3. The results of our studies show that savings technology cultivation Strip-Till compared with traditional on the basis of domestic or foreign equipment is not significantly different and is approximately at the same level, cost of work 76%, fuel consumption - 70% of direct operating and reduced costs - 60-70%.

4. established that the cost of work (labor) and fuels for domestic appliances Strip-Till technology yields somewhat foreign, but spending per unit of work in 1,7-2 times smaller.

5. Subsequent studies appropriate to the technology for a comprehensive assessment of Strip-Till combined primary, preplant tillage, fertilization and seeding of cultivated crops.

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With a view kolychestvennoy otsenki polosnoy and tradytsyonnoy technology obrabotku soil made of the effectiveness rationale s use.

Technology, processing soil, Strip-Till.

In order to quantify the tape and traditional technologies of processing conducted study the effectiveness of their use.

Technology, tillage, Strip-Till.

UDC 631.004.1

METODOLOHICHNIST OF TECHNOLOGY OPERATIONS rehabilitation AGRICULTURAL MACHINES with limited resources

IL Rogovskiy, Ph.D.

In the article the methodological approach to describing stochastic ensure the efficiency of agricultural machines.

The efficiency of the machine, stochasticity.

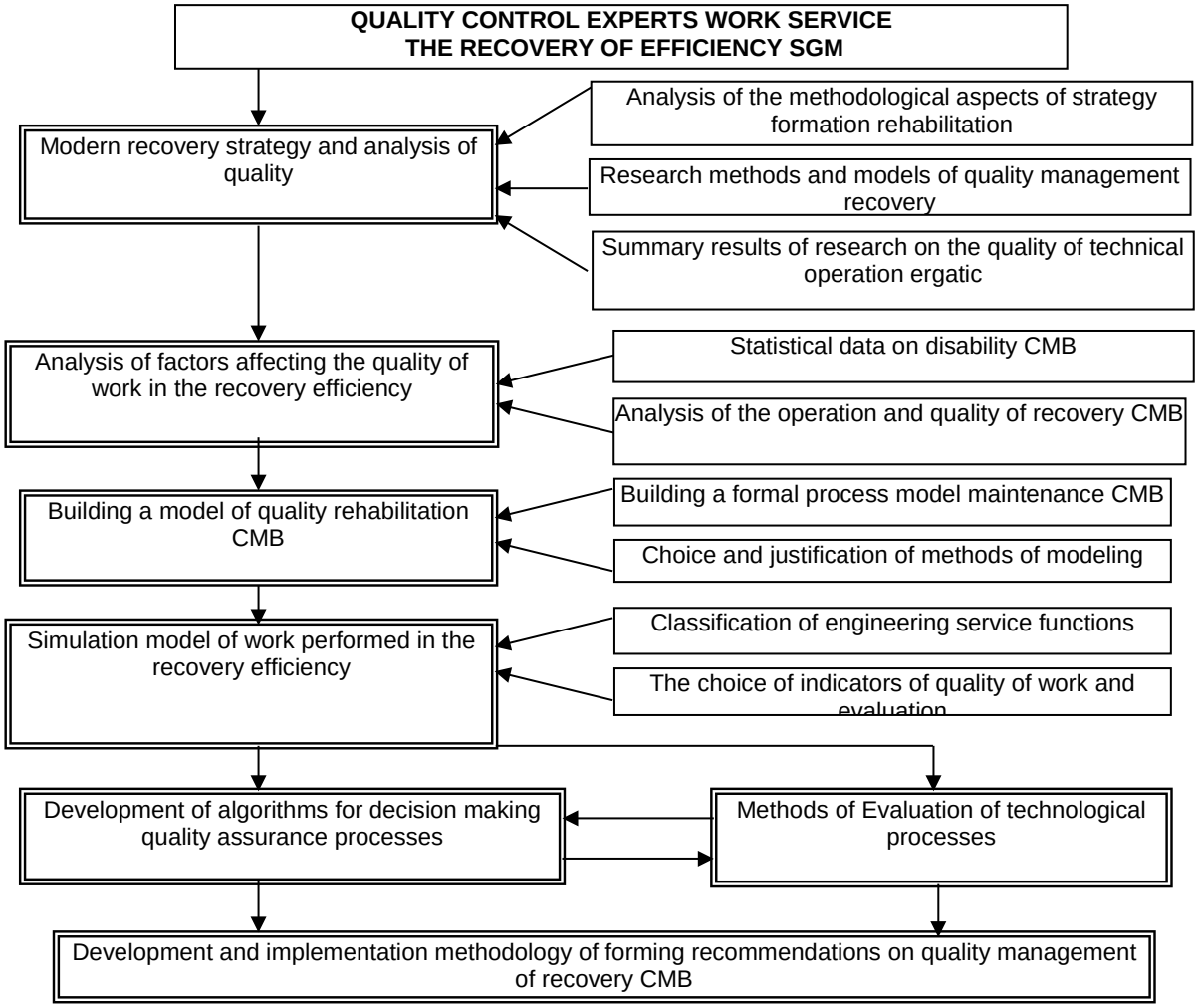
Formulation of the problem. Analysis of the most typical mathematical models of farm machinery recovery shows that they can assess the impact of measures to control the technical readiness only on individual characteristics and properties of the technical units and mechanisms, under the assumption that does not fully reflect the conditions of operation of technical systems in general. Thus, in many cases, the characteristics of reliability agricultural machines determine the function of only one frequency performance of maintenance, and the completeness of maintenance technical control effectiveness and quality of work are not counted. For there is a multi-stage agricultural machinery maintenance (preventive measures carried out

