identification of experimental and analytical method of heat treatment processes zernomaterialiv with sufficient accuracy for engineering calculations.

The use of thermal processes in the calculation of analytical mathematical models can use these models for a wide range zernomaterialiv and conditions of the heat treatment.

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Abstract.*Method is designed for determining teplofyzycheskyh koэffytsyentov a decision equation teploprovodnosty hranychnыh terms with Rod III эксperymentalnыh zernovky the heating kinetics data.*

Keywords: termoobrabotka grain teplofy-zycheskye koэffytsyentы, approximation, ALLOCATION topics-peraturы

Annotation.*Developed method of determining the physical characteristics in the heat equation with boundary conditions of three kinds of experimental data of kinetics of heating caryopses.*

Key words: heat treatment of grain, thermal coefficients, approximation, temperature distribution

STUDY OF DYNAMICS CHANGE reliability index for cooking and distribution of fodder

A. Novitskiy, Ph.D.

Abstract. *A study of the dynamics of change of indicators of reliability of the preparation and distribution of feed. Analytical dependence for determining the probability of failure of the system during the degradation of the machine and reducing the professional and psycho-physiological level operator.*
Keywords: tool, feed, reliability

Formulation of the problem. Reliability multioperational agricultural machinery, as complex technical systems depends not only on the excellence of their designs, but also on the professional level staff. Unstable conditions, the effect of the environment, reduce the influence of repair and servicing base to support the equipment in working condition, degradation of the machines, professional level, and psychophysiological operators significantly complicate the assessment of qualitative and quantitative indicators of reliability.

Analysis of recent research. For system reliability analysis of complex technical systems, "Man - Machine" (CCC "LM") using mathematical apparatus of Markov random processes, the work of Professor IA Ushakov, VI Nechiporenko [1, 2] proposed the introduction of additional fictitious states. As a result of these changes is complicated graph of states and transitions, but simplifies the mathematical tools of their determination.

As practice proves effective operation of facilities for preparation and distribution of food (ZPRK) depends not only on the level of reliability of the machines, but the professional level of the human operator. In recent years, scientific journals Ukraine were studies that examined: the issue of the reliability of agricultural machinery by improving the system of "Machine-base maintenance" [4]; methods of active and passive redundancy machines and separate units [3]; features ensure reliability of the process [6]. However, analysis shows that the works do not reflect the impact of human factors on reliability engineering, not taken into account subsystem "human operator"

which provides not only efficient use, but also to maintain efficiency machines.

The purpose of research is research that can determine patterns of changes in the probability of failure of ZPRK as CCC "LM". The main methods of research is mathematical modeling CCC "LM" on the basis of

the graph marked-building classes, obtaining stochastic differential equations balance of probabilities.

Results. The problem of determining the probability of failure of ZPRK as CCC "LM" in terms of technology obsolescence and reducing the level of professional service, dedicated to a number of studies. Graphic description of the behavior of complex technical system under these operating conditions are presented in the graph labeled [5] and shown in Fig. 1.
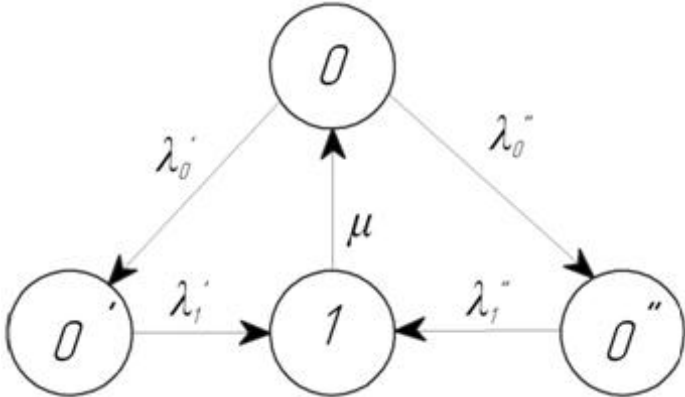

Fig. 1. Count the states and transitions CCC "man - machine".

