

OPTIMIZATION OF MANAGEMENT PROCESSES FOR MARITIME TRANSPORT PERSONNEL QUALIFICATION

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***Abstract.** This study examines the necessity of developing an automated system for managing qualification parameters of organizational-technical systems in maritime transport, with the aim of enhancing the quality of training and professional activities of ship operators. This could lead to reduced personnel training costs, decreased risk of navigational accidents.*

Introduction. The growth of global trade and the demands for efficiency and safety in maritime transport highlight the need for continuous improvement in the technological process of ship management. One of the key factors affecting the effectiveness of maritime transport is the qualification of personnel, particularly ship operators. Considering modern trends in automation and the development of information technologies, the creation of an automated system for managing qualification parameters of organizational-technical systems (OTS) in maritime transport can contribute to the enhancement of the quality of training and professional activities of ship operators, which is an important task for the industry.

Problem Statement. The issue lies in the necessity to develop an automated system for managing qualification parameters of OTS in maritime transport. Given current challenges, such as increased competition, changes in environmental and safety requirements [1,2], and the complexity of managing qualification parameters, this issue becomes relevant and important. The research aims to study the theoretical foundations of modeling and managing qualification parameters, develop an automated multi-level management system, conduct experimental research and verification of the developed system, and develop recommendations for its implementation and use.

Main Part and Essence of the Study. To ensure scientific objectivity and relevance of conducting research on the automated system for managing qualification parameters of OTS in maritime transport, it is necessary to perform a series of key stages. Starting with the analysis of the current state of the problem, which helps to obtain a comprehensive understanding of existing methods, technologies, and problematic aspects, new approaches can be identified, and the management system can be improved. Studying organizational-technical systems of maritime transport provides an understanding of the structure, functions, and classification of systems, as well as requirements for personnel qualifications, creating prerequisites for the development of an adequate automated system. Next, studying methods of identification of qualification parameters of OTS subjects allows considering various aspects and factors affecting ship operators' qualifications and developing optimal methods. Developing models for dynamic formation of OTS qualification parameters contributes to reflecting changes in qualification parameters over time and developing methods for predicting future personnel qualification needs. Finally, researching theoretical aspects of fuzzy identification systems under uncertainty involves studying the basic concepts and principles of fuzzy logic, which can provide more accurate modeling and analysis of dynamic formation processes of OTS qualification parameters, taking into account uncertainty and instability of factors affecting these processes.

Accomplishing the set tasks ensures a systematic approach to the development of an automated multi-level system for managing qualification parameters of OTS and its integration with existing maritime transport systems. In turn, designing the system's architecture, determining its structure, management levels, and interaction mechanisms form the basis for further system development, requiring a thorough approach. Next, during the development of models and methods of information support, the system should provide data collection, processing, and analysis of

personnel qualification parameters, facilitating decision-making to improve maritime transport efficiency. Additionally, developing intelligent support algorithms, modern artificial intelligence methods, machine learning, and optimization will enable creating effective management strategies, forecasting, and system adaptation to changing conditions and requirements. Moreover, assessment and control of management object parameters, developed methods and criteria for evaluating system efficiency and reliability, as well as control and adjustment mechanisms, ensure the system's compliance with the expected quality and reliability levels.

Of course, integrating the automated system for managing qualification parameters of OTS with existing information and management systems of maritime transport involves developing and implementing interfaces and interaction protocols. This allows for data exchange, coordination of actions, and shared use of resources between different systems and subsystems, contributing to increased efficiency and flexibility in managing the qualification parameters of maritime transport personnel.

The next task involves selecting methods and tools for experimental research; researchers must thoroughly describe methods and instruments such as computer modeling, reinforcement learning, machine learning, and others. This allows for determining optimal approaches for conducting experiments and their analysis. It is also necessary to ensure data formation for experimental research; researchers should identify data collection, processing, and analysis processes. It is important to consider data structure, sources, and their reliability, enabling the acquisition of quality information for conducting experiments.

Ultimately, the experimental verification of the effectiveness of decision-support intelligent algorithms involves analyzing experimental results, comparing developed algorithms with existing methods, and identifying algorithm limitations and possible directions for their improvement. This helps to discover the most effective approaches and ensures the developed system's compliance with industry requirements.

Verification of the developed automated system for managing OTS qualification parameters based on comparison with alternative methods requires conducting a comparative analysis of the system with alternative methods, considering their effectiveness, implementation complexity, and cost. Such analysis will reveal the advantages and disadvantages of the developed system compared to other available solutions and determine opportunities for its optimization and improvement.

Thus, each research stage plays a crucial role in implementing an automated system for managing OTS qualification parameters. They are interconnected with logical transitions that ensure a consistent and integrated approach to system development and implementation. Through such a systematic approach, more effective management of maritime transport personnel qualification parameters can be achieved, ensuring an adequate response to challenges and changes arising in the industry.

Conclusion. Considering the aspects described above will contribute to the successful preparation and implementation of the research, which may lead to the creation of an effective automated system for managing the qualification parameters of maritime transport OTS. The result of such research could be a system that improves the work of navigators and increases the competitiveness of maritime transport on a global level. The implementation of such a system will lead to significant economic and social advantages, including reduced personnel training costs, reduced risk of navigational accidents, improved maritime safety, and environmental stability.

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