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Секция 7. Информационные технологии, автоматизация и системы управления**

**THE STUDY OF AUTOMATION APPLICATION IN TECHNOLOGICAL PROCESSES**

V.A. Gorbachev

National Research Tomsk Polytechnic University,

Russia, Tomsk, Lenin Avenue. 30, 634050

E-mail: [kophep17@gmail.com](mailto:kophep17@gmail.com)

Nowadays it is difficult to imagine the world without special automated machines. This equipment allows us to accelerate the process of manufacturing products from the time of machine programming to the final product receipt. However, automation has both positive and negative sides.

Firstly, we need to understand the definition of the concept. Automation of the process is a set of methods and tools for implementing the system or systems to be controlled without direct human intervention, or with the man's participation in making the most important decisions.

There are several types of automation: 1) Partial - the automation of individual devices, machines, manufacturing operations; 2) comprehensive - provides the automation of the process area, shop, or enterprise operating as a single, automated system; 3) complete - the highest level of automation, in which all production monitoring and control functions (at the enterprise level) are delegated to the machines.

Let us consider a few industries using this technology:

- Automation of metallurgical manufacture is subject to static and dynamic weighing equipment (e.g. conveyor system). The implementation of security systems and access control has been provided.
- In the agricultural sector an automated system is used to ensure an optimum microclimate, as well as fully automated watering systems, ventilation and heating.
- In mechanical engineering different sensors connected to the controller, the feedback circuit and remote control, turning, milling, and multi-CNC are used. Temperature monitoring system and metal casting into molds are applied.

Having considered the various sectors of the industry, it will be possible to draw a conclusion about the processes that rely on the machine and those, you can trust to man and suggest what modern industry needs automation contributing to the aim of the research.

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**DEVELOPMENT OF THE DEVICE SENDING SMS MESSAGES TO POINT GUARD OF THE  
ENTERPRISE USING THE MAGNETIC CONTACT SENSOR AND GPRS MODULE**

M.A.Gulyaev, R. A. Kondratenko

National research Tomsk Polytechnic University,

Russia, Tomsk, Lenin Avenue, 30, 634050

During the period of technical innovation, the pace of life has become fast, and we shouldn't forget about the rash actions, which can lead to dire consequences. One of such problems is that people forget to close the premises, or

do not remember, whether they closed the door or not, but it can be unsupervised property of the enterprise or equipment, that it is life-threatening.

In order to protect the company from breaking into and entering, it was decided to develop a device alerting the point guard via SMS that the room is closed or opened. If the door is opened, there is a SMS notification that you want to close the door.

This invention makes the production process more secure. Also, this device will not have a magnetic contact sensor (reed), which has a number of disadvantages, such as:

1. Relatively low sensitivity for management of MDS;
2. Susceptibility to external magnetic requiring special measures to protect from exposure to them;
3. Considerable time vibration of contacts, which can be up to half the operating time;
4. Low power switched circuits;
5. The possibility of spontaneous breaking of contacts at high currents;

Moreover, this gadget will not be as expensive as other instruments of security type.

The "smart lock" has been selected as a development object. The device allows protecting the control room based on the information from the sensor located in the castle. When opened, the sensor signal is applied to GPRS module, and the module, in its turn, sends SMS message to the point guard. Management is carried out automatically.

During the project development, the work was carried out using the Arduino and GPRS Shield, which will help to realize the idea of "smart lock". The assembly and improvement of this gadget are worthwhile further researching. It is supposed that this device will be an indispensable thing protecting any premises.

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#### РАЗРАБОТКА МОДЕЛИ КОНТУРА УПРАВЛЕНИЯ ТОКОМ В ОБМОТКЕ ТОРОИДАЛЬНОГО ПОЛЯ (TF) ТОКАМАКА КТМ

В. А. Бадмацзыренова

Национальный исследовательский Томский политехнический университет,

Россия, г.Томск, пр. Ленина, 30, 634050

e-mail: [vab20@tpu.ru](mailto:vab20@tpu.ru)

ТОКАМАК КТМ является экспериментальной термоядерной установкой для отработки задач материаловедения на предмет радиационной стойкости.

Достижение проектных параметров плазмы в установках ТОКАМАК невозможно без создания моделей и комплексов программ, направленных как на моделирование процессов в плазме, так и на управление этими процессами.

В ходе выполнения научно-исследовательской работы была разработана структурная схема автоматизированной системы с учетом реальных ограничений технических элементов контура управления. Проведены расчеты для определения передаточных функций обмотки тороидального поля ТОКАМАК КТМ, как объекта управления. Спроектированы регуляторы тока и напряжения и разработана модель контура