Report

on the work of the dissertation council in the field of "Electric Power Industry" at K.I. Satpayev KazNITU on decisions on awarding (refusal to award) the degree of Doctor of Philosophy (PhD) in the specialty 6D071800 - "Electric Power Industry" and 8D07712 – "Electric Power Industry" for 2025.

1. Number of meetings held

During the reporting period, the Dissertation Council held 2 (two) meetings.

2. The name of the members of the dissertation council who attended less than half of the meetings is no.

3. List of doctoral students indicating the organization of training

№	Doctoral student's name	Organization of training
1	Bekbolatova Zhannat Kairovna	KazNRTU named after K.I. Satpayev
2	Abitayeva Rahimash Shanrakbayevna	KazNRTU named after K.I. Satpayev

4. Brief analysis of dissertations reviewed by the council during the reporting year

During the work, the dissertation council reviewed 2 (two) works, one in the specialty and one in the educational program. The names of dissertations by specialty and EP are given below:

№	Doctoral student's name	Work theme	Code and name of specialty and EP
1	Bekbolatova Zhannat Kairovna	Strategies for market integration of renewable energy objects and assessment of their impact on the sustainability of the energy system of Kazakhstan	8D07112 – Electric power industry
2	Abitayeva Rahimash Shanrakbayevna	Improving the Reliability of Ultra-High Voltage Overhead Power Lines Under Icing and Wind Load Conditions	6D071800 – Electric power industry

4.1 Analysis of the topics of the reviewed works

4.1.1 Analysis of the work by Zhannat Kaiyrovna Bekbolatova on the topic "Study of Market Integration Strategies for Renewable Energy Facilities and Assessment of Their Impact on the Operational Stability of the Power System of

Kazakhstan", submitted for the degree of Doctor of Philosophy (PhD) under Educational Program 8D07112 – Electric Power Engineering.

The dissertation work of Zhannat Kaiyrovna Bekbolatova is devoted to a highly relevant issue. The relevance of this research lies in the need to develop effective strategies and mechanisms for the successful integration of renewable energy sources (RES) into the power system of Kazakhstan. The research results make it possible to:

Assess the potential of renewable energy sources in Kazakhstan and identify optimal directions for their development.

Identify key problems and risks associated with the integration of renewable energy sources.

Develop recommendations for improving the regulatory and legal framework and market mechanisms.

Ensure the sustainable development of the energy sector and achieve climate and energy security goals.

The study also contributes to the scientific discussion on the problems of RES integration and provides practical recommendations for energy companies, government bodies, and other stakeholders.

The purpose of this dissertation is to study strategies for the market integration of renewable energy facilities into the power system of Kazakhstan and to assess their impact on the stability of power system operation.

Scientific novelty:

A Telegram channel application based on the Random Forest method has been developed, which forecasts temperature, solar radiation, and wind speed.

Methods for forecasting electricity generation from renewable energy sources based on modern mathematical models and machine learning techniques are proposed.

Strategies are proposed that enhance the stability of the power system with an increasing share of renewable energy sources in the country's energy balance.

The power system of the Almaty region has been modeled, and the impact of renewable energy sources on its stability has been assessed.

4.1.2 Analysis of the work by Rakhimash Shanrakbaevna Abitaeva on the topic "Improving the Reliability of Ultra-High-Voltage Overhead Power Transmission Lines under Ice and Wind Loads", submitted for the degree of Doctor of Philosophy (PhD) in the specialty 6D071800 – Electric Power Engineering.

The dissertation work of Rakhimash Shanrakbaevna Abitaeva is devoted to a topical issue. The phenomenon of conductor galloping has been studied for a long time; however, to date, effective measures to combat it have not yet been fully identified. Thus, galloping of ice-covered conductors worldwide remains one of the main problems in the design and operation of overhead power transmission lines. It significantly affects line clearances, cost, and reliability. Currently, the most urgent tasks for the power system of Kazakhstan in this area are:

Clarification of the conditions that contribute to dangerous conductor galloping.

