Report on the work of the dissertation Council

Dissertation Council on metallurgy and materials science at the Kazakh national research technical University named after K. Satbayev on specialties (direction of training):

- 6D070700 – «Mining» (8D07203 – «Mining engineering»);
- 6D071100 – «Geodesy» (8D07306 –«Geospatial digital engineering»)

1. Data on the number of meetings held – 9 meeting.

Surnames, first name, patronymic (if any) of the members of the dissertation Council who attended less than half of the meetings: the overwhelming majority of the members of the council attended more than half of the meetings.

2. List of doctoral students indicating the organization of training:

- Ruslan Yegemberdiyev – KazNRTU named after K. Satbayev;
- Baurzhan Orynbayev – KazNRTU named after K. Satbayev;
- Abdikarimova Gulnur Bakhytbekkyzy – KazNRTU named after K. Satbayev;
- Dinara Rakhimbayeva – KazNRTU named after K. Satbayev;
- Nurakynov Serik Maratovich – KazNRTU named after K. Satbayev;
- Urazaliyev Asset Seisenbekovich – KazNRTU named after K. Satbayev;
- Begimzhanova Yerkezhan Yernarkyzy – KazNRTU named after K. Satbayev;
- Aben Ardana Serzhankyzy - KazNRTU named after K. Satbayev;
- Ashimova Ainash Adilhankyzy – KazNRTU named after K. Satbayev.

3. Brief analysis of dissertations considered by the Council during the reporting year

№	Full name of the doctoral student	Topics of work	Code and title of specialty
1	Ruslan Yegemberdiyev	Justification of parameters and development of energy-saving technology for the operation of low-power ore bodies	6D070700 «Mining»
2	Baurzhan Orynbayev	Research for improvement of blasting efficiency with preliminary array softening	8D07203 – "Mining Engineering"
3	Abdikarimova Gulnur Bakhytbekkyzy	Development of scientific and methodological foundations for creating a unified system of geomonitoring of the stress-strain state of the rock mass at the Kachar open-pit mine	D070700 – "Mining Engineering"
4	Dinara Rakhimbayeva	Improving the methodology for I the coastline of the Caspian sea according to the data of remote sensing	6D071100 – «Geodesy»

5	Nurakynov Serik Maratovich	Assessment of the state of mountain cryosphere components using satellite technologies	6D071100 – «Geodesy»
6	Urazaliyev Asset Seisenbekovich	Modernization of local geodetic network of Almaty city with use of satellite and gravity data	6D071100 – «Geodesy»
7	Begimzhanova Yerkezhan Yernarkyzy	Integration of Geospatial Data in the Assessment of Environmental Risk (A Case Study of Industrial Regions of Karaganda Region)	8D07306 – "Geospatial Digital Engineering"
8	Aben Ardana Serzhankyzy	Improving the methodology of 3D reconstruction of overhead power transmission pylons based on geospatial data	6D071100 – «Geodesy»
9	Ashimova Ainash Adilhankyzy	Study of harmony preservation in subsoil development through waste processing	8D07203 – «Mining Engineering»

1 The analysis of the subject of work of – Ruslan Yegemberdiyev «Justification of parameters and development of energy-saving technology for the operation of low-power ore bodies», submitted for the Ph.D in specialty 6D070700 – «Mining».

Dissertation work of a doctoral candidate of KazNTU named after K.I. Satpaeva Ruslan Yegemberdiyev is devoted to the development of energy-saving technology for exploitation of low-power ore bodies as well as the methodology for establishing parameters of drilling and blasting operations when drilling an array of dispersed fans with a special device with an expander, taking into account the dependence of the size of the expanded sections of the cavities of borehole charges, which allows to significantly reduce the volumes of drilling. Determining the values of the speeds of displacement of the medium under the influence of compressive dynamic stresses for each pair of borehole charges in a fan, when establishing the parameters and volumes of the expanded sections of the cavities of blast holes and developing a method for conducting a cutting cavity and drilling parallel conjugate holes with a special device that ensures the passage of cut-off and other raises in one blast from 15 to 30 m. both from the bottom up and from the top down. Based on the work performed, problems related to increasing the percentage of ore extraction and reducing lumpiness were successfully solved, which significantly reduced operating costs not only for loading and haulage equipment, but also for crushing and sorting operations.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 13 scientific articles and reports were published, including: 3 articles - in international scientific journals with Q1 and Q2 quartiles, included in the Scopus database; 2 Patents.

