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Adaptation of Ukrainian Grain Elevators for Unit Train Loading

Dmytro Kozachenko^a, Volodymyr Bobrovsky^a, Oleksandr Ochkasov^{a*},
Anatolii Shepotenko^a, Yuliia Hermaniuk^a

^a*Dnipropetrovsk National University of Railway Transport named after Academician V. Lazaryan, 2 Lazarian St., 49010 Dnipro, Ukraine*

Abstract

The aim of the paper is to improve approaches to the design and operation of private sidings of grain elevators for loading of unit trains. The research is based on the methods of organizing of railway operation. One of the main methods of reducing costs in the logistics chain, which provides for the export of grain cargoes is the using of unit train technology for transportation. Introduction of this technology in Ukraine is limited by the low loading capacity of elevators. In the paper the basic schemes of track development of elevator private sidings and analyzes the use of different technical means for performing shunting operations are presented. The results of the performed research can be used for designing and reconstruction of the existing elevators and for building the new ones, as well as for estimating the costs associated with different logistic schemes for grain delivery to seaports. As result the work develops a methodology and obtains a technical-operational assessment of the technical equipment and the operation technology grain elevator private sidings for loading of unit trains.

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1. Introduction

Today, grain is one of the main export goods of the Ukrainian economy. In the 2016/2017 marketing year, Ukraine has exported 43.9 million tons of grain. This is the second result in the world after the United States (92 million tons.) and in monetary terms it is about 17 % of the country's total exports and. Lowering the logistics costs is one of the problems that needs to be solved in order to increase the competitiveness of Ukrainian grain in foreign

* Corresponding author. Tel.: +380677452071

E-mail address: abochkasov@gmail.com

up to the station. At the stations serviced by diesel traction shunting operations for cars moving at the elevator tracks can be performed by the locomotives TGM23 or locotracors with the supply and picking up of cars by the railway locomotive. One can also use the schemes of track development, which allow placing cars at the loading tracks for one supply by train diesel locomotive. The necessary additional capital investments in the development of grain elevator for unit train loading at intermediate station will be 330–530 thousand USD.

References

- [1] Feidengold VB., Serebryany VL., Belecky SL. Technological design and efficient operation of the lines of acceptance and delivery of grain to the wagons at the elevators of the Rosrezerva. *Innovative technologies of production and storage of material values for state needs* 2015, 4: 225–242.
- [2] Kozachenko DM., Korobyova RG., Rustamov RSh. Improvement of technical support and technologies of export transportation of grain cargoes in Ukraine. *Bulletin Dnipropetrovsk State Agrarian University of Economics* 2015, 4: 121–127.
- [3] Berezovy MI. Transportation os steel products circular route schedule with private lokomotive. *East European Journal of advanced technologies* 2014; 3 (68): 51–55.
- [1] Golubeva EV., Zubkov VN., Chebotaryova EA. Logistic technologies of formation of ship parties on the road range. *Bulletin of Rostov State Transport University* 2007, 4 (28): 56–61.
- [5] Kozachenko DM., Ochkasov OB., Shepotenko AP., Sannycky NM. Prospects for the use of private locomotives for the transportation of goods in the direction of sea ports. *Science and progress of transport* 2017, 6 (72): 7–19. DOI : 10.15802/stp2017/118196.
- [2] Kozachenko DM., Zhuravel IL., Levycky IYu. Normalization of the duration of maneuvering movements taking into account the limitation of the speed of movement on individual elements of following of trains. *Railway transport of Ukraine* 2014, 6: 30–36.
- [7] Kolodychuk VA. Efficiency of logistics of grain and products of its processing: monograph. Lviv: Ukrainian bestseller, 2015. 574 p.
- [8] Bodnar B., Ochkasov A., Bobyr D. Improving Operation and Maintenance of Locomotives of Ukrainian Railways. *Technology and Art* 2016, 7: 109–114.
- [3] Standards of technological design of grain reception enterprises and elevators: VNTP-05-88. Moscow: TsNIIPROMZENROPROEKT: Ministry of Bread Products of the USSR, 1988. 139 p.
- [4] Rustamov RSh. Evaluation of the prospects for the development of grain logistics in Ukraine. *Transportation systems and transportation technologies. Dnipropetrovsk*, 2014, 8: 127–133. DOI : <https://doi.org/10.15802/tstt2014/38101>.
- [11] Ndembe E. Hard Red Spring Wheat Marketing: Effects of Increased Shuttle Train Movements on Railroad Pricing in the Northern Plains. *Journal of the Transportation Research Forum* 2015, 54(2): 101–115.
- [12] Vernyhora RV., Rustamov RSh. Analysis of the storage system of Ukrainian grain. *Transportation systems and transportation technologies. Dnipro*, 2017, 13: 10–18. DOI : 10.15802/tstt2017/110763.