

AP14869550 “Developing and studying the design of a stationary elevator for loading grain cargo into containers transported by railway platforms” – p.m. Balabayev O.T.

Relevance

Currently, at agricultural elevators, loading of grain cargo into containers transported by road is carried out by mobile elevators. On rail transport, which is the main mode of transport for the export of Kazakhstan grain crops, loading of grain cargo is carried out through elevator bunkers into grain wagons. In Kazakhstan, the number of grain wagons is limited due to their high cost and the seasonality of harvests. The main idea of the project is that the developed design of a stationary elevator will allow loading of grain cargo through elevator bunkers into containers transported by railway platforms. The implementation of this project will significantly increase the possibilities of exporting Kazakhstani grain crops by rail.

Project goal

Development of a design and study of the operation of a stationary elevator for loading grain cargo into containers transported by railway platforms for further implementation in agricultural production of grain crops.

Results achieved

Design and technical documentation has been developed – a diagram of a stationary lift has been drawn in the AutoCAD application environment: elements of horizontal beams of the load-gripping frame; elements of vertical beams of the load-gripping frame; elements of diagonal beams of the load-gripping frame; elements of connecting nodes of the load-gripping frame.

1 monograph published in foreign publishing house. Circulation: 500 copies.

1 monograph was published in Kazakhstan publishing house. Circulation: 500 copies.

A feasibility study of the research results has been developed. The annual economic effect from the implementation of the developed stationary elevator in elevator conditions is within 9 million tenge.

A license agreement dated 08.10.2024 for the provision of non-exclusive rights to technical documentation was concluded between NPJSC Abylkas Saginov Karaganda Technical University and KazTransPromMash company LLP, which co-financed this project.

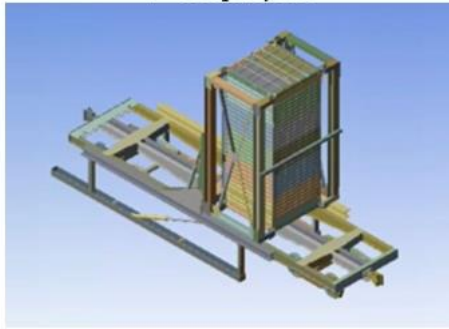
On September 26, 2024, the article was reviewed for publication in the journal «ASEAN Journal of Science and Engineering» with a CiteScore percentile in the Scopus database of 74% (Engineering). Since November 11, 2024, it has been available online on the journal's website - <https://ejournal.upi.edu/index.php/AJSE/article/view/76031>.

Balabayev O., Kassymzhanova A., Marat Ibatov, Mikhailov V., Askarov B. Mathematical Modeling of Static and Dynamic Stresses in the Construction of the Load-Handling Frame of a Stationary Hoist During the Loading of Grain Cargo into Containers: Literature Review and Experiments // ASEAN Journal of Science and Engineering. – 2024. – Vol 4, No 3. DOI: <https://doi.org/10.17509/ajse.v4i3.76031>

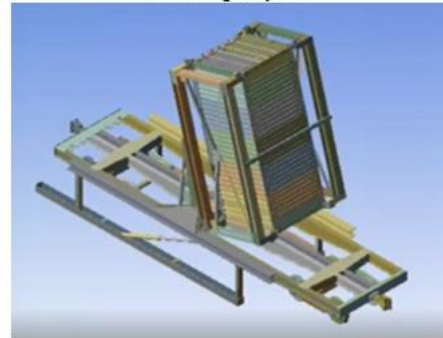
Since September 2024, the article «Mathematical modeling of static and dynamic stresses in the construction of the load-handling frame of a stationary hoist during the loading of grain cargo into containers» by Oyum Balabayev, Aidana Kassymzhanova, Marat Ibatov, Valentin Mikhailov, Bakhtiyar Askarov is under review (Under Review - under consideration) in the journal «Journal of Industrial Integration and Management» with a citescore percentile in the scopus database of 98% (Engineering).

