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Use of energy-saving operational technological systems in automation processes

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Abstract: In this article, I have developed an energy-saving operating system system that includes remote control of technological processes and we tried to use this system scheme to automate robotic processes with the help of central monitoring equipment installed in buildings. Automation in technological processes on behalf of operations, we will be able to provide extensive opportunities for remote working to automatically perform energy-saving operations. In addition, as another feature, the system requires only a local network to connect, and we can automate based on the specifications of the central monitoring equipment, which ensures automatic operation regardless of networks. By objects designed to save energy this system consists of the optimal operation of the heat source system, the adjustment of the temperature of the supply water, and also heat source equipment, room temperature adjustment and outside air intake volume adjustment options are also available. Currently, the process automation operations manager has the role of performing these energy-saving operations, however finding the optimal value for each of these operations is causing difficulties and problems. Operational management in the technical system, is also responsible for tasks outside of facility operations such as maintenance management, therefore, regularly changing the optimal settings can be a very complex technological process. This system uses robotic process automation technology, so it can do everything and we will have the ability to effectively manage energy saving operations that can be performed by the central technological monitoring equipment.

Keywords: Scheme of energy-saving technological system, automation of technological robotic processes, technological monitoring building management device, automatic operation system control, technological stages of continuous and optimal operation,

Introduction

The purpose of this article is to provide a comprehensive overview and therefore reference to available methods, techniques and technologies to improve energy efficiency industrial robotics and mechatronic systems, in particular, are concerned with the consumption of electrical energy. This document is intended to be a reference for engineers and scientists, research on new solutions to increase the efficiency of industrial robotics and mechatronics systems has been carried out. Various the currently available options are divided here into hardware and software. The first takes advantage of the availability of new materials, which allows for an even lighter design and the scheme of the necessary structural-mechanical technological system will consist of providing features. Hardware solutions also include technologies. Until now we make extensive use of technical systems to implement new types of technological process automation systems, as well as

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energy recovery and distribution strategies. This allows to create new scenarios of reducing energy consumption and therefore less impact on the environment. The software solution begins with the idea that energy consumption in industrial production and objects mainly result from the operation and control of automated electric drives. In technological systems the advantages of manufacturing processes such as assembly and packaging ensure very high efficiency. Mostly machines and robots work. in enterprises dynamically to maximize production results, increasing productivity brings about both. In technological processes high energy losses at high speeds, as well as excessive energy consumption processes during deceleration are often observed. In addition, many axis motion tasks come with downtime associated with loss of productivity. Therefore, the methods of minimizing the consumed energy have become important. Success is being achieved in the introduction of energy-saving equipment in Uzbekistan various types of opportunities are created. At the same time, energy saving measures are continuously required high-efficiency operation of existing facilities (hereinafter referred to as "optimal utilization measures") is recommended as an effective approach. Here, "optimal operation" means technological system actions and attempt to make optimal adjustments to the performance of equipment, devices and systems and includes programs for determining control values. It includes the optimal operation of the heat source equipment and the adjustment of its supply, water temperature, adjustment and adjustment of outdoor air intake volume for air conditioning use air conditioner (room) temperature adjustment and control. In Uzbekistan, such operations are called "energy-saving adjustment" systems. We are widely promoted as well as providing energy saving assessment tools. Technological processes, facility equipment and systems are advanced and complex, so that operational managers can find optimal values of the system scheme (hereinafter referred to as "optimal operating values") conducted a number of studies to operate facility equipment and systems with high efficiency. Also, optimal goals in a large-scale operation and process system that includes heat source equipment and air conditioning equipment, the operations manager cannot consistently achieve optimal results.

Information about the scheme of the technological system

The schematic structure of the technological system is shown in Figure 1. This is a technological scheme of the system installed inside the building. The system circuit is automatically connected to the central monitoring equipment through local networks and controls the processes of optimal operation of facility equipment. The central monitoring equipment is controlled through a remote control technological scheme. Here is "central monitoring equipment management" is equivalent to a building automation system that collects and displays various items. In technological processes types of data such as building energy data and disaster prevention data and facility startup/shutdown equipment, sets room temperature and helps control various automated technological processes. In a traditional installation, the operations manager manages the technological process and automatically starts the corresponding facility equipment.

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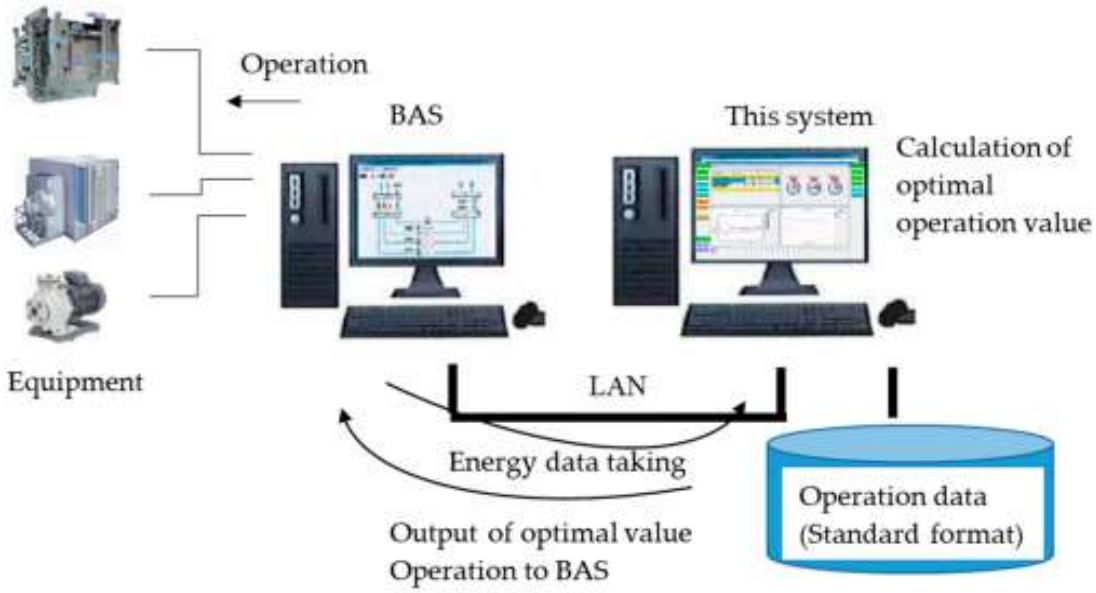

