

ENSURING RELIABILITY OF COMPLEX SYSTEMS BY OPTIZATION OF TIME TECHNOLOGICAL CHAINS

Konoplianchenko Ie., Ph.D, Assoc. Prof., Kolodnenko V., SNAU, Sumy

In modern industrial conditions different operations are carried out in different conditions, and consequently, with their various duration. Operation synchronization at large engineering distinction of producing items is especially difficult and in many cases even impossible. At different duration each pair of adjacent operations absorbs or accumulates stock, if it is not available item storage or equipment standstill will be observed. Stock storage needs interpreting stores. However, store using essentially contradicts the requirement of manufacture continuity because the industrial areas and production cycle duration increase.

Time of running a production process is production cycle characterized by length of, idle time values of equipment and wait time of parts in the production. All three features, in particularities two last, powerfully hang from the value of maximum length of one of the operations, from average length of all operations and from degrees of asynchronous length of operations. Changing an organization of moving the products during constantly brings about one and same results: changes a total idle time values of equipment, changes duration of production cycle, and changes a total wait time of items that brings about work-in process change. The analysis of time structures of technological processes has allowed choosing typical structures, which are appropriate to various kinds of specialization of manufacture. The interrelation of time, reliability and cost parameters is considered and the ways of optimization of time technological chains are specified.

Our team is designed standard time structures. This structure-modulas are programmed on the certain economic effect, which value depends on amounts of production restrictions and spectrum to realization a structure on the concrete enterprise. Elements are presented by mathematical models, for the determination of output parameters which designed in algorithm and software. Using these modulas possible to decide a direct problem. To lead a rational technological system building, on output which it is necessary to get a given economic effect. As well as decide inverse problem to define a potential of existing structure and indicate ways of optimization. For rational organization of production must together assess the impact of all the process time elements, economic performance and reliability of operation, due to the effects of minimization.

The practical significance of the results is that the method of synthesis of rational choices assembly of technological processes, allowing production in preparation categorize existing time structures options and to determine through rational designed algorithm. Using mathematical models of equipment downtime and inter-operation time lying on the basis of standard time structures, there is the ability to predict the effect of the operation of the building system under real production conditions, taking into account the dynamics of the process of drafting.

Наукове видання

**СИСТЕМИ РОЗРОБЛЕННЯ ТА ПОСТАНОВЛЕННЯ
ПРОДУКЦІЇ НА ВИРОБНИЦТВО. ІНДУСТРІЯ 4.0.
СУЧАСНИЙ НАПРЯМОК АВТОМАТИЗАЦІЇ
ТА ОБМІНУ ДАНИМИ У ВИРОБНИЧИХ ТЕХНОЛОГІЯХ**

Матеріали II Міжнародної науково-практичної
конференції

(м. Суми, 22–26 травня 2017 року)

Відповідальний за випуск К. О. Дядюра
Комп'ютерне верстання: Ю. Ю. Куцомеля, Х. В. Берладір

Стиль та орфографія авторів збережені.

Формат 60x84/16. Ум. друк. арк. 11,39. Обл.-вид. арк. 12,14. Тираж 100 пр. Зам № .

Видавець і виготовлювач
Сумський державний університет,
вул. Римського-Корсакова, 2, м. Суми, 40007
Свідоцтво суб'єкта видавничої справи ДК № 3062 від 17.12.2007.