Model of a stationary lift in the software environment of the ANSYS application program for conducting an experiment

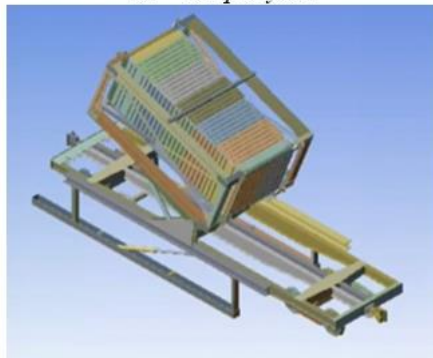
I - 90 градусов



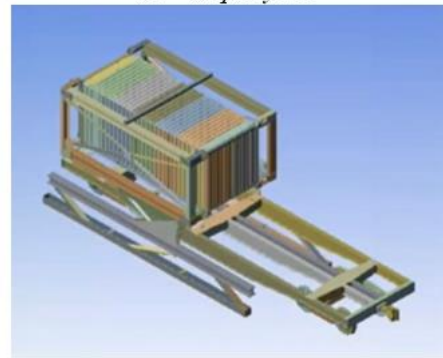
II - 60 градусов



III - 30 градусов

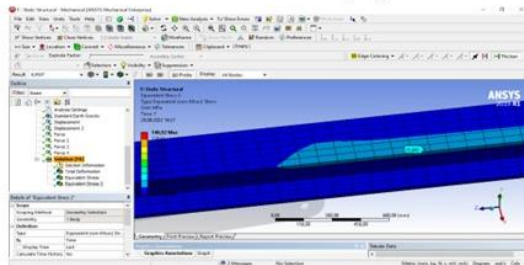


IV - 0 градусов

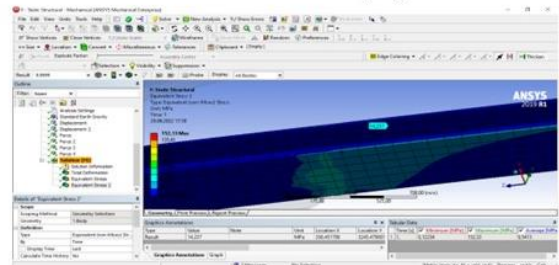


Results of experimental studies of the design of a stationary lift in the software environment of the ANSYS application program

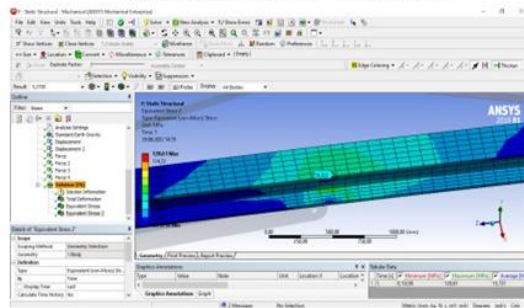
Результаты первого тестового испытания для положения I – 90 градусов



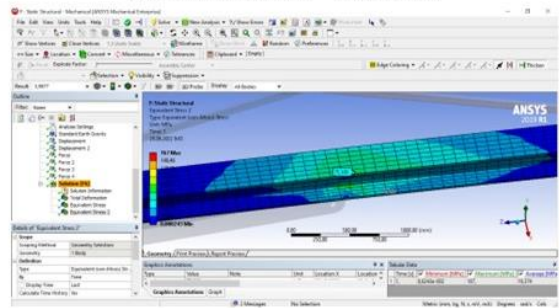
Результаты первого тестового испытания для положения II – 60 градусов



Результаты первого тестового испытания для положения III – 30 градусов



Результаты первого тестового испытания для положения IV – 0 градусов



Research group

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Information for potential users

Analysis of grain exports in the agricultural sector of Kazakhstan has shown that the practical significance of the project is beyond doubt, since the main possible effect of the introduction of a stationary elevator for loading grain cargo into containers transported by railway platforms in agricultural production (elevators) is an increase in the export of grain crops by rail with a shortage of grain cars during the work season. Readiness for commercialization of the expected results of this project will be confirmed by a license agreement from the private partner. with the availability of project financing, the risks are minimized.

Scope of application

The target consumers of the obtained results of the project may be elevators of agricultural productions, carrying out the export of grain crops. During the implementation of the project a breakthrough result is possible, which will significantly affect the development of science and technology in the field of application of lifting and transport equipment in railway transport.

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