2 The analysis of the subject of work of – Baurzhan Orynbayev « Research for improvement of blasting efficiency with preliminary array softening», submitted for the Ph.D in specialty 8D07203 – "Mining Engineering".

Dissertation work of a doctoral candidate of KazNRTU named after K.I. Satpaeva

Baurzhan Orynbayev is devoted to the research of the technology of preliminary softening of the massif to increase the efficiency of ore crushing. The idea of the work is to use preliminary softening of the massif by drilling an additional number of wells, taking into account the zones of action of the blast wave and detonating charges with a capacity not exceeding the ultimate strength of the rocks being destroyed.

Based on the work performed, the following tasks were successfully solved:

- Analysis of methods for improving the quality of ore crushing.
- Substantiation of rational parameters for drilling a grid of wells, ensuring the creation of a preliminary softened state to reduce the specific consumption of explosives and the yield of oversized pieces of rock mass.
- Carrying out experimental and industrial blasting operations.
- Processing of experimental explosion data and formulation of recommendations.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 4 scientific articles and reports were published, including: 2 articles - in international scientific journals with Q1 and Q2 quartiles, included in the Scopus database.

3. The analysis of the subject of work of – Abdikarimova Gulnur Bakhytbekkyzy « Development of scientific and methodological foundations for creating a unified system of geomonitoring of the stress-strain state of the rock mass at the Kachar open-pit mine », submitted for the Ph.D in specialty 6D070700 – "Mining Engineering"

The doctoral dissertation of Gulnur Bakytbekkyzy Abdykarimova, a PhD candidate at Satbayev University, is dedicated to the development of scientific and methodological foundations for creating a unified geomonitoring system of the natural stress state of the rock mass at the Kachar open-pit mine. The system is aimed at forecasting and early warning of critical slope deformations under the influence of tectonic stress fields using modern monitoring technologies. The proposed approach makes it possible to identify patterns in the reorientation of principal stresses in tectonic fault zones, where alternating zones of tensile and compressive stresses are observed. Numerical modeling has revealed the formation of potentially hazardous zones of dynamic failure. The use of strength-based criteria within the modeling framework made it possible to reasonably identify deformation zones caused by tectonic stresses. The proposed geomonitoring methodology opens new prospects for the application of automated systems for slope stability monitoring under complex geodynamic conditions of open-pit mines.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 12 scientific articles and reports were published, including: 4 articles - in international scientific journals with percentile of 71%, 43% and 37%, included in the Scopus database;

4.The analysis of the subject of work of – Dinara Rakhimbayeva « Improving the methodology for I the coastline of the Caspian sea according to the data of remote sensing », submitted for the Ph.D in specialty 6D071100 – «Geodesy».

Dissertation work of the doctoral student of KazNRTU named after K.I. Satpayev Dinara Rakhimbayeva is developed method demonstrated the possibility of performing automated deformation control with the required accuracy. The Caspian basin is one of the largest endorheic areas on the planet, located in various landscape zones, has rare sturgeon fish stocks and valuable endemic biodiversity. Intense and frequent fires of forest, shrub and reed vegetation in the Volga River delta in the spring and autumn season also have a very negative impact on the biodiversity of the northern part of the Caspian Sea and the territory of the regions. To accomplish the set tasks, methods of remote sensing of the Earth were used. They included: analysis of existing domestic and foreign methods of monitoring water bodies; justification of the choice of scientifically based methods of performing measurements using equipment of satellite systems, space data Landsat, Sentinel.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 8 scientific articles and reports were published, including: 1 articles - in international scientific journals with percentile of 40%, included in the Scopus database;

5 **The analysis of the subject of work of** – Nurakynov Serik Maratovich «Assessment of the state of mountain cryosphere components using satellite technologies», submitted for the Ph.D in specialty 6D071100 – «Geodesy»