many have different types and range of manufacturing operations) and each type differs in meaning completeness recovery, frequency and quality of maintenance.

Analysis of recent research. Research [1-8] devoted to building model processes of rehabilitation engineering and the development of standard functional structures specific to the maintenance of machines on which solved the problem and process optimization maintenance machines.

The purpose of research. Methodological prerequisites for optimizing the performance of manufacturing operations from recovery of agricultural machines with limited resources.

Results. Simulation of the real process of rehabilitation of agricultural machines performed as a combination of a limited set of standard functional engineering structures for which the developed mathematical formulas for assessing their quantitative characteristics (Fig. 1).



PIP. 1. Scheme of Studies.

To take into account various factors that affect the quality of maintenance, maintenance of enterprise regarded as labor system, defined as an object of type {X, H, S, F, Y}, where X - agricultural machinery (objects of labor); H - service workers (labor agents); *S* - The technical means (tools); Y - recovery (product safety); F - labor process as a result of which provided facilities operation Y X by H and S.

The challenge for quality rehabilitation formulate in a way, to find such X, H, S and F, at which:

$$Ry\ (H, X, S, F) \geq RdY;\ SY\ (X, H, S, F) \rightarrow min, \qquad (1)$$

Where: Ry (X, H, S, F) - functionality that characterizes the dependence of the probability of no errors service personnel during maintenance; SY (X, H, S, F) - functionality that characterizes the average costs of maintenance; RdY - the minimum allowable value Ry.

Quality management maintenance is changing the properties of system elements H, S and characteristics of the labor process F, where the purpose of the system Y remains unchanged, but change up the quality and value of Ry SY goal.

Quality ergatic functioning technical system depends on the correct maintenance planning and maintenance of security processes necessary

resources, performance and stability properties of the system intended to keep the process functioning.

Efficiency ergatic technical system (ES) is achieved through the quality of its functioning Fc, productivity, reliability to possible external influences system-level Zs technical status and control factors Xc:

$$Es = f\{Fc; Xc; Zs\}. \quad (2)$$

Performance indicators Fc dependent on the quality of performance of separate tasks and structure them Fz logical and temporal correlation with LC-:

$$Fc = \varphi\{Fzi, Hzi, Zzi, LC\text{-}W, Us\text{-}on, with\ US\text{-}\} \quad (3)$$

Where: HZ - controlled factors; Zzi - disturbances that affect the quality of the task; Uz - restrictions affecting the structure; US - driven factors structure.

Similarly, quality execution of tasks Fz depend on the quality of performance of certain manufacturing operations and Fo logical and temporal patterns of transactions Lz-in:

$$Fz = \gamma\{Foi, Hoi, Zoi, Lz\text{-}oh, UO, UO\} \quad (4)$$

Where: Hoi, Zoi - driven factors and disturbances that affect the quality of work; UO, UO - driven factors and constraints that affect the structure.

