

# Scientific papers of the department of «Industrial transport»

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## Department of Industrial Transport

### **Department of «Industrial Transport» Scientific work and innovative projects of the Department of «Industrial Transport»**

Key results of the scientific work carried out by the department over the academic year and their implementation in the educational process and training of scientific and pedagogical staff:

#### **1.1 Completed scientific works of initiative research projects**

**Project Title:** AP14869550 Development and Study of the Design of a Stationary Lift for Loading Grain Cargo into Containers Transported by Railway Platforms.

**Basis for Execution:** Grant funding for scientific and/or scientific-technical projects for 2022-2024 (Ministry of Education and Science of the Republic of Kazakhstan).

**Scientific Supervisor:** Balabaev O.T., Ph.D. in Engineering, Acting Professor.

**Key Results:** An experiment was conducted on a stationary lift using the ANSYS application software environment. The main design parameters of the stationary lift were selected based on experimental studies.

#### **For this topic:**

- A patent was received in Kazakhstan for the developed design of the stationary lift.
- 1 monograph was published by an international publisher:

Balabaev O.T. Development and Study of the Design of a Stationary Lift for Loading Grain Cargo into Containers on Railway Platforms. Approved by the Academic Council of Tashkent State Transport University (Protocol No. 7, dated 03.02.2024), 100 pages.



## 1.2 Results of Scientific Work within the Framework of the Corporate University

1. On March 14, 2024, a meeting was held with the leaders and specialists of "Kaztransprommash" LLP, Karaganda.

1) Preparation and publication of articles and abstracts in co-authorship with enterprise employees (speakers: from KSTU – Suleev B.D., Acting Director of the Department of Science and Innovation; from "Kaztransprommash" LLP – Dyugai O.N., Deputy Director of "Kaztransprommash" LLP).

2) Research practice of master's students (speakers: from KSTU – Balabaev O.T., Ph.D. in Engineering, Acting Professor of the Industrial Transport Department at KSTU, from "Kaztransprommash" LLP – Dyugai O.N., Deputy Director of "Kaztransprommash" LLP).

3) Career orientation work (speakers: from KSTU – Kosbarmakov S.Zh., Master of Science, Senior Lecturer at the Industrial Transport Department; from "Kaztransprommash" LLP – Dyugai O.N., Deputy Director of "Kaztransprommash" LLP).

4) Updating of the educational program (speakers: from KSTU – Askharov B.Sh., Head of the Industrial Transport Department; from "Kaztransprommash" LLP – Guly S.V., Chief Engineer of "Kaztransprommash" LLP).

2. On March 15, 2024, a meeting was held with the leaders and specialists of the KPTU UD of JSC "Qarmet", Karaganda.

1) Discussion of the conclusion of economic agreements, participation in research and development competitions (speakers: from KSTU – Isagulov A.Z., Executive Director of KSTU named after Abylkhaz Saginov; Balabaev O.T., Ph.D. in Engineering, Acting Professor of the Industrial Transport Department at KSTU; Rozhkov A.V., Ph.D. in Engineering, Acting Associate Professor of the Industrial Transport Department at KSTU; from KPTU UD of JSC "Qarmet" – Manuylenco A.N., Head of KPTU UD of JSC "Qarmet").

2) Preparation and publication of articles and abstracts in co-authorship with employees of the enterprises involved in R&D (speakers: from KSTU – Rozhkov A.V., Ph.D. in Engineering, Acting Associate Professor of the Industrial Transport Department at KSTU; from KPTU UD of JSC "Qarmet" – Manuylenco A.N., Head of KPTU UD of JSC "Qarmet").

3) Production and pre-graduation practice of students (speakers: from KSTU – Askharov B.Sh., Ph.D., Head of the Industrial Transport Department; from KPTU UD of JSC "Qarmet" – Manuylenko A.N., Head of KPTU UD of JSC "Qarmet").

4) Career orientation work (speakers: from KSTU – Kosbarmakov S.Zh., Master of Science, Senior Lecturer at the Industrial Transport Department; from KPTU UD of JSC "Qarmet" – Manuylenko A.N., Head of KPTU UD of JSC "Qarmet").