A dissertation in the form of a series of at least two articles and one review (published in journals included in the first and/or second quartile according to the impact factor data from Journal Citation Reports) of Nurakynov Serik Maratovich, a PhD candidate at Satbayev University, is devoted to a comprehensive assessment of the state and dynamics of changes in the main components of the mountain cryosphere of Zhetysu Alatau using modern satellite technologies. The study analyzes the spatio-temporal dynamics of glacier area, calculates the geodetic mass balance, and compiles a catalog of rock glaciers. For the first time, a catalog of rock glaciers in Zhetysu Alatau was compiled, the dynamics of glacier areas for 1956–2016 were mapped, and information on the geodetic mass balance of glaciers was obtained. A modified inventory method made it possible to improve the accuracy of assessing the condition of active rock glaciers. The practical significance of the work lies in the ability to predict the availability of water resources in the region and to take into account the rate of glacier degradation in the management of water resources, agriculture, and energy infrastructure. The data obtained on the movement of rock glaciers serve as a basis for reducing the risks of natural disasters such as mudslides, avalanches, and moraine lake outbursts. The average negative mass balance of glaciers (-0.44 m w.e.) reflects the trend towards an arid climate and forms the scientific basis for strategies to adapt the region's ecosystems. The results of the study are important for infrastructure planning, as the Aksu, Karatal, and Lepsa rivers, which originate in the Zhetysu Alatau, provide about 20% of the water supply to Lake Balkhash. The work contributes to regional initiatives in Central Asia on climate change and water security.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 5 scientific articles and reports were published, including: 3 articles - in international scientific journals with percentile of 92%, 92% and 84%, included in the Scopus database;

6 The analysis of the subject of work of – Urazaliyev Asset Seisenbekovich «Modernization of local geodetic network of Almaty city with use of satellite and gravity data», submitted for the Ph.D in specialty 6D071100 – «Geodesy».

The doctoral dissertation of Asset Seisenbekovich Urazaliyev, PhD candidate at Satbayev University, is devoted to the topical scientific and practical task of modernizing the local geodetic network of Almaty through the integration of satellite (GNSS) and gravimetric data, with the construction of a local geoid model. The subject reflects the transition from traditional methods to modern technologies of high-precision coordinate and height determination, which are in demand for engineering surveys and urban planning in the geodynamically active region of Almaty. Particular attention is given to ensuring the consistency of the local network with the global WGS84 system and the correct transformation between coordinate systems. The research methods included: analysis of existing domestic and international approaches to geodetic network modernization; justification of the choice of field survey techniques and office data processing methods; conducting long-term static GNSS observations at AGN points with their post-processing and adjustment in specialized software; development and validation of a local geoid model based on the integration of satellite and terrestrial gravimetric data; and application of mathematical statistics methods to assess the accuracy and reproducibility of the results. The obtained solutions are aimed at improving the accuracy of the planimetric and height reference framework of Almaty, as well as at the development and unification of the coordinate-height basis,

which corresponds to modern requirements of digital geodetic infrastructure and the practical needs of the industry.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 8 scientific articles and reports were published, including: 1 articles - in international scientific journals with percentile of 37%, included in the Scopus database;

7 The analysis of the subject of work of – Begimzhanova Yerkezhan Yernarkyzy of « Integration of Geospatial Data in the Assessment of Environmental Risk (A Case Study of Industrial Regions of Karaganda Region)» submitted for the PhD in the educational program 8D07306 – "Geospatial Digital Engineering"

The dissertation work of Begimzhanova Yerkezhan Yernarkyzy, PhD student at KazNITU named after K.I. Satpayev, is devoted to developing a methodology for the comprehensive assessment of environmental risks in the industrial areas of the Karaganda region based on the integration of geospatial and statistical data. The proposed scientific and practical approach is aimed at modeling the distribution of pollutants in the environment, forecasting ecological risks, and determining their impact on public health. Intensive use of natural resources, as well as the high concentration of emissions and accumulated waste, form complex environmental risks that affect the health of the population and the sustainable development of the territory. Traditional environmental monitoring methods often fail to provide sufficient spatial accuracy and a comprehensive assessment of risks. Modern technologies for working with geospatial data — integration of Geographic Information Systems (GIS), Remote Sensing (RS), environmental monitoring, and statistical data — open new opportunities for more precise and comprehensive evaluation of environmental risks. Combining various geospatial data makes it possible to identify spatial patterns of pollution, model the dispersion of contaminants, determine environmentally vulnerable areas, and develop evidence-based measures to reduce environmental pressure. The research work was carried out in the "Environmental Monitoring" laboratory of the Innovative Engineering Center of the Mining and Metallurgical Institute within the framework of the IRN BR21881939 " Development of resource-saving energy-generating technologies for the mining and metallurgical complex and creation of an innovative engineering center". Therefore, this research — aimed at integrating geospatial data for environmental risk assessment using the example of the Karaganda region — is highly relevant. It contributes to improving the scientific foundations and practical tools for environmental safety management, enhancing monitoring efficiency, reducing uncertainty in risk forecasting, and aligning with national and international strategic priorities.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 11 scientific articles and reports were published, including: 2 articles - in international scientific journals with percentile of 96% and 86% included in the Scopus database;

8 The analysis of the subject of work of – Aben Ardana Serzhankyzy of «Improving the methodology of 3D reconstruction of overhead power transmission pylons based on geospatial data » submitted for the PhD in specialty 6D0711 – « Geodesy ».