Based on the count built probabilities for states and transitions of the system "LM" composite dynamic balance differential equations:

Characterize shown in Fig. Count 1, following description states: $P_0(t)$ - The probability of system stay in working condition; $P_0'(t)$ - The probability of system stay in the intermediate state (fictitious state) - "aging" of the machine; $P_0''(t)$ - The probability of system stay in the intermediate state (fictitious state) - reducing the efficiency of the operator; $P_1(t)$ - Likely to stay in the system inoperable; $\lambda_0', \lambda_0'', \lambda_1', \lambda_1''$ - Failure rate; μ - The intensity of updates.

Decisions of the system of differential equations (1), which was obtained in [5], involves the use of Laplace transforms, replacing the second equation normalizing condition and a number of changes that can determine the unknown under the rule Kramer. After a series of transformations Analytical dependence for determining the probability of failure of CTC "LM" at any time t in the accumulation of damages:

$$P_0(t) = \frac{\lambda_1'\lambda_1'' + \lambda_1''\mu + \lambda_1'\mu}{S_3 S_4} +$$

$$+1 - \frac{\lambda_1'\lambda_1'' + \lambda_1''\mu + \lambda_1'\mu}{S_3 S_4.} - \frac{-(\lambda_1'' + \lambda_1' + \mu) - S_4 + \dfrac{\lambda_1'\lambda_1'' + \lambda_1''\mu + \lambda_1'\mu}{S_4}}{(S_3 + S_4)} \times$$

$$\times \exp(-S_3 t) + \frac{-(\lambda_1'' + \lambda_1' + \mu) - S_4 + \dfrac{\lambda_1'\lambda_1'' + \lambda_1''\mu + \lambda_1'\mu}{S_4}}{(S_3 + S_4)} \exp(-S_4 t). \tag{2}$$

The component S_3 and S_4 can be determined from the equations (5) and (6) that were considered in the study [5]. To set depending on the probability of failure of CTC "LM" only on the failure rate and intensity restorations replacement roots hold S_3 and S_4 their value (5) and (6) of [5]. Therefore, after appropriate mathematical transformations to obtain a final analytical dependence to determine the probability of failure-free operation as follows:

$$P_0(t) = \frac{\lambda_1'\lambda_1'' + \lambda_1''\mu + \lambda_1'\mu}{\lambda_0'\lambda_1' + \lambda_0''\lambda_1' + \lambda_1'\lambda_1'' + \lambda_1''\mu + \lambda_1'\mu + \lambda_0''\mu + \lambda_0'\mu}. \tag{3}$$

For practical realization of particular interest not only to determine the probability of limiting host system in one of the states in terms of assessing its reliability, but also the dynamics of indicators of reliability during its life.

We conducted a study of facilities for preparation and distribution of feed in operation during the 2012-2014 years. Over the specified period been recorded between failures and mean time recovery ZPRK, calculated failure rate and intensity of updates.

