METHODICAL BASES FOR OPTIMIZATION OF ADDITIONAL STOCKS OF MATERIAL RESOURCES IN THE SYSTEM OF LOGISTICS

Borys O. Demianchuk, Military Academy, Odesa (Ukraine). E-mail: bademyanchuk@ukr.net
Viacheslav M. Kosariev, Alfred Nobel University (Ukraine). E-mail: ut5ex@ukr.net
Viktor A. Makhankov. Military Academy, Odesa (Ukraine). E-mail: mva1949@ukr.net
DOI: 10.32342/2616-3853-2018-1-11-2
Key words: ***logistics, stocks, material resources, technical condition, optimization, model, management.***

The conditions of considerable random, natural and antagonistic uncertainty require the solution of a specific problem of inventory management to ensure the continuous operation of a complex system. An example is the expected combat or production losses and costs, namely, the need to replenish stocks of material resources of all kinds, especially food, ammunition of a military unit and components for the production or repair of equipment, petroleum products and lubricants.

The problem is that the creation of stocks at the preparation stage, for example, operations, their replenishment at the stage of the operation requires significant both material costs and time-consuming. These delivery time costs, as a rule, due to the actions of the enemy and damage to communications, far exceed the time required to replenish stocks in preparation for the operation. On the other hand, too large reserves, made before the start of intensive losses and costs associated with the risk of their loss before the start of the main actions.

The proposed methodological basis for optimizing the volume and time of placing additional stocks of material resources in the logistics system: the provision of services; production; defense purposes, in the face of uncertainty of the random and antagonistic type.

In practice, such optimization tasks have to be tackled not only by employees of the Ministry of Emergency Situations, but also by representatives of volunteer organizations, and heads of public organizations, and the military logistics management, and military commanders.

A large number of well-known publications contain a fairly effective apparatus, methods for optimizing various processes that are important for practical use. But they often talk about finding the extremum of a function of a continuous argument.

The solution of the optimization problem in this paper requires the search for the extremum of a function of a discrete argument. That is what makes it necessary to use the method of discrete optimization. Such a solution of the problem gives a result that is more adequate in relation to the real conditions of the practice.

The general results obtained in this way can also be the basis for conclusions about the viability of the system for ensuring the grouping of consumers as a whole, and for determining rational ways to significantly increase the viability of the providing system.

References

1. Kratzke, A.W., Ganger, J. (1979). *Cost optimization subject to availability constraints*. Proc/ Annu. Reliab. and Maintainability Symp. Washington, New York, pp. 73-78. Abstract in: *Ekonomika promyshlennosti* [Industrial economics], 1980, no. 2, p. 52.

2. Murthy, D.N.A. (1979) *A stochastic moidel for technology forecasting*. Technol. Forecast. and Soc. Change, no. 14 (1), pp. 27-37. Abstract in: *Ekonomika promyshlennosti* [Industrial economics], 1980, no. 1, p. 63.

3. Basic Models (1976). Technol. Substit. Forecast. Techn. and Appl., New York e.a. Abstract in: *Ekonomika promyshlennosti. Primeneniye matematicheskikh metodov v ekonomicheskikh issledovaniyakh i planirovanii* [Economics of industry. The use of mathematical methods in economic research and planning], 1980, no. 2, p. 27.

4. Wild D.J. (1967). *Metody poiska ekstremuma* [Extreme search methods]. Moscow, Nauka, 267 p.

Одержано 21.08.2018.