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THE MINISTRY OF HIGHER AND SECONDARY

SPECIALIZED EDUCATION

TASHKENT INSTITUTE OF IRRIGATION AND AGRICULTURAL MECHANIZATION ENGINEERS

Specialty: 5A311001 - Automation of Production and Technological Processes (in water management)

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Academic year: 2017-2019	Master: Ozodov Ezoz

Introduction (abstract of the master's thesis)

The task of increasing the efficiency of the technological process (TP) of water supply from the point of view of saving energy consumption by pumping station equipment in the water supply process and monitoring water quality, creating a dual mode of using a pump unit for individual use in irrigation and drinking water modes, taking into account indicators of water salinity, is considered. Creation of a system for monitoring the operation of a pump unit based on water quality indicators in the ecological environment of the Aral Sea. As part of the task, depending on the signals received from the process control system in real time, it is required to carry out the selection and recommendation of an effective mode with guaranteed maintenance of the TP parameters by developing a statistical model of the station's water supply system and then identifying the main factors affecting the key performance indicator (KPI) technological process. The aim of the work is to create a special system for young-sized pumping units for the implementation of a continuous waterfall process to the local population of the Aral Sea zone. Everyone knows that the ecological situation in the Aral Sea is considered critical, the main cause of this disaster is the drainage of one of the largest seas of the world. This catastrophe entailed more negative consequences, especially an increase in salt in the composition of the water of the area, as a result of which the flora and fauna of the ecological zone deteriorated. This directly affected the physiological indicators of the population, including due to the lack of drinking water. Some diseases were found among the local population. In addition, agricultural activities were restricted. One of the best solutions to this problem is to replenish resources with the help of groundwater, but even this method is not sufficiently effective and cost-effective. Salt exceeding the norms for drinking water was found in the composition of the groundwater of these regions, given the fact that the population is located at different points in the region. The regions have not implemented a centralized system of drinking water and sewage, the creation of water treatment facilities in this region is unprofitable and problematic in terms of technological solutions. To eliminate the above mentioned problem and create a special system for the ecological zone of the Aral Sea, the department of automation of technological processes in production Tashkent Institute of Irrigation and Agricultural Mechanization has developed a special automation system that can combine two systems of water purification and irrigation for rural land and for the consumption of the local

population [1]. The connection of the dissertation research with the plans of research works of the higher educational institution. This work is made on the basis of the main topic “Automation of technological processes in water management”. to create an automation system for an individual-use pumping unit that can combine water treatment and irrigation for the Aral Sea ecological zone. The water treatment system is a pumping unit and reverse osmosis (rivers osmosis), the irrigation system is also connected to the pumping unit and is a tank of salt and drinking water concentrator to the desired condition. Results: this system uses special sensors to indicate the quality of water and the required mode based on this data, the system starts the need for an algorithm built into the controller.

In the course of the master thesis the following tasks are solved:

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- acquaintance with the specialized literature:

- technological regulations and internal documents of the enterprise,

- special literature and Internet resources on the topic of master's thesis,

- study of models of pumping equipment,

- the study of methods of regulation of pumping equipment and the integration of the unit with a conductometer

- development of an algorithm for improving the efficiency of pumping equipment,

- creation of a pumping equipment control system based on the developed models and algorithm.

Object and subject of study: The object of research of research is considered to be a mobile pumping station for personal use.

Research methods: During the research of the object, such methods were used as: Statistical modeling, Simulation modeling and expert assessments of the system were made.

The analysis of the system was made with the help of Correlation and regression analysis and a functional dependence was created.

Scientific novelty of research: the use of conductometer in the system as an indicator of the process of filtration with a combined type Testing the results of the study: This system was simulated in the MatLab software environment based on SimHydraulics, the results showed within the normal range and are optimal for use. This system was evaluated by experts of the international forum and is under the gold medal of FORUM 2019 “Constructions The formation of living environment”. Publication of the research results: The research results were published in the form of 10 scientific articles from them 6 International conferences 2 traditional conferences of the institute and 1 publication in foreign educational institutions. The structure and scope of the thesis. The dissertation work consists of the Introduction, 4 chapters, conclusion and bibliographies (54 literature and scientific materials). The thesis consists of 77 sheets, 4 schemes, 17 images and 2 tables.