AUTOMATED AND CONNECTED SHIPS & SHIPPING

The EU to support European Maritime Technology Sector to be ahead of international developments

POSITION PAPER

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The European Maritime Technology Sector is specialised in the building, maintaining, repairing, converting or equipment of the most innovative, sophisticated and high technology ships. The sector is therefore a worldwide frontrunner on developments regarding connected and automated waterborne transport.

Nevertheless, significant investments in research, development and innovation is essential for the further developments of technologies in digitalisation, automation and autonomy in the shipbuilding processes to secure the competitiveness of the European Maritime Technology Sector as well as to enable the sector to cope with its societal challenges. To achieve this, with the financial support from European and international programmes, the sector will be able to remain at the forefront of innovative shipbuilding and maritime equipment manufacturing.

The existing business opportunities for maritime and ICT industries can boost Europe's competitiveness, if a worldwide IP and data protected, cyber safe and equal level-playing field is established for the benefit of the European Maritime Technology Sector. At the same time, Europe can aspire to become again competitive in the building of standard ship's types, currently built in Asia, on the condition that complex ICT integration expertise remains in Europe.

Redefining shipping

Logistic chain - Interconnectivity

Digitalisation and enhanced data flows will connect ships, port and infrastructure and improve logistic flows. Becoming part of the interconnected mobility system, connected and automated waterborne transport has the potential to increase safety, operational efficiency as well as reduce its environmental footprint.

Levels of autonomy

There is clear difference between automated transport and connected transport and, in particular, when it concerns automation there are various levels of automation envisaged according to different ship's types and trades. The waterborne sector will gradually evolve from ships with automated processes and decision support to autonomous ships able to take decisions and determine actions by themselves. However, autonomous shipping would not necessarily mean that the vessel will be unmanned, and the need for and the level of autonomy may vary according to ship's types and trade. SEA Europe believes that interconnected and automated transport categorised in different levels of autonomy needs to be further defined and internationally agreed to ensure regulatory consistency.

Societal challenges

Increasing automated and connected ships and shipping will trigger the need for new training programs developing new competencies requiring a transformation of skills. e.g. for the crew, staff of shore support centres, as well as for employees in shipyards and maritime technology companies.

In this context, SEA Europe supports a series of initiatives taken to improve the skills of crews and operators of connected and automated ships. SEA Europe supports the industry in its adaptation to digitalised production processes as Europe's shipyards and maritime equipment manufacturers are facing a scarcity of skills, at a moment when the need of highly qualified people is key to cope with the challenges of digitalization, automation and new technologies in the maritime sectors. The inability of the industry to find rightly skilled workforce has the potential to undermine the future competitiveness of the industry and of the whole maritime economy in Europe.

Technological environment

Connectivity

Ultimately, autonomous navigation is not about trajectory but knowledge of the ship's surrounding environment (Situational awareness) and the ability to react autonomously on these surroundings. The main challenge will be to certify safety-critical use of technology giving the ships the knowledge context in which they evolve.

The interaction between ships needs to be carefully assessed in order to prevent any disruption on communication and intellectual property right issues, considering that data will have to be exchanged between ships regardless of their degree of autonomy. To that end, communication systems between autonomous ships and shore/authorities need to be properly developed according to different situations such as open sea, coastal and inland navigation, port areas, or offshore operations. These communication systems will increase the overall safety and security reducing and reduce the burden of bureaucratic procedures.

Cyber security

Increased use of digital tools in the maritime industry is leading to an increased cyber threat due to the greater digital exposure of important and sensitive information. The reduction of vulnerability of ICT and Operational technology (OT) systems will be critical to the safe and successful operations of remote and autonomous ships - allowing the waterborne sector transformation into connected shipping.

The security strategy needs to be addressed primarily from the ship digital infrastructure with well designed and implemented responsiveness to cyber threats. Whilst the International Maritime Organisation (IMO) has already issued *Guidelines on maritime cyber risk management*[1] and adopted a Resolution on Maritime Cyber Risk Management in Safety Management Systems[2], there is a further need for common standards and common requirements to be widely covered by an international "Cyber Type Approval Certificate".

SEA Europe believes that the EU should be at the forefront in developing standards and requirements to safeguard the competitive advantage of the European industry. In this regard, SEA Europe considers the guidance of the International Association of Classification Societies (IACS) on how to develop and maintain the cyber integrity of ships as a good basis to develop such a certificate which will help to clarify any related liability issues, equally on the side of the equipment installers or integrators.

SEA Europe is convinced that a common share of best practices and cross-learning from related industries, including the ICT industry, and involvement of Authorities on counter-measures to reduce the vulnerability and improve responsiveness to cyber-attacks will be the most effective way to continuously increase the resilience of the entire sector.

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[1] MSC-FAL.1/Circ.3 of 5 July 2017 ON GUIDELINES ON MARITIME CYBER RISK MANAGEMENT
[2] RESOLUTION MSC.428(98) (adopted on 16 June 2017) on MARITIME CYBER RISK MANAGEMENT IN SAFETY MANAGEMENT SYSTEMS

Regulation and Policies

International – Adaptation of legislative framework to ensure safe navigation

Future autonomous shipping will be possible through a worldwide distributed network ensuring one common control which has to be achieved through international cooperation.

The IMO needs to properly consider the timely adaptation of the international regulatory framework able to embrace the safety aspects, the human element aspects and the technology developments all the way up to the highest levels of autonomy level in a goal-based approach.

The safety aspects entail to define clear international navigation rules for priority delegation especially in case of interaction between highly autonomous vessels and those with a lower degree of autonomy. The ship's situational awareness technology needs to be rapidly incremented to initiate a learning process for future safety critical applications such as remote operations. Ultimately, any situational issues will need to be implemented via the SMS (Safety Management System under ISM Code) and ISPS (International Ship and Port Facility Security Code under SOLAS).

Europe – Connected and Automated Ship & Shipping enabler

In the light of European Member States and classification societies having already designated national waters areas where trials can be carried out and developing verification standards for remote navigation, a European strategy vision 'Developing a smart inland/maritime transport ecosystem' needs to be developed.

This European strategy will proactively support the development of fast enabling national legislation to allow autonomy – and to create international projects for autonomous tests between several European Member States and to foster the development of distributed network for short sea shipping, offshore activities and inland navigation (as already initiated through EU VTMIS assessment). Experience gained can then feed in the IMO process to further build on international guidance to allow trials of autonomous ships in international voyages and help complete the amending process of the international regulatory instruments.

All relevant funding or financing opportunities offered by existing and/or future EU programmes and instruments, both maritime-related and horizontal, have to encompass the opportunity to support technology research and development activities, putting the European Maritime Technology Sector at the forefront of developing connected and automated ships & shipping.

Conclusion

The development of autonomous ships can create a competitive advantage for the European Maritime Technology Sector provided that Europe remains amongst the fastest developers and that the necessary international regulatory changes are taking place fast enough.

Since the decision-making process within the IMO may take some time, SEA Europe recommends that the EU takes the first concrete steps with regard to inland, coastal, offshore activities and short sea shipping, inter alia, by facilitating safe trial operations in European waters and by supporting fast development of innovative technology and cyber-safe standards.

The objective is also to develop an adequate framework for educating and training needed for current and future employees in shipyards and maritime equipment manufacturer companies, and by establishing a financing framework which supports both RD&I as well as support for frontrunners in terms of uptake of innovation.