5) Ensuring employment for graduates (speakers: from KSTU – Askharov B.Sh., Ph.D., Head of the Industrial Transport Department; from KPTU UD of JSC "Qarmet" – Manuylenko A.N., Head of KPTU UD of JSC "Qarmet").

6) Updating the educational program (speakers: from KSTU – Balabaev O.T., Ph.D. in Engineering, Acting Professor of the Industrial Transport Department at KSTU; from KPTU UD of JSC "Qarmet" – Manuylenko A.N., Head of KPTU UD of JSC "Qarmet").

### 1.3 Scientific Work with Students

The department operates one student research group under the leadership of Ph.D. in Engineering, Acting Associate Professor Rozhkov A.V., and Ph.D. in Engineering, Acting Professor Balabaev O.T., titled "Industrial Transport". According to the plans of these groups, 12 master's students and 17 undergraduate students are involved in developing dissertation and diploma topics within the "Industrial Transport" department. The following models have been developed: a simulation model of the operation of a railway station with approach tracks, and a simulation model of the operation of a sorting railway station. Master's students and undergraduates are preparing scientific works for participation in annual research competitions, as well as conferences (the Republican Student Scientific Conference of KSTU and the International Scientific and Practical Conference of KSTU – Saginov Readings).

For initiative research topics, 2 doctoral students are also involved. As a result of the scientific research with students and master's students, 36 theses for reports were prepared for the Republican Student Scientific Conference "The Contribution of Youth Science to the Implementation of the Kazakhstan-2050 Strategy," which will be held at KSTU named after A. Saginov on April 11-12, 2024. Additionally, one student work was presented at the Republican competition.

**Certificate of Appreciation:** For active participation in the Republican Student Scientific Conference "The Contribution of Youth Science to the Implementation of the Kazakhstan-2050 Strategy," dedicated to the 125th anniversary of Academician K.I. Satpaev, Part 2, KSTU named after A.Saginov, Karaganda, June 11-12, 2024. Student of group OP-22-1, Kuan F.S. (Scientific supervisor: Atken E., Master of Science, Senior Lecturer of the Industrial Transport Department).

**NIRS** (Scientific Research Competition) in Natural, Technical, Social-Humanitarian, and Economic Sciences. The university-level stage was held on February 21, 2024.

**2nd Place:** Student of group OP-21-2s, Berikbol Madi Omirserikuly, won 2nd place in the first stage of the Republican NIRS competition for the 2023-2024 academic year, held at KSTU "Abylkhas Saginov" in the field of "Organization of Transport, Movement, and Operation". The scientific work was titled: "Forecasting the Main Indicators of Transport in the Karaganda Agglomeration". Scientific Supervisor: Rozhkov A.V., Ph.D. in Engineering, Acting Associate Professor of the Industrial Transport Department.

**1st Place:** Student of group OP-21-2s, Berikbol Madi Omirserikuly, won 1st place in the second stage of the Republican NIRS competition for the 2023-2024 academic year, held at the VKTU "D. Serikpaev" in the field of "Organization of Transport, Movement, and Operation". The scientific work was titled: "Forecasting the Main Indicators of Transport in the Karaganda Agglomeration". Scientific Supervisor: Rozhkov A.V., Ph.D. in Engineering, Acting Associate Professor of the Industrial Transport Department.



The results of the scientific research conducted within the framework of the NIRS are used in the teaching of relevant disciplines and the preparation of course and diploma projects. The department holds annual competitions for the best course and diploma projects based on scientific topics. All diploma works contain a research section, with at least 25% of the diploma topics being of a scientific nature.

The department operates one research group led by Ph.D. in Engineering, Acting Professor of the Industrial Transport Department, Balabaev O.T., focusing on the direction: "Development and Study of the Design of a Stationary Lift for Loading Grain Cargo into Containers Transported by Railway Platforms". The group includes: Askharov B.Sh., PhD, Acting Associate Professor of the Industrial Transport Department; Kasymjanova A.D., PhD, Acting Associate Professor of the Industrial Transport Department; Atken E., Master of Science, Senior Lecturer of the Industrial Transport Department; Maksutova Zh.K., Master of Science, Lecturer of the Industrial Transport Department; Omarova T.Zh., Master, Assistant of the Industrial Transport Department; Kosbarmakov S.Zh., Doctoral Student, group TTD-24-1; Beisembaev D.M., Doctoral Student, group TTD-23-2.