The dissertation work of Aben Ardana Serzhankyzy, PhD student at KazNITU named after K.I. Satpayev, is devoted to solving an urgent scientific and practical problem related to improving the processes of monitoring and diagnostics of energy infrastructure facilities. The growing scale of operation of overhead power transmission lines, increased loads on energy networks and the impact of natural and climatic factors determine the need to introduce new geospatial technologies

that provide an accurate, prompt and objective assessment of the technical condition of overhead power transmission poles. In this regard, the development and improvement of a methodology for 3D reconstruction of overhead power transmission poles based on geospatial data is an important area for the development of digital monitoring and infrastructure management systems. The obtained scientific results confirm the importance of the study for the introduction of modern digital methods in the energy sector, improving the reliability of engineering structures and optimizing the lifecycle management of overhead power transmission poles. The main research results were obtained within the framework of PCF BR21881939 on the topic "Development of resource-saving energy-generating technologies for the mining and metallurgical complex and creation of an innovative engineering center" and performed on the basis of the research laboratory "Digital, computer modeling of ore extraction technologies from blocks of various structural complexity" of the innovation and engineering center of the MMC Mining and Metallurgical Institute of KazNITU. To solve these problems, a set of theoretical and empirical methods was used, including generalization and comparative analysis of existing approaches, mathematical modeling, experimentation, planning and processing of experimental data, as well as modern methods of processing point clouds. The research results have been tested and implemented in the production activities of AliGeo LLP, which confirms their practical significance and relevance in the development of geospatial technologies for the energy industry.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 11 scientific articles and reports were published, including: 1 article - in international scientific journals with percentile of 91% included in the Scopus database.

9 The analysis of the subject of work of – Ashimova Ainash Adilhankyzy of «Study of harmony preservation in subsoil development through waste processing» submitted for the PhD in specialty 8D07203 – «Mining Engineering».

The dissertation work of Ashimova Ainash Adilhankyzy, PhD student at KazNITU named after K.I. Satpayev, is devoted to the pressing scientific and practical issue of maintaining harmony in subsoil use through the reuse of production waste to enhance the competitiveness of the mineral resource complex. Use of waste from the mining and metallurgical complex and the fuel and energy sector contributes to sustainable development, reduced environmental impact, and more efficient use of natural resources. Importance of these objectives is confirmed by the state environmental agenda and the implementation of the Green Kazakhstan National Project. Research was conducted under grant № AR14871694 from the Ministry of Science and Higher Education of the Republic of Kazakhstan for 2022–2024. This research was conducted under grant № AR14871694 for the development of a technology for processing ash and slag waste from thermal power plants to produce in-demand building materials. They also align with the fourth objective of the program-targeted financing for 2023- 2025- creation of a joint venture to produce new and promising building materials based on waste from mining and metallurgical complexes and mineral resources of Kazakhstan- being carried out at K. I. Satpayev KazNRTU. To address these objectives, theoretical and empirical methods were used, based on generalization, comparative analysis, experimentation, planning, and processing of experimental data. The research results have been implemented in production at the Akzhal lead-zinc deposit, operated by Nova Zinc LLC and Politech Construction LLC. Patents of the Republic of Kazakhstan for the utility model «Method for producing ash-containing binder» and «Composition of non-autoclaved ash-gas concrete and method for producing it» were obtained, as well as a Certificate for «Assessment of the suitability of enrichment waste for the purpose of creating mortars for strengthening fractured slopes».

