

Research of the department

SCIENTIFIC RESEARCH WORKS CARRIED OUT IN THE DEPARTMENT

Subject of scientific research	Brief information about goals and objectives
1. PZ-202011293 "Development of energy-saving technologies that increase the efficiency of operation modes of pumping stations", practical grant of the Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan (2021 - 2024)	Purpose of work. To identify the main factors that affect the consumption of electricity in pump units and to develop the scientific basis of methods to reduce it. Duties: <ul style="list-style-type: none">• To determine the factors causing inefficient waste of irrigation water in experimental facilities;• Development of the classification of sensors for measuring and controlling the saving of water and electricity in the irrigation system;• Determination of factors causing cavitation process in pump units and modeling of their control system.

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2. State grant "Introduction of energy-saving technologies to the agricultural sector and improvement of their technical service".
- In order to create standards of electricity consumption in the agro-industrial complex at the level of current requirements, the parameters of consumers' regimes, technical, technological, organizational factors affecting electricity consumption and their interrelationships should be researched to calculate the standards of electricity. improved methods are required to be created at the state standard level.
- Purpose of work. The experiences of developed countries and the current situation and internal opportunities in the Republic of Uzbekistan in improving the methods of development of electricity consumption norms in the agricultural sector of the Republic of Uzbekistan are studied, and the current normative-legal, normative-technical and methodological documents in this regard is analyzed. A register of processes related to electricity consumption in the agricultural sector of the Republic of Uzbekistan will be created.
3. Development of intelligent measurement and control systems for agricultural and water management facilities.
- An intelligent system for measuring and controlling mechanical quantities (water pressure in pipes, cavitation process, angular displacement and acceleration, vibration, system for early detection of plant diseases) will be developed in agricultural and water management facilities. The results of experimental studies are treated statically.

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4. Development and research of efficient irrevocable high current converters with expanded functionality
Improving the efficiency and expanding the functionality of non-contact ferromagnetic converters with distributed magnetic parameters for monitoring and control systems without compromising the quality of technological processes.

 5. №314757 Introduction of innovative technology that saves electricity by measuring and controlling cavitation in pumping stations
November 15, 2023
The purpose of the work is to develop the scientific basis of the intellectual system of measuring and controlling physical quantities, which leads to the reduction of inefficient consumption of electricity and water resources at pumping stations. Scientific novelty of the research. It consists in the development of an intelligent system for measuring and controlling the cause of cavitation based on physical-technical effects such as air bubbles or water-air ratio in the suction pipe of pump units.

 6. Economic contract No. 136110 - "Development of the scientific basis for the introduction of energy-saving intelligent control systems by measuring and controlling cavitation in pumping stations", Ministry of Water Management of the Republic of Uzbekistan
August 24, 2022
The purpose of the work is to develop the scientific basis of the intellectual system of measuring and controlling physical quantities, which leads to the reduction of inefficient consumption of electricity and water resources at pumping stations. Scientific novelty of the research. It consists in the development of an intelligent system for measuring and controlling the cause of cavitation based on physical-technical effects such as air bubbles or water-air ratio in the suction pipe of pump units.