**Result:** Work is underway to develop design and technical documentation for assembling an experimental sample of the stationary lift in the AutoCAD software environment. This includes: Elements of the horizontal beams of the cargo-capture frame; Elements of the vertical beams of the cargo-capture frame; Elements of the diagonal beams of the cargo-capture frame; Elements of the connecting joints of the cargo-capture frame.

#### 1.4 Innovative Projects and Developments of the Department

The Department of "Industrial Transport" is working on the following scientific directions:

1. "Development and Study of the Design of a Stationary Lift for Loading Grain Cargo into Containers on Railway Platforms"
2. "Development and Study of a Device for Securing Brake Shoes"

As a result of scientific work with practical significance in real-world conditions, the department's faculty members, doctoral students, and master's students submit applications for certificates of inclusion in the state register of rights to objects protected by copyright and patents.





### 1.5 Publications in Journals Indexed in Scopus and Recommended by COKSNVO

#### SCOPUS:

1. Moldabayev B.G., Rozhkov A.V., Balabayev O.T. "Determining Basic Geometric Parameters of the Apron Conveyor Drive". Communications - Scientific Letters of the University of Žilina, 2023, 25(3), Pages B201–B208.

2. Balabayev O., Askarov B., Kassymzhanova A., Beisembayev D., Sove A. "Experimental Study of the System 'Source of Exhaust Gas – Storage Capacity'". Communications - Scientific Letters of the University of Žilina, 2024, 26(4), Pages B237–B243.

3. Balabayev O., Askarov B., Bulatov N., Adilova N., Beisembayev D. "Development of Exhaust Gas Insulation System for Quarry Diesel Locomotives". Mechanics Based Design of Structures and Machines, 2024.

#### COKSNVO:

1. Moldabayev B.G., Rozhkov A.V., Askarov B.Sh., Balabayev O.T., Khaibullin R.R. "Justification of the Structural Scheme of a Steep Incline Quarry Apron Conveyor". Kazakhstan, Science and Technology of Kazakhstan, No. 4, 2023.

2. Askarov B.Sh., Balabayev O.T., Rozhkov A.V., Atken E., Kenjekeeva A.R. "Research and Optimization of Wagon Delivery to the Entrance Tracks of the 'Myrza' Station of JSC 'Kazakhstan Temir Zholy'". - Kazakhstan, Proceedings of the University, No. 4, 2023.

3. Akashiev A.Z., Kosbarmakov S.Zh. "Efficiency of Using Transport Vehicles in Open-Cast Mining Operations". - Kazakhstan, Proceedings of the University, No. 4, 2023.

4. Nurkusheva, S.A., Bulatov, N.K., Askarov, B.Sh., Kassymzhanova, A.D., Lyubimov, I.I. "Force Analysis in the Mathematical Model of a Scissor Lift" Kazakhstan, Proceedings of the University, No. 1, 2024.

5. Bekjanova, S.E., Isina, B.M., Kosbarmakov, S.Zh., Maksutova, Zh.K. "Introduction and Updating of Automated Workplaces for Employees of the Karaganda Railway Branch". - Kazakhstan, Proceedings of the University, No. 3, 2024.

6. Atken E., Toktamisov A.B., Kashkimbaev A.M., Imanbaev D.S., Toktamisova A.B. "Analysis of the Development Level of Multimodal Transport in Potential Routes of the 'New Silk Road'". - Kazakhstan, Proceedings of the University, No. 3, 2024.

7. Balabayev O.T., Mikhaylov V.F., Askarov B.Sh., Kassymzhanova A.D., Beisembayev D.M. "3D Simulation Model of Removable Wagon-Platform Equipment (Railway Transporters)". - Science and Technology of Kazakhstan, No. 3, 2024.

## **1.6 Hirsch Index of the Teaching Staff of the "PT" Department (SCOPUS)**

Ph.D., Acting Professor Balabayev Oyum Temirgalievich

Ph.D., Acting Associate Professor Askarov Bakhtiyar Sharapidenovich

Ph.D., Acting Associate Professor Aidana Donenbaikyzy Kassymzhanova