This scheme forming performance quality of the maintenance of such a fundamental features:

- level sensitive indicators for calculating Fi, allowing complex processes to dismember a simpler;
- separate the parameters and structure of the system enables both structural as well and parametric optimization;
- porivneve and disturbing account of factors allows managers to assess their impact on their respective scale level.

In accordance with the scheme (Fig. 2) we obtain the following estimates of indicators of quality of works on maintenance of agricultural machinery.

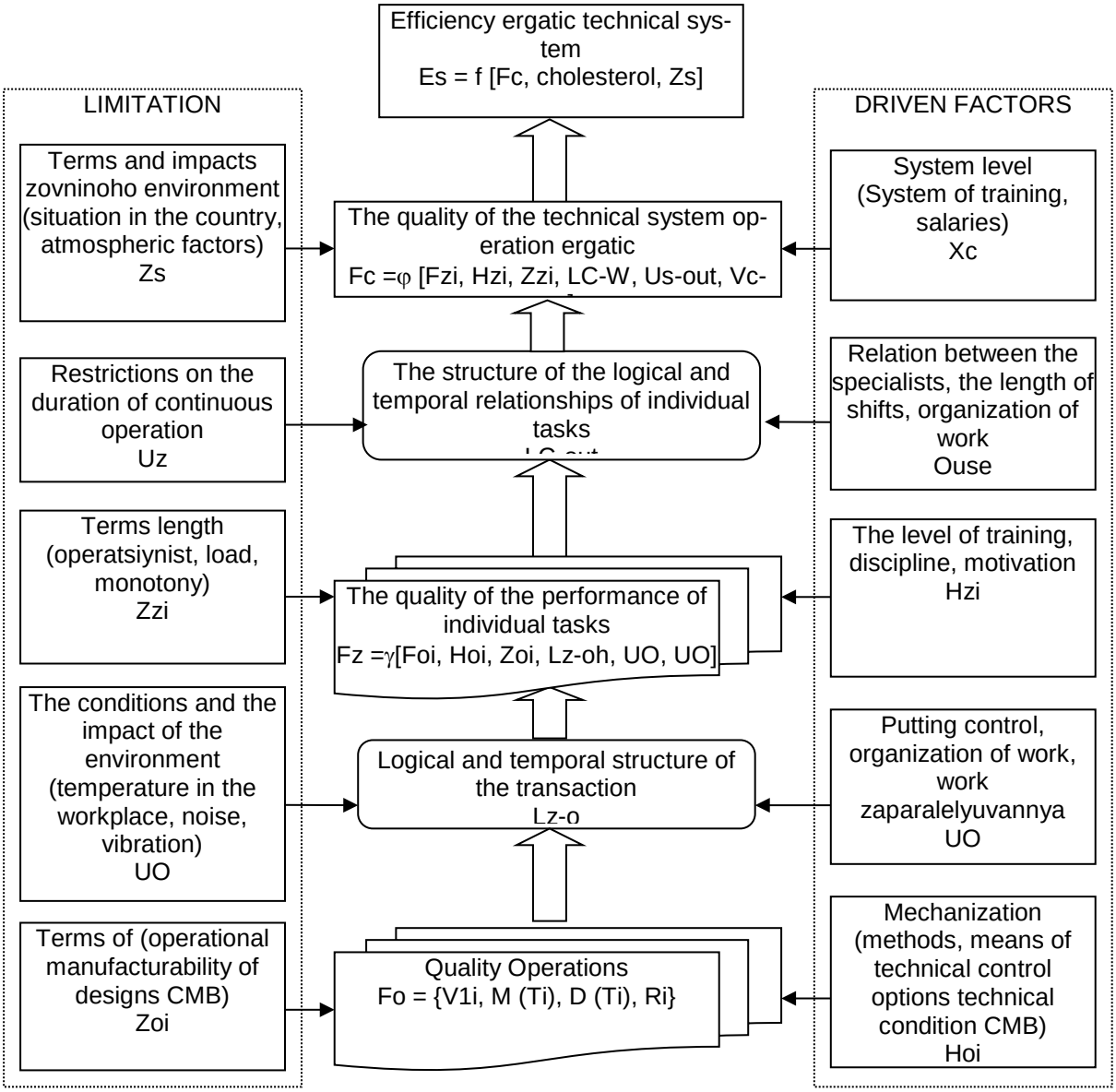


Fig. 2. Scheme of the formation of the efficiency and quality of processes of rehabilitation.