Picture 1. Scheme of the technological system

The second step of the considered technological process scheme is the lighter design of the components for reduction moving masses; this means reducing the weight and inertia of the arms. In this way, control of the technological system the torque can be reduced, which in turn consumes less energy and makes it easier to control. Systems processes explore arms made of ultra-lightweight carbon fiber-reinforced polymer, with optimal the design of a serially connected robotic manipulator is evaluated. In the second, the goal is to find weapons. Based on the system minimization optimal diameter and optimal size of light holes consists of mass management without detrimental effects on structural-mechanical behavior. Following the well-known idea of reducing moving masses by moving the actuator various solutions have been proposed for the robot base, manipulators of serial connection of processes. In these works, the ability to mount the engine near or on top of the chassis is often achieved through the transmission.

Schematic of technological system software stages

The sequence of software steps of this technological system scheme is shown in Picture 2. This program scheme consists of a technological program and obtaining energy data from an automated system and storing this data in a database in a standard format, simulation tools for calculating optimal work values, software for comparing optimal work values and current operating values, based on automatic operation software for remote control of automation in the system implements program processes to display optimal operating values and operation messages.

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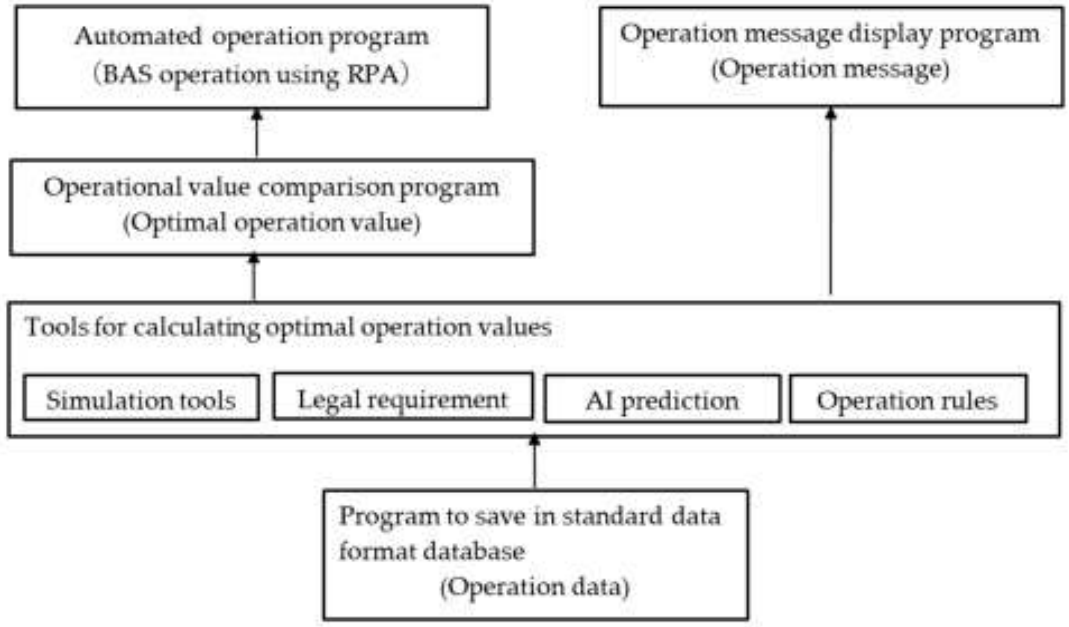

Picture 2. Scheme of the sequence of software control processes in the automation of technological processes.

Conclusions

This article provides a comprehensive review of studies and is therefore considered a reference. Enterprises available methods, techniques and technologies to increase the energy efficiency of the industry information about the process stages of robotic and mechatronic systems is presented. From hardware, software system and first class mixed techniques, different approaches and methodologies are revised and basic the results were recorded. On the one hand, the hardware approaches found in the literature are classified, into three main categories, namely robot type selection, hardware replacement, and hardware addition. On the other hand, software approaches rely heavily on modification and optimization. Technological system action planning phase and divided into two different groups, i.e. trajectory, consists of optimization and performance planning. Finally, mixed approaches were presented, including state-of-the-art techniques using hardware and software modification show the main. The hybrid approach is currently seeing the rise of new solutions consisting of various combinations, hardware and software techniques drive the foundation of new formulations. This design approach offers significant potential for reducing the required energy or increasing productivity in mechatronics and industrial robot systems also provide ample opportunities to open up new optimization applications. Otelbayev Azizbek, a student of the Nukus Mining Institute at the Navoi State University of Mining and Technologies, conducted research and scientific work on the stages of automation of technological processes in the activity of mining enterprises. Azizbek has published many articles on technological processes in mining enterprises. Interests: management of technological processes in mining enterprises, chemical processes, metal melting furnaces, activities in mining enterprises. Otelbayev Azizbek is

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currently using energy consumption in technological systems, energy saving in simple mechanisms. Mining enterprises are conducting research on reducing energy consumption in most processes and increasing the productivity of operations. Energy is the most important means of controlling this technological process.

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