

# Electronic Document Management Designed To Provide Control of Railway Automation and Telemechanics Devices

Elmurod Astanaliev<sup>1</sup> and Dilshod Baratov<sup>2</sup>

<sup>1</sup>Department of Automation and telemechanics of Tashkent state transport university” Department, Master’s student, Tashkent state transport university, Tashkent, Uzbekistan [elmurod1246@mail.ru](mailto:elmurod1246@mail.ru)

<sup>2</sup>Scientific adviser, Department of Automation and telemechanics of Tashkent state transport university” Department, DSc, associate Professor, Tashkent state transport university, Tashkent, Uzbekistan

**Abstract-** The article discusses the issues of the functional support of the automated system of accounting and control of railway automation and remote control devices: signaling, centralization and blocking; components of the electronic-executive part of the system are presented; proposed a conceptual model and describes the design features of the developed automated system.

**Keywords** - railway automation and remote control system, alarm devices, centralization and blocking, components of the electronic-executive part, conceptual model and design of an automated system of accounting and control devices.

## 1. INTRODUCTION

The use of various types of automated workstations, automated control systems, as well as elements of increased reliability, backup and duplication schemes in signaling, centralization and blocking devices (SCB) creates the prerequisites and is a condition for switching to the maintenance and repair technology for maintenance work: The use of repair and restoration technologies for certain types of signaling equipment will allow: to increase the safety of train traffic and the efficiency of transportation management based on the high reliability of the serviced devices; to ensure the implementation of additional organizational and technical measures to improve train traffic safety by reducing the specific labor intensity of maintenance and increasing labor productivity [1].

Further automation of the control of device parameters using digital and analog signals will enable a switch to the restoration technology of servicing virtually all elements of the signaling equipment. At the same time, an important place will be given to the reservation and use of highly reliable elements with extended service life equal to or close to the service life of the electrical centralization systems, automatic locking, centralized control room, etc.

Currently, some of the technical means have developed a service life or are approaching this (in the signaling devices, this is about a quarter of the existing ones). In order to prevent further aging of the devices, the employees of the signaling and communication farm will have to significantly increase the pace of modernization of technical equipment in the coming years. At the same time, newly developed and developed domestic and foreign systems of electrical interlocking, automatic blocking, dispatching interlocking on a microprocessor basis should be introduced.

At the same time, it is necessary to switch to new modern service technologies. The task is to automate the maintenance of devices as much as possible through technical progress, minimize the likelihood of the negative impact of the human factor on the process of ensuring trouble-free operation of technical equipment and,

consequently, on the state of traffic safety of trains [2]. Considering that at present it is impossible to complete production with highly qualified and responsible executors, the task is to ensure the centralization of control over the condition of technical means and the correctness of performers.

Specialists of signaling and communication industry play a special role in improving the efficiency of the industry and ensuring the safety of train traffic. The successful solution of problems will be facilitated by the creative interaction of the workers of this most complex production and technological complex .

To organize the accounting of railway automation and remote control devices, tracking their movement and operational identification, it is proposed to use an automated system for accounting and control of signaling devices.

## 2. MAIN PART

Automated system of accounting and control of RSAT devices is intended for automation of accounting and control of railway automation and remote control devices, as well as for planning the operation of the repair and technological section (RTS) or control and measuring point.

Creation of ASO-CRAT aims to improve the quality and efficiency of work on the replacement and repair of signaling systems, the reasonableness of decision-making by experts and managers of the signaling and communication distance of the frequency response, signaling and communication departments автомат and the laboratory of automation and telemechanics by automating the planning, optimization and control of performance of work [3-4].

The automated system is used in the distances of automation and telemechanics of the railway. The main functions of the automated system:

- The creation and maintenance of a database that includes the passports of specific devices and information about the place of their installation;
- Tracking movements of devices in connection with periodic replacements, write-offs, receipts, etc.;
- Planning the replacement of devices with the issuance of technologically necessary information;

- Monitoring the implementation of replacement plans for devices;
- Failure device analysis of alarm devices, centralization and blocking;
- Planning of the repair and technological areas;
- Issuance of output documents, the ability to search for devices in the database for arbitrary requests.