Using analytical dependence (3) and important failure rate and intensity updates that were obtained under operating conditions, we studied the dynamics of change in the probability of failure of ZPRK. The resulting tracker dynamics of the probability of failure of ZPRK shown in Fig. 2. The analysis of changes in the probability of failure-free operation ZPRK failure rate shows that the greater part of the value is characterized by "man - operator". Found that after 200 hours of ZPRK corresponding to the failure rate of 0.005 1 / h, probability operator will be 0.88. In the same period, the probability of failure of the machine will be 0.74.
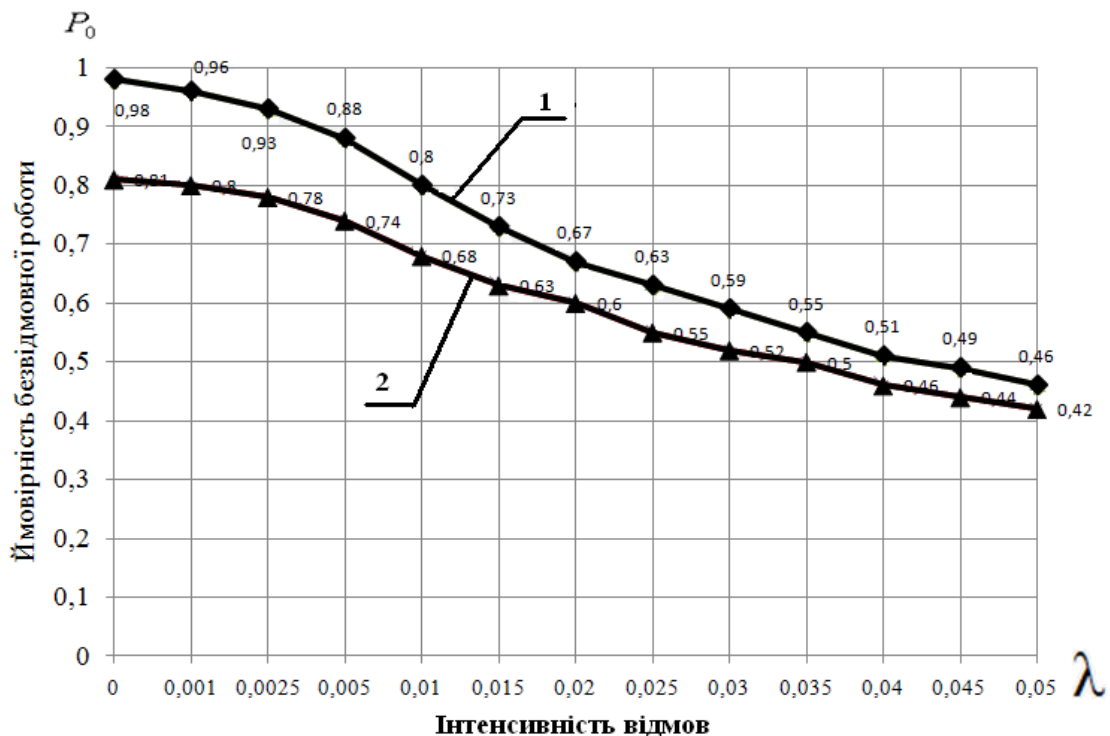
Fig. 2. Graph of the probability of failure-free operation ZPRK 1 - failure rate of the human operator; 2 - failure rate of the machine.

Dynamic reliability characteristics graph marked-up states are useful material regarding the rational choice of research direction to ensure the reliability ZPRK.

Conclusion. On the basis of research analytical dependences for determination of the reliability ZPRK as CCC "LM". The resulting tracker allows you to explore the changing probability of failure of means for preparation and distribution of feed during the "aging" of the machine and reducing professional psycho-physiological level operator.

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Abstract. *A Study dynamics Changed reliability of indicators and the means for pryhotovlenyya razdachy fodder. Poluchena analytycheskaya dependence for probability definitions bezotkaznoy work system in the period of technical uhudshenyya STATUS mashiny Reduction and PROFESSIONAL and psyhofyzyolohycheskoho urovnja operator.*
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Annotation. *The investigation of dynamics of change of reliability indices of funds for preparation and distribution of feed. The analytical dependence for determination of probability of failure of the system during the «aging» of machine and reducing professional and psychophysical level operator.*
Key words: tool, feed, reliability

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ANALYSIS ONION CULTIVATION TECHNOLOGIES AND DESIGN FEATURES OF THE EXPERIMENTAL SETUP FOR DIGGING

LI Marinina, Ph.D.

DNU "Ukrainian Institute of forecasting and test equipment and technologies for agricultural production named Leonid burned"

Abstract. The article presents graphs technologies of onion and a description of the experimental setup for the digging of vegetable crops.

Keywords: onion, graphs technologies, experimental setup, dolotopodibnyy working body, digging

Formulation of the problem. The main task facing the agricultural sector of Ukraine is to provide the population with food, including vegetables. Among vegetables, onion cultivation area occupies about 14%. Despite the specialization of farms and ownership, labor hours for growing onions are large, with more than 60% of manual labor and 50% of energy consumption accounts for work associated with its collection