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OPTIMIZATION OF THE SERVING AND REPAIR CYCLE DURING THE LIFETIME OF THE BUS

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The problem of maintenance and repair of the bus cycle in the servi-be for his life, which indicates the possibility of improvement and development of subjects ", mainte- nance and repair of vehicles".

Urban public transport in Belarus is represented by buses, trolleybuses, trams, subways and taxis. Bus routes exist in all cities of the country. Trolleybus opened in seven cities: Minsk, Gomel, Mogilev, Vitebsk, Grodno, Brest and Bobruisk. Tram lines are routed through the streets: Vitebsk, Minsk, Mozyr and Novopolotsk. Two subway lines operate in the capital of the Republic – Minsk.

These statistics suggest that the buses for the modern life of urban residents are of great importance, since they are the most common of all vie-ing traffic. Currently, the largest number of buses carrying passengers.

Continuous operation of the bus and its operation modes are directly dependent on their technical condition. From conditionality implies the purpose of work.

Purpose - to provide the minimum cost of maintaining the bus fleet model MAZ 103 in good condition for normative life. Maintenance and repair should ensure a better result for the entire life cycle of the bus.

Maintenance of the reduced model in the basic operation period is divided into the following types: daily maintenance, maintenance after the first 1000-1300 kilometers, the first maintenance (maintenance -1, produced every 10,000 kilometers), the second maintenance (maintenance -2, produced by every 30,000 kilometers, but at least twice a year) and seasonal service [1].

However, provided repair and service cycle is not fully perfected, bathrooms, as failures and lack of timely maintenance leads to not exit the line, which provides the discomfort of passengers and increased car park to replace them in case of failure.

The first step will be to optimize the planning of the experiment.

Experimental Design - is a procedure for selecting the number and conditions of the experiments, necessary and sufficient for the task with the required accuracy.

This substantially as follows:

- the desire to minimize the total number of experiments;
- simultaneous variation of all the variables that determine the process by special rules - algorithms;
- the use of mathematical apparatus formalizing many of the actions of the experimenter;
- choice of a clear strategy to make informed decisions after each series of experiments.

For the work performed will be the selection of an extreme experiment.

Planning an extreme experiment - a method of selecting the amount and conditions of the experiments, the minimum required in order to find optimal conditions, that is, to solve the problem [2].

To solve the optimization problem of the most important use of simulation, which will enable to process statistical data and to obtain the necessary pattern-maintenance and repair.

Simulation is increasingly gaining popularity in the scientific field, as the solution to any problem you can bring it to this method.

The simulation model - a computer program that describes the structure and reproduces the behavior of a real time system. The simulation model allows to obtain more detail by sub-statistics on the various aspects of functioning of the system depending on the input data.

The use of simulation models has many advantages in comparison with the performance of ex-ments of the real system and the use of other criteria: cost, time, repeatability, accuracy, clarity, flexibility.

Simulation stages are as follows:

1. Forming the basic questions about the behavior of a complex system, the answers to which we get ho-team. Many of these questions allows you to define a set of parameters that characterize the state of the system - the state vector (here, in addition to art researcher, requires a deep knowledge of the real system).

2. Implemented by decomposition of the system into simpler parts – blocks domains. In one domain together "related", ie. E. Close or transform according to the same rules of components of the state vector and the processes they convert (it requires knowledge of the real system).

3. Formulated laws and "plausible" hypotheses about the behavior of both systems, we as a whole and its individual parts. It is very important to note that in each domain to describe it-Sania usually used their mathematical formalism (algebraic and differential equations, mathematical programming, etc.). The most suitable for the respective domain. That blast principle enables the construction of a simulation model to

establish the necessary proportions between the accuracy of the description of each domain block, its security information, and the need for simulation purpose.

4. Depending on the issues assigned to the researcher introduced the so-called system time, simulating the passage of time in a real system. Although it is not the physical time, but not a mathematical reversible and irreversible unidirectional present time, in which the principle of causality can be implemented.

5. Formalized way are given the necessary phenomenological properties of the system and its individual parts. Often, these properties generally can not be justified at the present level of knowledge, and based on long-term monitoring of the system. Sometimes, however, in terms of getting answers to our questions one phenomenological property is equivalent to the set of complex mathematical relationships and successfully replaces them. (At this stage it requires a profound knowledge of the simulated physical system, of course, if we want to achieve a high degree of adequacy of the model to the real object).

6. Randomly parameters appearing in the model, compared some of their implementation, continuing for one or more cycles of the system (model) of the time. Next discover new implementation.

The simulation model of the problem being solved.

This process includes the following steps:

1. The exact formulation of the research objectives;

2. Gather information and data;

3. Development of a conceptual model. To test the components of the model used quantitative methods - graphics, fit tests, test Kruskal-Uolisa;

4. Verification of the adequacy of the conceptual model to the task and execute the critical structural analysis;

5. Transfer the conceptual model using the software in the machine representation-tion;

6. Verification of the programmed pattern. At this stage, a sensitivity analysis-telnosti and validation of the output data of the simulation model;

7. If the adequacy of the model is not supported, depending on the detected error, not necessary to return to the first, second and third step;

8. Development, execution and analysis of experiments;

9. Documentation and presentation of the results.

One of the most common tools are the Arena, Extended, AnyLogic, AutoMod, Promodel.

To solve this problem the most suitable medium of AnyLogic is, it has a number of advantages: high flexibility to choose an approach, a comprehensive approach has all your stvami-to develop a simulation model [3].

Thus, the more it becomes necessary to research topics of "technical, maintenance and repair of vehicles": keeping them in good condition during their use-NII as intended within the specified service life. This suggests that the optimization serve-repair cycle-linking has relevance in scientific research and study.

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