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 15 scientific articles and reports were published, including: 3 articles - in international scientific journals with percentile of 69%, 51% and 42 % included in

the Scopus database;

4. Analysis of the work of official reviewers (with examples of the most low-qualityreviews)

№	Full name of the doctoral student	Reviewers	
		Full name of the first reviewer (position, academic degree, title, number of publications in the specialty for the last 3 years)	**Full name of the second reviewer** (position, academic degree, title, number of publications in the specialty for the last 3 years)
1	Ruslan Yegemberdiyev	**Erzhan Uteshov** PhD, Institute of Mining named after D.A. Kunayev	**Madiyar Sarybaev** Candidate of Technical Sciences, KazNU named after Al-Farabi
2	Baurzhan Orynbayev	**Erzhan Uteshov** PhD, Institute of Mining named after D.A. Kunayev	**Madiyar Sarybaev** Candidate of Technical Sciences, KazNU named after Al-Farabi
3	Abdikarimova Gulnur Bakhytbekkyzy	**Sarybayev Madiyar Abdullayevich** – Candidate of Technical Sciences, Senior Lecturer at the Department of Cartography and Geoinformatics, Faculty of Geography and Environmental Management, al-Farabi Kazakh National University	**Muzgina Vera Sergeevna** – Doctor of Technical Sciences, Senior Researcher at the company "Cifra-Asia"
4	Dinara Rakhimbayeva	**Yedil Sarybaev** – PhD, Acting Associate Professor of the Department of Cartography and Geoinformatics at the Kazakh National University named after Al-Farabi,	**Pentaev Toleubek** Doctor of Technical Sciences, Professor, Kazakh National Agrarian Research Institute
5	Nurakynov Serik Maratovich	**Edil Sarybaev** – PhD, acting associate professor at the Department «Cartography and Geoinformatics», Kazakh National University named after Al-Farabi	**Assel Altayeva**– PhD, associate professor of the Department «Geodesy and Cartography, Cadastre», International Educational Corporation LLC
6	Urazaliyev Asset Seisenbekovich	**Edil Sarybaev** – PhD, acting associate professor at the Department «Cartography and Geoinformatics», Kazakh National University named after Al-Farabi	**Assel Altayeva**– PhD, associate professor of the Department «Geodesy and Cartography, Cadastre», International Educational Corporation LLC
7	Begimzhanova Yerkezhan Yernarkyzy	**Sarybaev Edil Sauytovich** – PhD, acting associate professor at the Department «Cartography and Geoinformatics», Kazakh National University named after Al-Farabi.	**Umirbayeva Aliya Batukhanovna** – PhD, associate professor of the Department «Geodesy and Cartography, Cadastre», International Educational Corporation LLC.

8	Aben Ardana Serzhankyzy	**Sarybaev Edil Sauytovich** – PhD, acting associate professor at the Department «Cartography and Geoinformatics», Kazakh National University named after Al-Farabi;	**Umirbayeva Aliya Batukhanovna** – PhD, associate professor of the Department «Geodesy and Cartography, Cadastre», International Educational Corporation LLC;
9	Ashimova Ainash Adilhankyzy	**Sarybaev Madiyar Abdullaevich** – Candidate of technical sciences, Senior lecturer of the Department of Cartography and Geoinformatics, Faculty of Geography and Nature Management, Al-Farabi Kazakh National University.	**Pentayev Toleubek** – Doctor of technical sciences, professor of the Department of Land Resources and Cadastre, Kazakh National Agrarian Research University;

All reviewers have research experience, published works in the areas of dissertations and meet the requirements.

6 **Proposals for further improvement of the system of training scientific personnel.** Increase the requirements for the work of scientific consultants (especially from Kazakhstan) doctoral students in terms of the proposed topics of dissertation research and their leadership in the training of scientific personnel.

7 **Data on the considered dissertations for the degree of doctor of philosophy PhD, doctorof profile**

Dissertation Council	Code and title of specialty	Code and title ofspecialty
	6D070700 – «Mining» (8D07203 – «Mining engineering»)	6D071100 – «Geodesy» (8D07306 – «Geospatial digital engineering»)
Dissertations accepted for defense	4	4
Including doctoral students from other universities	-	–
Dissertations withdrawn from consideration	–	–
Including doctoral students from other universities	–	–
Dissertations that received negative reviews from reviewers	–	–
Including doctoral students from other universities	–	–
Dissertations with a negative decision on the results of the defense	–	–
Including doctoral students from other universities	–	–
Dissertations aimed at completion	–	–
Including doctoral students from other universities	–	–
Dissertations aimed at repeated defense	–	–
Including doctoral students from other universities	–	–

Deputy Chairman
of the Dissertation Council
on Mining and Geodesy,
doctor of technical sciences
Academician of the NAS of RK **B. Rakishev**

Scientific Secretary
of the dissertation Council
on Mining and Geodesy,
candidate of Technical Sciences **G.Meirambek**