

DRONE VESELS –PROBLEMS OF AUTONOMY IMPLEMENTATION

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A logical continuation of the development of maritime transport is automation and reducing the dependence of the transportation process on people on board. Creation of autonomous (unmanned) vessels for commercial operation is not far off [1]. At the same time, there are security and safety concerns, alongside with issues including cybersecurity, in maritime transport, as well as concerns about the negative employment consequences of seafarers, most of whom are from developing countries.

The term "autonomous vessel" differs from the term "unmanned vessel". The former can operate at different levels of autonomy, including a partially autonomous regime (with human participation) and a fully autonomous regime (which does not require human intervention). The use of autonomous vessels opens up significant opportunities for shipping companies. The operation of autonomous vessels can also be made more environmentally friendly, as such vessels will run on alternative fuel sources, without ballast and with zero emissions. In addition, if there is less or no crew on board, there will be less debris and wastewater to be treated [2].

Autonomous vessels can potentially be used for a variety of purposes, including rescue operations, emergency oil spill response, passenger ferry services, towing, cargo transportation and as vessels providing offshore platforms (Fig. 1) The new vessel are going to commence their first voyage appear by 2030 or earlier.



Fig. 1. Waste Shark – autonomous robot for collecting plastic and garbage.

In September 2016, tests of the surface autonomous robot Waste Shark began to collect plastic debris from the water in the port waters. Such works can appear in various major ports around the world. In 2018, the Finnish company Finferries introduced the autonomous ferry Yara Birkeland (Fig. 2). Delivery by sea by means of an autonomous vessel should replace freight road transport in order to reduce pollution of the environment by the products of combustion of diesel fuel. The new vessel is provided by electric motors that are powered by batteries. The vessel does not use ballast. The Norwegian electric container ship Yara Birkeland was launched in 2020. The vessel will make its first autonomous voyage between the two cities by the end of 2021 – a small team will remain on board to monitor the autonomous operation of the ship's systems.

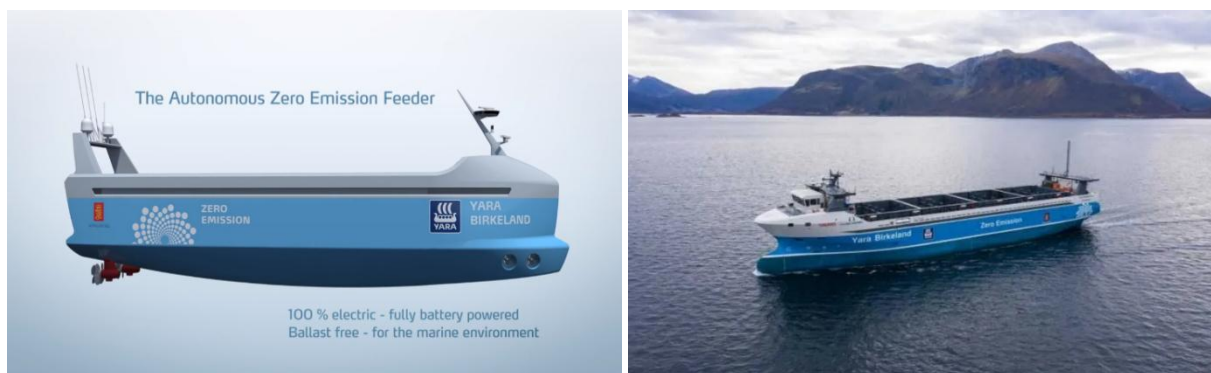


Fig. 2. Norwegian electric container ship Yara Birkeland, 2020

Yara Birkeland is capable of carrying up to 103 containers at a speed of about 13 knots – the vessel will transport fertilizers between three ports in southern Norway. Yara is confident that such cargo ships will have a positive impact on the environment. According to the developer's estimates, in a year the m/v Yara Birkeland will be able to replace about 40,000 road haulages, which will significantly reduce emissions. In addition, the developer is confident that this will reduce traffic congestion and play into human safety, as the vessel is completely unmanned.

Conclusions

Analyzing modern online forums and videos, it is obvious that seafarers and people involved in the maritime industry are skeptical of modern ship's automation ideas, as the seafaring profession may become obsolete due to unmanned technology and telemetry development. According to superintendents and captains, in the next 50 years there will be no large-scale and crucial changes in shipping, and sailors will be just as in demand [4].

The reality is that the modern shipping industry cannot afford expensive vessels. It is much cheaper to hire people than to build vessels that will sail on their own without crews. In the open sea there are many emergency situations of technical and organizational nature, which can only be solved by human. Currently, the new fleet is mostly not in operation, which is gradually becoming obsolete. Replacing old ships with new ones is not a rapid process, modernization costs a lot of money. Paying for the services of a crew capable of solving all the problems that arise now is much more profitable.

It is worth noting that the full potential of unmanned vessels will be revealed only after a change in existing international law, which does not yet provide for their operation, and will take a long time.

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