At the level of operations:

$$Fo = \{V1i, M(Ti), D(Ti), ri\}, \quad (5)$$

Where: V1i - the probability of error-free performance and th transaction; M (Ti), D (The) - expectation and variance runtime th and operations; ri - costs.

At the level of the problem:

$$Fz = \{P1z, M(TOR), D(TOR)\} \quad (6)$$

Where: P1z - the probability of error-free performance problems; M (TOR), D (TOR) - mathematical expectation and variance of runtime problems.

At the level of the system:

$$Fc = \{P1s, Q1s(t), U(r)\}, \quad (7)$$

Where: P1s - the probability of error-free solution to all problems facing maintenance organization; Q1s (t) - probability of timely solution of all problems; U (r) - the probability of sufficiency of resources allocated to solve problems.

K Quality of work depends on a number of components:

$$K = \varphi\{P(x), S, U, Y, Q\}, \quad (8)$$

where: P (x) - the possibility of work on maintenance in terms of X; S - readiness ergatic technical systems to perform maintenance; U - the timely start of operations; Y - the degree of progress of work on maintenance in terms of X (artist, applied technology, correctness, accuracy);

Logical and probabilistic model maintenance process is a directed graph that consists of two parts: A Decomposition and aggregation, decomposition is performed by the logic-temporal sequence of events, and the aggregation form or manifestation of the nature of the result (Fig. 3).

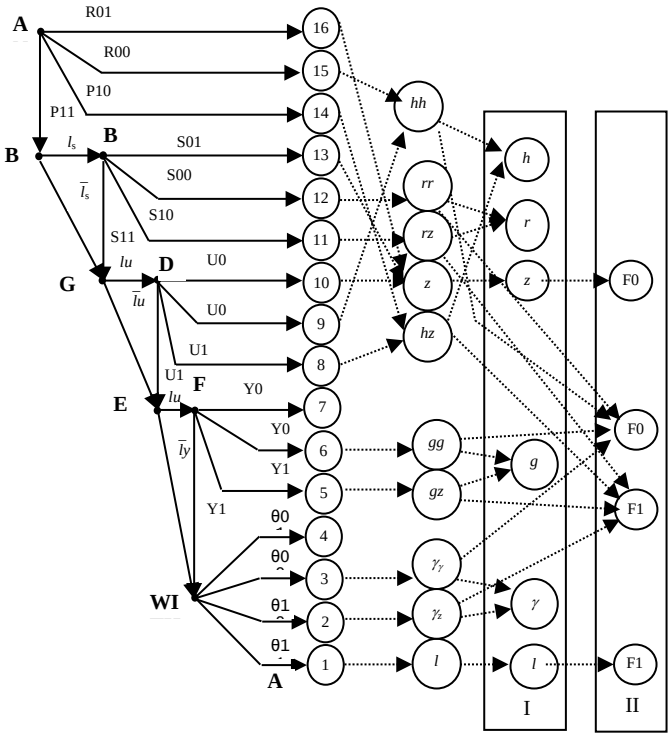


Fig. 3. Logical probabilistic model of rehabilitation processes agricultural machines.

Compliance with the requirements of a particular process (mismatch) labeled "1" ("0"). Is recognized (identified) as the right (wrong) performed process marked the second index "1" ("0").

In the study process, some of the components may be disregarded. For this model introduced Boolean variables and LI $\bar{L}I$Which indicate the presence of the model following her and function.

Vmistovne deciphering the resulting events: l - the successful

completion work together; γ_γ (γ_z) - Unsuccessful completion work together; z - completion of works from secretive defects; gg (gz) - interruption by detecting errors; rr (rz) - abandonment by manifestation structures-but-organizational failure; hh (hz) - delayed start maintenance.

In the aggregation model of association can be done in two ways: I - manifestation in form, in accordance with the above designations; II - the nature of the result of the process then resulted tsilomu.Na based model developed models of typical functional structures and works by mathematical formulas for assessing numerical values of the quality of work, Fig. 4 and Fig. 5.

