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DEVELOPMENT OF A LOGICAL CONCLUSION METHODOLOGY BASED ON A NETWORK MODEL OF THE MANUFACTURING PROCESS OF A DECISION ON THE PURPOSE OF FIREARMS FOR AN AIR TARGET

The management process involves solving a certain sequence of tasks. Decision-making process on the appointment of firearms of air defense units for the destruction of air targets includes the following tasks: logical and analytical, calculation, selection tasks. When using a cognitive approach to the automation of these tasks, the methods of their solution can be as follows: logical conclusion based on a formalized model of decision-making processes about the appointment of fire weapons of air defense units for air targets, implementation of calculation algorithms based on known mathematical methods and techniques; solution or recognition problems and others.

The decision-making process on the purpose of firearms of air defense units for the destruction of air targets is a chain of logical conclusions with solution of calculation and algorithmic problems. In the network model of target installation, logical vertices “AND” and “OR” are used to present knowledge about management goals, which allows you to formalize tasks only of a logical nature.

To formalize knowledge about the processes of solving tasks of an algorithmic and calculation nature, there is a need to expand the descriptive capabilities of the network model of target installations by introducing new vertices. At the same time, the original network model is experiencing certain changes. It is proposed to additionally introduce the following vertices:

algorithmic vertices – are vertices that determine the need to solve subtasks using known methods. The procedure, which ensures the solution of problems of this class, realizes some algorithm or logical output on the network;

comparison vertices – are vertices that determine the need for an operation to compare the result and the previously known (expert, reference).

Solution search tasks consist of defining the hierarchy of vertex values by levels until the top-level vertex value is obtained. The process of assigning certain values to vertices will be called “marking”. By the marked vertex, we will mean the vertex for which the corresponding procedure is implemented, and the result is written in the memory of the computer.

The definition of vertices of different types has its own characteristics. Thus, the initial conditions receive values that are entered by the person who makes decisions (PMD), or that are transmitted to the algorithm for finding a solution with the call of procedures. The definition of search vertices consists in assigning search results (value of a certain field or a aggregate value defined by a given search space).

The definition of algorithmic vertices involves the launch of procedures that implement some algorithms, which allows you to calculate a certain value. The definition of vertices by comparison, “AND” and “OR” vertices, consists in assigning them one of two values: “truth” or “false”, depending on the results of determining the peaks of the lower levels.

The following method of finding a solution at each level is proposed:

definition of a set of realized vertices;

definition of vertices type;

definition of the procedure for determining vertices;

definition of procedure parameters;

definition of the vertices of the lower levels of the hierarchy, the result of which is taken as the value of parameters;

search for the results of the definition of vertices-parameters.

If all the vertices-parameters are defined, then the considered vertex is realized. The result of determining the vertex of the maximum level of hierarchy is the result of solving a logical and analytical task.