugs and towage vessels in dense traffic zones there is an increased risk of accidents and additionally there are moral questions that arise. How should an engineer programme the reaction of an autonomous container ship if it had to choose between a collision with a smaller ship that would destroy that ship and its crew but would leave the container ship unharmed, or to run aground resulting in a huge profit loss for the company? The ETF's perspective would put human lives above profit, but who knows about the economic operators' intentions?

In addition, there is the question of liability in case of accidents and who holds it if there is no master onboard. It would be difficult to believe that "remote operators" would have the same liability as a master today. The ETF is of the view that the shipowner or the shipping company should always be the liable party in case of accidents involving autonomous vessels.

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<sup>5</sup> <http://www.imo.org/en/mediacentre/pressbriefings/pages/08-msc-99-mass-scoping.aspx>

In addition, there is the threat of cyber pirates hacking into automated shipping systems and putting security of shipping services at risk. Cyber security is hence a major topic of concern for all stakeholders seeing an interest in digitalising and automating their operations.

### 3. High standards

The many concerns regarding safety, security, and liability require an environment where the highest standards prevail in order to create a robust, safe and secure regulatory framework. Here the issue arises of the different jurisdictions governing and impacting on the implementation of new technologies in shipping and the creation of possible parallel legislative requirements. If flag state regulations and requirements fail to create the best environment for safe operations, then better standards from IMO regulations and first registers should prevail. It would not be acceptable to put the lives of seafarers and the marine environment at risk by implementing new technologies in shipping and piloting automated vessels flying the flags of states with the lowest safety, security and environmental requirements.

### 4. Life-long-learning

In further view of ensuring sustainability, adequate training, education and upskilling of seafarers to cope with these technological developments is primordial. Training and education of both current and future seafarers will be highly important considering on the one hand those tasks which may be made redundant on a highly automated ship, and on the other hand those competencies that will be needed to interact with the new systems and machines and to manage those elements of automation that could assist seafarers to perform their tasks and make ships more efficient, safer and greener.

International regulation will have to follow these needs accordingly: new skills shall be required as an extension of the necessary minimum competence to be able to navigate, operate and maintain ship safety as defined by the STCW Convention and in accordance with the rules of the ISM Code.

At the same time many of the current required skills for masters and engineers will most probably not change in the future. Traditional critical skills will continue to be needed but will have to be complemented with skills to control and manage digital trends and changes in the (near) future (e.g. cyber & digital, risks & reliability, system engineering & integration, and transversal skills such as critical thinking). This will require for an increased investment of shipping companies in continuous training and a company culture of lifelong learning.

Providing the skills, knowledge and competences needed to work with these new concepts and technologies will in turn stimulate the demand for qualified European seafarers. In addition, current seafarers should be able to be re-trained or upskilled in view of providing them with more sustainable long-term career perspectives towards a career ashore in the maritime industry.

In order to ensure the sustainability of the life-long-learning process, cooperation on a European level between the industry, unions, training providers and authorities will be needed.

### 5. Digital shipping = Green shipping

Lastly, new technologies in the shipping industry should serve to better preserve the (marine) environment and help to decrease the air pollution exhausted by the shipping industry. In case of investment in research and development of new technologies for the shipping industry priority should be rewarded to alternative green ship technologies to propel the vessels of the future (wind, sun, waves energy, towing kites, Flettner Ship, etc.) and marine technologies aimed at reducing if not removing the dependency on fossil fuel.

Such vessels may offer opportunities to both meet the demands of environmental protection whilst safeguarding and even expanding job opportunities at sea and in the maritime cluster as a whole. The introduction of alternative fuels or marine technologies aimed at reducing if not removing the dependency on fossil fuel often implies a change in competences needed. Therefore, investment is also required in green skills to ensure the knowledge, skills and competences needed regarding energy-efficient navigation, alternative fuels, and marine technologies.

## Conclusion

The world is changing fast and although the pace and impact of technological developments will vary from one sector to another, they will touch the lives of every single person and every single economic sector. The European institutions and marine manufacturers are playing a very active role in driving forward innovation and the development towards autonomous ships. The ETF is putting question marks as to the inevitability and added value of technological developments resulting in the automation of shipping operations. ETF and its affiliated organisations across Europe stand ready to play a crucial role in helping to democratise the decision-making process of the way new technologies are used and steer it to the benefit of maritime safety, the environmental performance of shipping, and equally important to the benefit of the working lives and conditions of maritime professionals and the sustainability of maritime clusters in Europe. This is the condition on which new technologies will realise their full potential for an industry based on social, economic and ecological sustainability. The five guidelines for sustainable shipping services are intended to provide European stakeholders with the elements needed to ensure their decisions are aimed at achieving this goal.