Identification of territories where conductor galloping may occur, which must be taken into account in the construction and operation of overhead transmission lines, i.e., the development of a zoning map of territories according to the frequency of galloping occurrence.

Determination of the parameters of the oscillatory process.

Development of the most effective and economical means (dampers) for limiting and suppressing conductor galloping.

The purpose of the work is to improve the reliability of ultra-high-voltage overhead power transmission lines under ice and wind load conditions.

Scientific novelty of the work includes:

Study and analysis of the mechanism of conductor galloping occurrence.

Determination of the relationship between conductor galloping and external weather conditions and their influence on the nature of the galloping process based on statistical data on galloping in overhead lines.

Results of the study of free torsional oscillations of bundled conductors.

A mathematical model of conductor galloping that takes into account the nonlinearity of the object under study.

Results of the analysis of various methods for mitigating conductor galloping phenomena (at the level of inventions).

4.2 Connection of the topics of dissertations with state and regional scientific and scientific-technical programs, which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs;

4.2.1 The dissertation work of Zhannat Kaiyrovna Bekbolatova was carried out within the framework of the grant-funded project IRN BR21882294 entitled "Autonomous Energy Supply System for Remote Regions of Kazakhstan Based on Renewable Energy Sources" for the period 2023--2025. The dissertation corresponds to the priority area for the development of science in the Republic of Kazakhstan: 1) Energy and Mechanical Engineering.

4.3 Analysis of the level of implementation of the results of theses into practical activities.

4.3.1 The practical significance of the research conducted by Zhannat Kaiyrovna Bekbolatova lies in the development of a renewable energy generation forecasting model based on artificial intelligence methods, which improves power balance planning and reduces dependence on traditional energy sources.

The results of the dissertation were used in the implementation of the grant-funded project **IRN BR21882294** entitled "Autonomous Energy Supply System for Remote Regions of Kazakhstan Based on Renewable Energy Sources".

The research findings can be applied to the development of strategies for integrating renewable energy sources into the power system of Kazakhstan, thereby increasing its stability and reliability. The proposed economic approaches contribute

to the formulation of investment plans aimed at cost optimization and attracting investments. In addition, scenario-based modeling enables regional authorities to develop long-term infrastructure modernization plans, which will improve the environmental situation in the Almaty region and create new jobs, thus contributing to the socio-economic development of the region.

4.3.2 The practical significance of the research conducted by Rakhimash Shanrakbaevna Abitaeva lies in the possibility of applying the scientific and practical research results to improve the reliability of overhead power transmission lines and to protect conductors from breakage caused by ice and wind loads.

The study provides a basis for selecting effective methods for mitigating conductor galloping in overhead power transmission lines, as well as for developing recommendations for the design and implementation of galloping dampers.

5. Analysis of the work of official reviewers (with examples of the most low-quality reviews)

Persons were appointed as reviewers of doctoral students' dissertations for the degree of Doctor of Philosophy (PhD) in accordance with the requirements of the Model Regulations on the Dissertation Council.

Details of the assigned reviewers are provided below:

№	Doctoral student's name	Reviewers	
1	Bekbolatova Zhannat Kairovna	Almuratova Nurgul Kanaevna- PhD, Associate Professor of the Department of "Power Supply and Electric Drive" Almaty University of Power Engineering and Communications named after G. Daukeev	Orynbaev Seitzhan Aueszhanovich - PhD, Associate Professor of the Department of Electric Power Engineering andMember of the Board - Vice-Rector for Science and Digitalization, NAO Taraz Regional University named after H. Dulati
2	Abitayeva Rahimash Shanrakbayevna	Bolat Zharilkapuuly Kozhageldy – Candidate of Technical Sciences, Head of the educational program of the "Power	Ernur Tanirbergenovich Amitov – PhD, Director of the Institute of Energy and Green Technologies, Almaty University of Power Engineering and Telecommunications named

		Engineering" Department, Kazakh National University of Water Economy and Irrigation	after G. Daukeyev

Chairman
dissertation council for
"Electric power industry" **A. Bekbaev**

Scientific Secretary
dissertation council for
"Electric power industry" **A.A. Zhumatova**