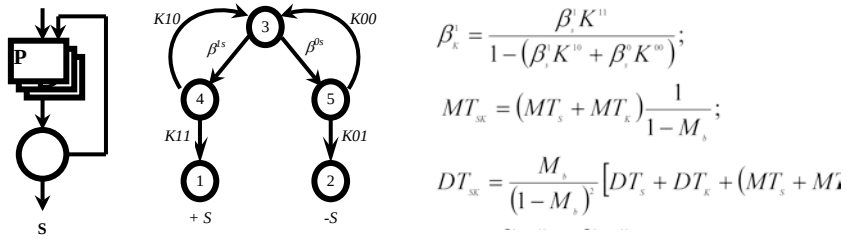


Fig. 4. Consistent implementation of complex manufacturing operations to control the accuracy of their performance.

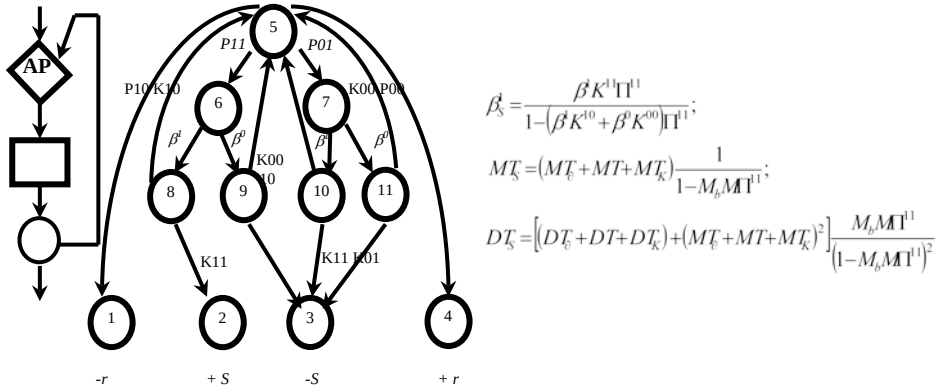


Fig. 5. Implementation of technological operations on the basis of the technical state of the control parameters to control the accuracy JMG operation.

The models (Fig. 4 and Fig. 5), based on the fact that the processes and maintenance of the system intended separated in time. Therefore, in these models is the urgent task of reducing the time of service, selection of optimal service points, etc. However, the process efficiency SGM technical control and analysis of the results of such monitoring and generate corrective actions take place in the determined mode.

