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**Autonomous Navigation in the Russian  
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## Autonomous Navigation in the Russian Federation

The meaning of maritime transportations for the world globally can hardly be overestimated. The innovations, digitalization, and further possible improvements of maritime transportation is a vital development strategy for resilient, ecology friendly, and sustainable shipping.

Autonomous navigation is one of the technologies within the maritime transportation development strategy.

By now, the technology of autonomous shipping is among the vital directions for maritime transportations in many countries, like Norway, Republic of Korea, Japan, Denmark, Germany, the Russian Federation, and many others. States represented in the International Maritime Organization, for the purpose of autonomous navigation technology development, have already reviewed the majority of their International Conventions to identify whether they are ready for a new model of ship operations and control.

While the International Maritime Organization is dealing with the development of the Code of Maritime Autonomous Surface Ship Safety (MASS Code), several countries have already initiated autonomous shipping projects in their waters. In Russia, the autonomous shipping project is under development and implementation since 2019.

In general, the technology itself is a set of equipment and software installed on the ship that allows ship control, monitoring, and operations to be executed from the Remote Operations Center. The technology consists of several modules, such as the autonomous navigation system collecting and analyze the environment, keeping the ship along the given route, offering automatic decision-making on maneuvering; optical surveillance and analysis system detecting and recognizing surrounding objects and transmitting the data about them, remote engine and technical monitoring; remote control station, and some others.

Within the autonomous navigation project, two new ro-ro ferries Marshal Rokossovsky of 2021 year of built and General Chernyakhovsky of 2022 year of built have been equipped with autonomous navigation equipment with the dedicated Remote Operations Center has been built in the Port of Saint-Petersburg.

Both vessels are now operated partly in remote operation mode. The ferries Marshal Rokossovsky and General Chernyakhovsky (main dimensions are: length overall – 200 m, beam – 27 m, deadweight – 11900, draught – 6 m, main engine – 2x6000 kW) are operating in the Baltic Sea, at Ust-Luga – Baltiysk route of 518 nautical miles. Since November 2023, the vessels have been in commercial trial operations, having reached more than 1,500 hours of remote operations for each of the ferry.

In September 2023, both ferries, the Saint-Petersburg Remote Operations Center was certified by the Russian Maritime Register of Shipping (RS) and received ROC MASS Statement of Compliance. Both vessels were also certified by the RS as the ships of RC<sub>mc</sub>-MC<sub>ds</sub> category of autonomy (remote control at sea and manual control with decision taken support at narrow straits and port entrances).

As remote operations require some dedicated skills and knowledge from the staff both onboard the ship and in Remote Operations Centers, several companies in Russia involved in Autonomous Navigation Project has developed the Autonomous Navigation Simulator. The

simulators have been deployed in the Russian University of Transport (Moscow) and State University of Maritime and Inland Shipping (Saint-Petersburg). The Ministry of Transport of the Russian Federation with the help of its subsidiaries bodies has developed and approved the relevant training programs. Personnel deemed to be involved in Autonomous Navigation Project onboard the remote operated ships and in Remote Operations Center are supposed to pass the training as appropriate at one of the simulators.

Apart from the big industry-specific project, Russia also has small educational and research university developments in the field of autonomous navigation. In particular, within the framework of the university support program Priority 2030, initiated and supported by the Ministry of Science and Higher Education of the Russian Federation, the Russian University of Transport has developed a mock-up of an autonomous ship (MAS) to test various algorithms for autonomous navigation, as well as to create an algorithm for a lower-level integrated control system for managing systems and devices of MAS.

Meanwhile, Russian legislation is nowadays are going ahead in autonomous shipping developments. The dedicated Federal Law (No. 294 dated 10 July 2023) was developed, approved, and entered into force in September this year to promote and regulate the autonomous shipping. The Law itself has amended several national Codes and Federal Laws such as Code of Merchant Shipping, Federal Law On Internal Sea Waters, Territorial Sea and Contiguous Zone, Code of Inland Water Transport, Federal Law On Transport Security, and Federal Law On Seaports in the Russian Federation and on Amendments to Certain Legislative Acts of the Russian Federation.

Federal Law 294 as well has required several regulatory acts to be drafted, discussed, approved, and issued to make it workable. This task was initiated by the Ministry of Transport of the Russian Federation. In total, 4 Government Decrees, 12 Orders of the Ministry of Transport, and 2 Orders of the Federal Tax Agency have been issued. The mentioned Governmental Decrees and Orders are set in force for the period of six years, from the 1st of September 2024 till the 1st of September 2030.

Those regulations and order determine the general positions of Federal Law 294 and prescribe the way they should be implemented. They cover requirements for Remote Operations Management Organizations, electronic contacts and agreements, assignment of MASS unique identifier, rules to keep logbooks, rules to issue Minimum Safe Manning Certificate for remote crew of the autonomous ship, regulations for autonomous ships control, certification of remote crew, requirements for autonomous navigation systems while ship manoeuvring in the seaport or at approaches to the seaport, amendments of general navigation and anchoring rules.

We hope the autonomous shipping will bring the wide range of benefits in the future including abatement of maritime transportations costs, elimination of casualties related to human element, reduction of greenhouse gas emission via cutting of fuel amount used, and many others. We also believe the autonomous shipping will make our seas cleaner and safer.