DOI https://doi.org/10.30525/978-9934-26-340-8-16

PREREQUISITES THE FORMATION OF A LOGISTICS SYSTEM FOR THE REPAIR OF PARTS OF THE «SHAFT» TYPE OF SHIP TECHNICAL FACILITIES

ПЕРЕДУМОВИ ФОРМУВАННЯ ЛОГІСТИЧНОЇ СИСТЕМИ РЕМОНТУ ДЕТАЛЕЙ ТИПУ «ВАЛ» СУДНОВИХ ТЕХНІЧНИХ ЗАСОБІВ

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The modern concept of logistics management considers all types of material and information flows as a single entity.

The uniqueness of logistics approaches lies in the integration of these flows, which can be interconnected at different stages of production activity. The main principles of logistics are: systematicity, complexity, scientificity, concreteness, constructiveness, reliability, variability, integrability, efficiency, flexibility, integrity, preventiveness.

Repair technologies for restoring and increasing the resource of «shaft» type parts of ship machinery are closely related to the organization, management and control of the movement of material and information flows in space and time.

The fundamental difference between the logistic approach to the management of material and information flows of the repair process from the traditional one lies in the allocation of a single function of managing, first of all, separate material and information flows: in the technical, technological, economic and methodological integration of individual links of the repair process into a single system that ensures effective management of material and information flows [1; 2].

The novelty of the logistics approach is an organic mutual connection, the integration of the above-mentioned areas into a single materially and informationally leading system. In other words, the goal of the logistics approach is end-to-end management of material and information flows [3].

Therefore, it is advisable to solve the task of developing a repair technology in a complex with the tasks of increasing the resource and reliability of equipment on the basis of the principles of logistics, which allow to minimize and optimize costs in production [4].

Regarding repair production, the functional aspect of N consists of all types of production preparation $N_{prep.}$ and production processes directly $N_{prod.}$:

$$N = \left\{ N_{prep} + N_{prod} \right\},$$

In turn, types of N_{prep} production preparation include the following processes: $N_{під} = \left\{ N_{dtd} + N_{ddd} + N_{tpd} + N_{spt} + N_{dsm} \right\},$

N_{dtd} – development of technical documentation; N_{ddd} – development of design documentation; N_{tpd} – technological process development; N_{spt} – selection and placement of equipment according to the technological process; N_{dcm} – determination of control methods.

The resource aspect P includes material resources P_m, informational resources R_i, financial R_f and labor R_l:

$$P = \left\{ P_m + P_i + P_f + P_l \right\}$$

Each individual element of these sets is characterized by a specific state.

The repair strategy must logistically link these flows of elements at different stages of production and subordinate them to common goals.

The main elements of material flow in ship repair production are: repair objects, technological equipment, materials, component products, energy carriers. Material, financial, personnel flows are accompanied by information that can manage them. Therefore, a decisive factor in the implementation of logistics operations is information that acts as a production factor and its integration with material flows at all levels of repair and operation.

The functional aspect of repair production determines the inclusion in the composition of the goals of the general strategy of restoration of "shaft" type parts to ensure production preparation [5]. When forming the logistics system of repair, the availability and location of production units, personnel training, technical documentation, design documentation, environmental friendliness of production, information system, etc. should be taken into account.

Fleet maintenance is perceived as a logistics system consisting of two subsystems: macro-logistics (operation period) and micro-logistics (repair period). Factors related to operating conditions and even maintenance and

service life of repair objects affect technical decision-making during selection of a strategy for repairing ship parts of the «shaft» type [6].

The task of the logistic approach is to optimize the total costs of repair and operation of the repair object, therefore, the basis of the development of a strategy for the restoration of parts is integral goal setting based on system analysis.

The enlarged algorithm for forming the logistical structure of the repair is shown in Fig. 1. In terms of tasks, technical solutions contain appropriate technological methods and means for their implementation [7]. They include various ways and methods of restoration, processing, strengthening, and are multivariate.

A systematic approach to the implementation of shaft-type ship parts and a logistics management strategy based on the analysis of a separate share of the entire logistics system are implemented by moving to achieve private goals of other elements of the repair logistics system. Providing a logistics approach to developing a repair strategy before completing the upcoming tasks:

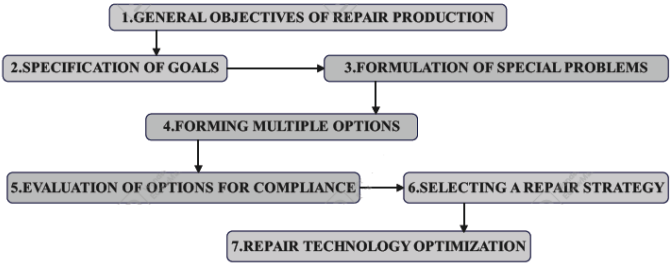

Fig. 1. Consolidated algorithm for the formation of the logistical structure of the repair

– finding the optimal combination of setting goals and finding their optimal combination;

– determination of the ways and means of achieving these goals through the identification of connections and the study of the interaction of the factors taken into account and the analysed objects by means of modelling and forecasting of processes related to the movement of elements of various flows in repair production;

– interconnection of goals and means of their achievement with the need for resources, taking into account the limitations of the latter;

– analysis and evaluation of the obtained results;

– choice and decision-making.

Thus, the adoption of strategic decisions is a complex multi-stage procedure, the implementation of which requires information about the goals of the activity, the means to achieve them. To implement the concept of logistics management in the repair industry, which is characterized by a significant degree of uncertainty, additional information is required (including on the operation of products), i.e. expansion of information flows. Based on these flows, it is possible to search for additional alternative solutions for the restoration of large parts. This requires the solution of various computational and optimization problems using mathematical methods, the application of which is possible on the basis of repair modelling.

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