

# Modern Tendencies and Development of Navigation System

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## Abstract

Urgent and debatable problems of Sea Navigation, consists in a research of various navigation technologies. It is necessary to mark out those potential navigation technologies, which are capable to add the global navigation satellite systems and in common to provide reliable determination of coordinates of the place, a vector of the movement of the vessel and the exact time for needs of navigation.

The nature of activity of the sea industry constantly changes – there is a requirement of knowledge and competence. Educational institutions are obliged to improve training programs.

The training purpose – to give to youth an opportunity to learn the different fields of the sea industry, to find suitable work. Now days, there is no only navigation technology capable to provide reliability, stability, accuracy, availability of navigation information under any conditions. Therefore, the future of sea navigation consists in complex use of several sources of navigation information. It is necessary to pay special attention to a human factor and the restrictions connected with the existing and created navigation technologies, such as loss of signals from the global navigation satellite systems.

**Keywords:** Tendencies of Sea Development, debatable problems of sea navigation, global navigation systems, to improve training programs;

Each state of the region, even the smallest, has to plan the investments into sea space, coordinating it with neighbors. It is difficult. The level of development and competitiveness of the countries which are around the sea differs. Globalization, telecommunication revolution, formation of educated society, political compromises have directed investments to the new economic centers. The countries of Asia, South America having the cheap labor suitable for mass production with the youth striving for knowledge became a competitive call for Europe.

In Georgia, the infrastructure intensively extends – cables, pipelines are laid, parks of energy, grow the coastal cities. The destiny depends also on whether we will manage to keep harmony with the nature. Not differing in natural and energy resources, it is necessary to learn to turn results of scientific research into a product and to sell it. A guarantor of

success are educated people. It is considered that we have too many people with the higher education.

**Tendencies of sea development of the region** the Nature of activity of the sea industry constantly changes – there is a requirement of knowledge and competence. Educational institutions are obliged to improve training programs. The academic public attracts partners from the sea industry and business. Try to predict possibilities of development of separate sectors, the need for experts, to define amount of knowledge, abilities necessary for them and competence. Training on receiving degree of the bachelor lasts four years, on the master's degree – from 1,5 to 2 years. Professionals join the labor market too slowly. It is possible to update knowledge due to training at courses much quicker. They are shorter, various, intended for motivated people, besides various methods of training are applied, professionals work for them. It is better to adapt in labor market precisians, meetings with employers help. The young man has to use possibilities of practice at the Lithuanian and international enterprises.

**The purpose** – the marine sector of the countries in training of specialists of new generation taking into account needs of employers. The young people seeking for different education in sea area or already having it participate in actions of projects. Necessary abilities in the marine sector with the offer of training programs are coordinated with the countries of partners of the project.

The shipbuilding and ship repair, the ship equipment, power of sea wind, investigation and operation of a seabed, hydras engineering, fishery, logistics, safety of sea segments and management of crisis have always been noted as perspective areas which will need further qualified specialists.

On the basis of researches the training program which includes intensive courses, the practician at the enterprises, in research establishments is made. The training purpose – to give to youth an opportunity to learn the different fields of the sea industry, to find suitable work. On courses it is important to be able to combine different interests to achieve results, favorable and useful to all, keeping the pure and safe marine environment.

Ecological initiatives for navigation, technologies for collecting the broken oil products are analyzed, consider what impact on navigation will be exerted by restrictions of air pollution from courts, to improve practical skills, to improve knowledge of a foreign language, to learn culture and traditions of other countries.

**The purpose** - urgent and debatable problems of sea navigation, consists in a research of various navigation technologies. It is necessary to mark out those potential navigation technologies which are capable to add the global navigation satellite systems and in common to provide reliable determination of coordinates of the place, a vector of the movement of the vessel and the exact time for needs of navigation. Business and researchers have to propose possible solutions in common. in the course of discussion.

It is possible to mark out the most interesting results:

- Navigation is in a condition of search of answers to new calls of navigable business, connected with growth of quantity and the sizes of courts, transition to mass construction of artificial constructions to the sea that narrows space for maneuvering of courts and intensifies navigable streams.
- Technology solutions for providing the solution of objectives have to be defined by real needs of marine engineers , the maximum accounting of human factors during creation of the navigation equipment (we use as the examples standardization of the EKNIS format, realization of the principle of the S-mode which have got broad support of seamen, but insufficiently reflected in the principles of e-navigation).
- Training of seamen has to combine still training in traditional sea receptions which improvement has to continue during all career of the marine engineers. It is necessary to pay special attention to a human factor and the restrictions connected with the existing and created navigation technologies, such as loss of signals from the global navigation satellite systems.
- Nowadays, there is no only navigation technology capable to provide reliability, stability, accuracy, availability of navigation information under any conditions. Therefore, the future of sea navigation consists in complex use of several sources of navigation information.
- It is offered to study a new navigation paradigm which emergence is possible in the nearest future: the inertial navigation system becomes the main source navigation parameters of a moving object, and other sensors (including GNSS) provide drift compensation.
- A variety of navigation equipment results in need of carrying out preparation on use of the concrete equipment (for example, 38 EKNIS various types are made). Increase in level of standardization and the corresponding reduction of specific preparation is capable to increase safety of navigation of the vessel and to reduce preparation volume at development of new technologies.

- Many sectors of transport already apply deserted (pilotless) technologies (the motor transport, aircraft). Innovations on pilotless navigation are capable to lead to serious changes in navigation, even in the presence of crew onboard the vessel, however process develops not quickly and so far finds insignificant support. It is offered to draw the attention of sea community to need of development for this direction.

- Many sea systems, including navigation systems, are subject to cyber-attacks. Even such conventional systems as EKNIS, are connected to many sensors and system of the vessel and the bridge of the vessel, using intra ship network and, even, the Internet and e-mail, without possessing sufficient protection against viruses and external massive threats.

So , It is necessary to mark out those potential navigation technologies which are capable to add the global navigation satellite systems and in common to provide reliable determination of coordinates of the place, a vector of the movement of the vessel and the exact time for needs of navigation. Business and researchers have to propose possible solutions in common.

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