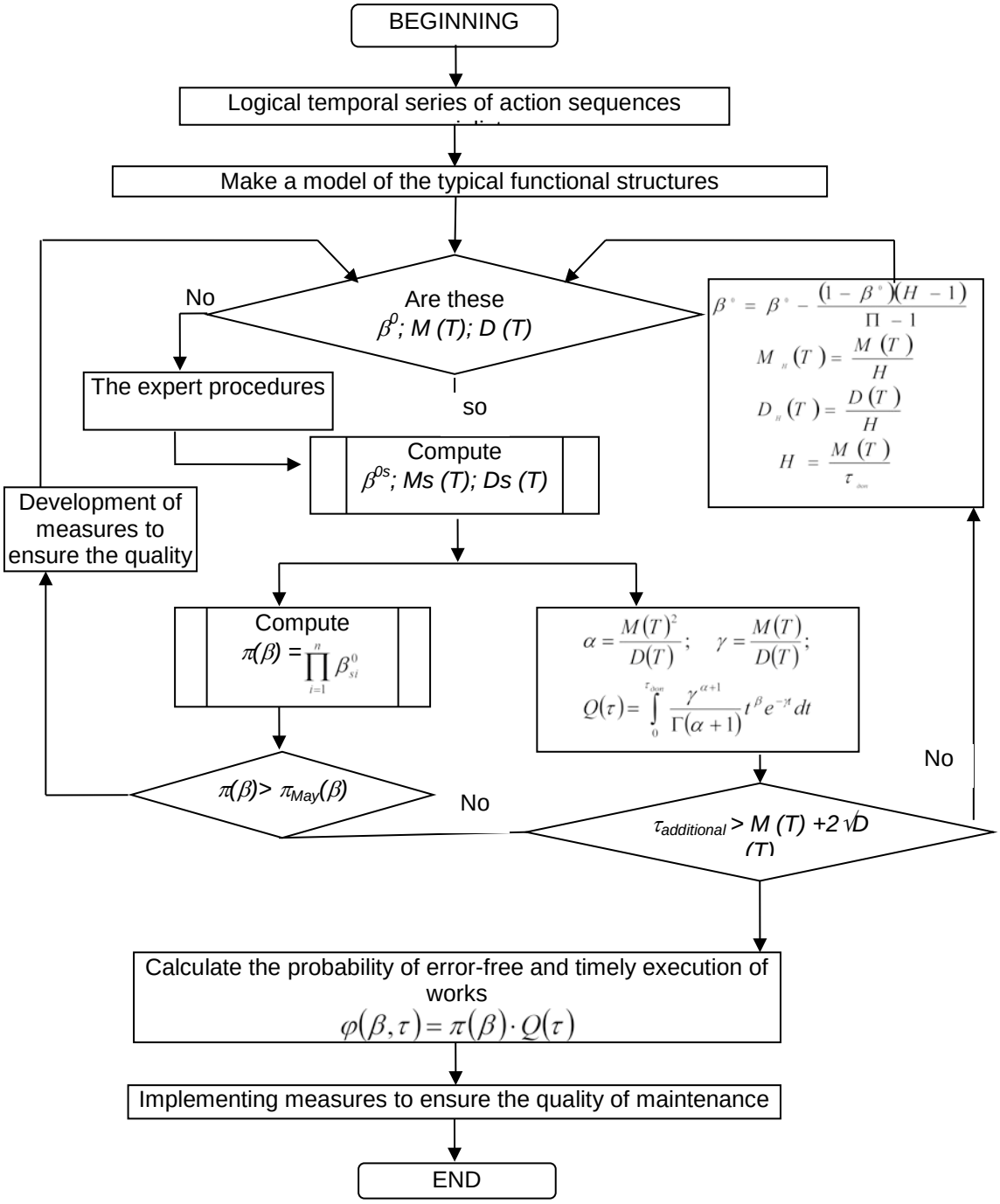


Fig. 6. The algorithm for determining quality of service of the employee.

Control process is largely automated and intellectualized. In such circumstances, highlights the need to address the problems of parametric optimization models of maintenance criteria for maximizing the performance of maintenance (eg posteriori probability of failure of JMG).

Therefore, the proposed control algorithms efficiency using a posteriori information on the current state of the controlled object and in most cases is not adaptive. Modern SGM equipped with advanced

means of collecting and analyzing information on the events of disability. These products operate in real time in the background information with high performance. On this basis, it is possible to implement adaptive model of rehabilitation, which make full use of information on changes in the state-controlled CMB (Fig. 6).

Conclusion. There disaster recovery strategies tend to boil down to finding the location of the defective item and its replacement is likely to defective from the reserve fund. But today ergatic technical structures characterized by relatively low value of the probability of failure of structural elements, which are at the stage of research equipment operation in many important practical cases may be neglected. Therefore highlights the need to address the problems that are associated with the development and optimization of procedures for the causes of failures in the operation of agricultural machinery.

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In this article solved methodological approach for stochastic Description Provision rabotosposobnosty agricultural machines.

Rabotosposobnost,machine,stochasticity.

In paper the methodigical approach to description of stochastic ensure efficiency of agricultural machinery.

Efficiency, machine, stochastics.

UDC 630.171.075.3

ANALYSIS FREQUENCY OF MAINTENANCE FORESTRY MACHINES TO WORK

LL Titov, a graduate *
IL Rogovskiy, Ph.D.

The article presents the results of methodical positions on a mathematical model describing the frequency of software maintenance machines for Forestry work.

Means, maintenance, frequency machine.

Formulation of the problem. On the length of stay of machines for Forestry work (further - cars) in non-working condition and the cost of maintenance and repair affects adopted a system to ensure their operational and resource exchange elements and materials, which includes the range, quantity, placement in storage, frequency and order replenishment latter.

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Analysis of recent research. In [1] developed a method to determine the optimal frequency of maintenance of machines for the criterion of minimum total unit costs:

$$C\left(t_i^{TO}\right)=C_O\left(t_i^{TO}\right)+C_{ПР}\left(t_i^{TO}\right)\rightarrow \min, \quad (1)$$

where: $C_O\left(t_i^{TO}\right)$ - Specific maintenance costs and eliminate failures; $C_{ПР}\left(t_i^{TO}\right)$ - Specific losses from idle cars.

The optimal frequency of maintenance is determined according to calculations made for different values of frequency, but it is related only to the costs and ignores the actual changes in the technical condition of vehicles.