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AUTOMATION OF TRANSPORT PROCESS OF INDUSTRIAL ENTERPRISE

АВТОМАТИЗАЦІЯ У СФЕРІ ДИСПЕТЧЕРСЬКОГО УПРАВЛІННЯ МАТЕРІАЛЬНИМИ ПОТОКАМИ ПРОМИСЛОВОГО ПІДПРИЄМСТВА

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Анотація. *У роботі розглянуто питання забезпечення ефективності функціонування залізничного транспорту підприємств, важливу роль у їх реалізації відіграє інтенсивне та збалансоване використання його потенціалу як основи, на якій будуються та реалізуються зовнішні та внутрішні відтворювальні процеси. У зв'язку з цим актуалізується необхідність формування багаторівневої системи управління розвитком залізничного транспорту промислового підприємства, яка повинна ґрунтуватися на раціональному використанні та побудові взаємозв'язків між різними видами та рівнями напрямів діяльності, ієрархії управління, сферами функціональної відповідальності, ресурсами.*

Ключові слова: *залізничний транспорт підприємств, диспетчеризація, логістичне управління, автоматизована система управління, перевізний процес, інформація, менеджмент підприємства, вагони, шляхи підприємства*

Abstract. *he work examines the issues of ensuring the efficiency of the functioning of railway transport of enterprises; an important role in their implementation is played by the intensive and balanced use of its potential as the basis on which external and internal reproductive processes are built and implemented. In this regard, the need to form a multi-level management system for the development of railway transport at an industrial enterprise is becoming urgent, which should be based on the rational use and construction of relationships between different types and levels of activities, management hierarchy, areas of functional responsibility, and resources.*

Key words: *railway transport of enterprises, dispatching, logistics management, automated control system, transportation process, information, enterprise management, wagons, enterprise routes*

Introduction.

An important role in achieving the sustainable development of a modern enterprise is played by the intensive and balanced use of its potential as the basis on which external and internal production processes are built and implemented. In this regard, the need to form a multi-level management system for the development of railway transport of an industrial enterprise is actualized, which should be based on the rational use and construction of relationships between different types and levels of activities, management hierarchy, areas of functional responsibility, resources.

The main sign of the sustainable state of the railway transport of an industrial enterprise is its development. Development is the process of improving certain elements of material systems as a whole, the transition to fundamentally new qualitative characteristics.

Main text In this sense, development should be understood as a multidimensional process of deep modernization and reorientation of the entire economic and social system. It implies the growth of income from production and transportation, the implementation of radical changes in the institutional, social and administrative structures.

Solving the problems associated with ensuring the efficiency of the functioning of the railway transport of enterprises, the definition of modern methods of managing the development of railway transport is given attention by many domestic scientists. Among them are the works of Dikan [1], L.L. Kalinichenko [2], N.V. Yakimenko [5] and others.

The technology of cargo flows logistics management is based on the principle of dispatching, using a complex of interconnected information and management automated systems and technologies.

The ACS Transport of an industrial enterprise is geared to technological-process automation of the railway stations operation (for example, there are up to 20 stations at an iron and steel plant) related to organization and planning, as well as the timely provision of information to personnel for operational management and analysis of the transportation process [4].

An automated system is a set of interconnected workplaces, united by a single reference data, interconnected both in technical and informational relations with each other and with the interacting levels ACS. The sphere of the ACS Transport functioning is all stations of the enterprise and their subdivisions related to the goods transportation and the wagons transfer between the enterprise stations and the main railway line.

Automation represents the collection, processing, accumulation of information and display of information models of controlled technological processes [3, 6].

Remote control and monitoring of all processes by responsible persons is carried out through a web server. Access to the server and interface is limited by user rights and protected by SSL encryption. The server stores all information on operations and processes recorded in the system, and also synchronizes directories of contractors and cargoes. Each operation is associated with data on the number of the vehicle, its passage of the route, the time of entry / exit, the weight of the cargo, photos and videos of the processes of weighing and identification. Reports are generated and printed directly according to all the necessary parameters. The operation of this system allows to reduce the cost of production and logistics costs, and also increases the efficiency of all responsible departments of industrial enterprises. The management of the enterprise as a result of the implementation of ACS of transport receives reliable data from all technological areas in real time and can view reports in any convenient format. With the help of the system, control over compliance with the specified production modes and product quality is carried out, and it also receives a high throughput of technological sections and the uninterrupted operation of the

points of shipment of finished products and the acceptance of raw materials.

ACS Transport allows to provide: reliable information about transported goods, accounting for the loaded and empty wagons use on the enterprise approach line, the possibility of calculating and analysing the technological operations time, issuing cargo weight mismatches according to information from the scales and from the full-scale sheet, the possibility of tracing and wagons on the enterprise approach line, calculation of transport technical and economic indicators.

The ACS system covers the following workplaces: the operator of the station technology center for processing arriving trains; the operator of the station technology center for the processing of dispatched trains; shunting station dispatcher; the person on duty on the hill; information station; commodity cashier; acceptance/delivery agent; system technologist; the head.

Thus, the entire operation sequence for the arriving trains processing is carried out using of modern information technologies, and includes: the train arrival at the crossrail station; writing off a wagon list; acceptance operations with wagons in a commercial and technical aspect; the formation of transportation documents (destination station codes, cargo front codes and cargo codes that are in the directory are entered into the system); printout of cargo documents for the possibility of sending a train to the production departments; shunting operations and delivery along cargo fronts [7].

Conclusions.

Information about the time spent by the particular wagon on the industrial enterprise tracks, obtained as a result of the Transport Automated Control System work, makes it possible to make a decision about transfer the wagon for delivery to the external network or for the next cargo operation. This makes it possible to minimize the enterprise costs for the usage of wagons, which is of particularly true in the period of the volatile economic situation. The considered system makes it possible to keep track the entire processing sequence with the wagon and the time spent on them from the moment it arrives from the external network on the enterprise railway and to its delivery to the external network.

Література:

1. Дикань В.Л. Забезпечення конкурентоспроможності промислових підприємств в умовах функціонування мережі міжнародних транспортних коридорів / В.Л. Дикань, М.В. Корінь // Вісник економіки транспорту і промисловості. – 2012. – № 38. – С. 156 – 162.

2. Калініченко, Л. Л. Методологічний підхід до управління персоналом підприємств залізничного транспорту в умовах реформування галузі: монографія / Л.Л. Калініченко. – Х.: УкрДАЗТ, 2012. – 420 с.

3. Трегуб, В. К. Проектування систем автоматизації: навчальний посібник. – Київ: Ліра, 2014.– 344 с.

4. Федоров, Ю. Н. Порядок создания, модернизации и сопровождения АСУТП. – М.: Инфра-Инженерия, 2011. – 576 с.

5. Якименко, Н. В. Системно-структурний підхід до формування інституційного середовища залізничного транспорту / Н.В. Якименко // Вісник

економіки транспорту і промисловості. – 2012. – № 39. – С. 190 – 198.

6. Хара, М. В. Вплив цифрових технологій на управління ланцюгами поставок / М. В. Хара // Digitalization of the economy as a factor of sustainable development : materials of International scientific-practical conference (Mariupol, May 25–26, 2021 y.) / SHEI «PSTU». – Mariupol, 2021. – P. 88–89.

7. Ligum, U. S. Development of algorithm and control of technological processes of transport in real time // International Transport. – Berlin, 2000. – P. 402–410.