Наразі альтернативні маршрути включають транзит через Чорне море територіальними водами в Румунії та через порт Констанца, відправлення річкою Дунай і залізничним сполученням через Республіку Молдова. Ці альтернативні варіанти вочевидь призвели до зростання транспортних витрат та сприяють продовженню змін у моделях торгівлі зерном.

Такі зміни добре ілюструється прикладом африканських країн. Імпорт зерна з України має вирішальне значення для продовольчої безпеки багатьох країн регіону. Зниження імпорту майже на 15% з України у 2022 р. змусило ці економіки адаптувати свої моделі імпортних поставок до вимог ситуації, що склалась. Єгипет, наприклад, впорався з падінням пшениці на 81% імпорту з України протягом перших восьми місяців війни шляхом заміни джерела імпорту на Сполучені Штати та Європейський Союз; Ефіопія замінила втрату поставок пшениці з Російської Федерації та України з поставками з США та Аргентини [2].

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IMPROVEMENT OF THE ORGANIZATION OF RAILWAY TRANSPORTATION OF GRAIN CARGO

УДОСКОНАЛЕННЯ ОРГАНІЗАЦІЇ ЗАЛІЗНИЧНИХ ПЕРЕВЕЗЕНЬ ЗЕРНОВИХ ВАНТАЖІВ

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The development of the Ukrainian economy depends on the ability of enterprises to compete on the international market. One of the key products offered by the economy of Ukraine today is grain cargo. The grain industry is the basis and source of sustainable development of the country's agricultural sector and agricultural exports. At the moment, rail transport is considered the most popular option for grain transportation, the use of which allows you to optimize costs per ton of transported cargo. It is obvious that the transportation of grain cargoes is one of the promising and profitable transportations for JSC "Ukrzaliznytsia". In this context, an important task is the development of the railway transport system in order to ensure the necessary capacity for the transportation of grain cargoes with the minimization of costs.

Studies of the dynamics of the volume of transportation of grain cargoes over the last 10 years before the start of the war showed that there is a tendency for this indicator to increase. Therefore, the conditions of modern development require carriers to create an optimal environment for transportation with the achievement of the best quality indicators. The most important thing for improving the organization of transportation of grain cargoes is the effective and rational use of technical and transport means at cargo stations in connection with producers. Car turnover for this type of cargo is one of the key quality indicators of work in modern conditions. Since waiting for the formation of a route or a wagon shipment at the elevator has the greatest influence on the circulation of grain wagons, this issue requires a comprehensive, rational solution.

JSC "Ukrzaliznytsia" most often uses routes for the delivery of grain cargoes. Route delivery of grain means that the entire volume of a grain batch is immediately fed to one elevator, loaded into wagons and delivered to a specific destination without any obstacles, avoiding unnecessary stops on the way to reform the composition. This method makes it possible to reduce the turnover of wagons in motion both in the loaded and in the empty state. In general, routing significantly increases the volume of transportation of grain crops. However, not all existing elevators are able to use the route system and load full trains during the day. For such elevators, it is necessary to apply another technology, which involves their ability to form stepped routes with different enterprises [1]. This process involves the formation of routes that connect several elevators and railway stations and are directed to one specific destination. The creation of such staggered routes helps to optimize rail transportation of grain and reduce the risk of receiving losses due to late delivery of cargo.

In modern conditions, the formation of a model is relevant, which will allow to optimize the process of formation and following of a stepped route with grain to the destination. The objective function of the model can be stated as the sum of the reduced costs associated with the processes of feeding and cleaning wagons, loading wagons, forming a step route, moving wagons to the formation station and to the port or border with other countries, as well as storing grain cargoes while waiting unloading at the port or transshipment operation at the border station. To ensure the efficiency of the transportation process, it is necessary to take into account certain factors that affect this process and can complicate it [2]. Therefore, it is proposed to include in the model the costs associated with the probability of various complications in the transport process and failures of technical means during the formation and movement of the route train. In the future, this will allow senders, carriers and receivers to effectively manage all information and schedule the shipment and delivery of grain cargoes, taking into account certain limitations, technical capabilities of stations and elevators. The use of the proposed technology will contribute to the optimization of rail transportation of grain cargoes, taking into account certain obstacles at various stages of the transportation process, reducing non-productive stoppages of wagons and reducing their circulation.

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INCREASING THE EFFICIENCY OF THE BORDER STATION BASED ON THE USE OF THE LOGISTICS INFRASTRUCTURE FACILITY

ПІДВИЩЕННЯ ЕФЕКТИВНОСТІ РОБОТИ ПРИКОРДОННОЇ СТАНЦІЇ НА ОСНОВІ ВИКОРИСТАННЯ ОБ'ЄКТУ ЛОГІСТИЧНОЇ ІНФРАСТРУКТУРИ

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In the conditions of the war and existing difficulties with international transportation, the railway remains the most stable, reliable and affordable mode of transport today. After the blocking of the ports, export-import transportation of goods takes place to a large extent through the European countries with which Ukraine borders, where border stations play a key role. Export transportation in this direction amounted to about 34 million tons in 2022, which is 10 million tons more than in 2021. For example, the capacity of railway border crossings between Ukraine and Poland is from 150 (Mostyska-2 – Medyka stations) up to 600 wagons per day (Izov – Hrubeshuv stations). Today, the issues of increasing the volume of transportation through border stations are being actively worked out, which should ensure the unhindered passage of railcar traffic thanks to the availability of rational technology for processing export-import railcar traffic, the transfer of goods from one country to another.

Against the background of limited throughput and processing capabilities of the border stations of Ukraine and neighboring countries, difficulties in processing growing cargo flows were revealed. Currently, there are queues of wagons for transfer to foreign carriers and restrictions on cargo transportation. In different periods, the queue for them can reach 8-16 days. That is, there are unproductive downtimes of wagons, which lead to an increase in their circulation, failure to meet the deadline for the delivery of goods and an increase in operating costs. Also, cargo transportation in international traffic is carried out unevenly. As a result of the non-agreed delivery of loaded wagons to the border stations on the 1520 mm track, the