**1. Components of the electronic-executive part of the system**

The operation of the automated control systems is based on the use of a special program - a document flow server. The server performs the main functions that ensure the work of users: search for equipment from the database, report on the number of devices, read a QR code. Until the main program is launched, user interaction with the document management system and working with documents is impossible.

The ASO-CRAT program server runs on a computer connected to the signaling and communication distance network, which is also called a server. For the server, it is possible to allocate a separate computer or use one of the network workstations. It should be noted, however, that the registration of new devices and the creation of instrument-related tasks and reports lead to an increase in the size of the database and an increase in the disk space it occupies; therefore, it is necessary to ensure sufficient capacity of hard disks taking into account the prospects for increasing the flow of information.

In addition to these functions, the system administrator also provides for starting and stopping the ASO-CRAT server, setting up and maintaining the system, creating backup copies of the system databases and restoring the system to work in case of failures.

User part The employees of the signaling and communication distance registered in the system determined by their official duties are called users of the system. Depending on the type of activity, the system user is assigned by the administrator the right to perform certain actions and access certain functions [5].

System users can be assigned the following rights:

- Maintain a new section
- Maintain a new equipment
- Maintaining repair information
- Maintain stock information
- Print QR code
- Reading a QR code

**2. Conceptual model of the automated system of accounting and control of signaling systems.**

When new equipment is introduced, users included in one of the lists, by default, receive the corresponding rights - to view or edit the document.

When registering, several semantic parts are added during registration, which, in turn, occupy the corresponding places in various database tables.

The conceptual model and structure of data processing of the automated system for accounting and control of signaling systems are presented in Figure 1.

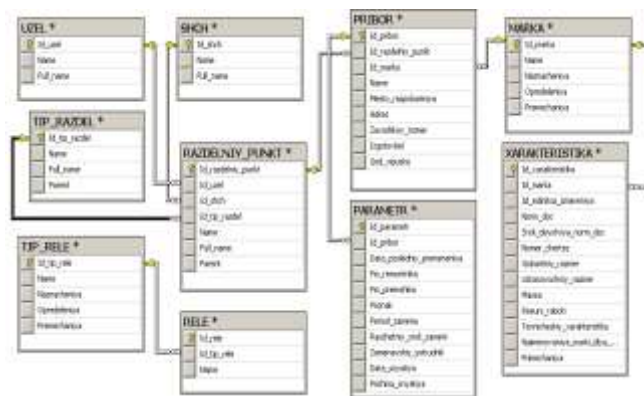


Fig.1. The structure of the data processing of the automated system of accounting and control of signaling systems.

**3. CONCLUSION**

Electronic document management on the basis of full functional support and development of the electronic-executive part of the system for monitoring and recording railway automation and telemechanics devices in the form of automated control systems allows the management and distance of signaling and communication, as well as enterprises involved in the processing of technical documentation to be significantly increased.

The article describes the main components of the ASO-CRAT. The structure of data processing, the conceptual model, the scheme of functioning, the design features of the developed automated accounting and control system are presented.

The transfer of innovation to small business determines, firstly, the use of cost-effective methods of capital investment in business, secondly, the correct placement and efficient use of productive forces, and thirdly, scientific and technological progress and the development of the economy as a whole.

**4. REFERENCES**

5. Bulavsky P.E. Conceptual model of electronic document management technical documentation // Transport of the Russian Federation. - 2011. – No. 1 (32). - pp. 60-63.
6. Aripov N. M., Baratov D. Kh. Methods of constructing a mathematical model of electronic document management technical documentation of railway automation // Automation on transport. - 2017. - V. 3. – No. 1.
7. Baratov D. Kh., Aripov N. M. Development of the accounting and control system for electrical engineering complexes of railway automation and remote control // Basic and applied scientific research: current issues. - 2018. - p. 64.

8. Sokolov S. S., Belyaeva N. A. Functional structure of the automated control system for transport and storage infrastructure // Bulletin of the State University of Maritime and River Fleet. Admiral SB Makarova. - 2012. - No. 3 (15).