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ANALYSIS OF STABILITY AND SAFETY OF TECHNICAL SYSTEMS THAT GOVERN OPERATOR

B. Draganov, V. Demchenko

Stability and reliability of technical systems is an important task. This is especially true today, when used in all areas of computer technology and increasingly are used nanotechnology, intelligent control systems.

The purpose of research - Methods for the assessment of knowledge and skills of the operator of technical systems taking into account the probability of the analyzed phenomena.

Materials and methods. The degree of right or wrong decisions made by the operator can be determined on the basis of mathematical modeling

Analyzed situation can be divided into two groups: regular and irregular. In this case, an overall assessment of the decisions taken can be expressed as a Boolean function.

The data can be represented as a matrix of incidence, the line of which consists of the solutions obtained in the form of two parametric functions (1, 0), and the columns - reflect the individual sections of the area. It is thus possible to determine which sections of preparation of students was the most weak.

The results of research. From our point of view, it deserves the attention level of the operator both in theoretical and practical field of knowledge. We assume that the level of performance of all work is evaluated by the point system, which is reflected in the form of a matrix estimates.

Information on the activities of the unit operator and the adequacy of the optimal solution can be represented as a matrix Tm • n. Similarly, the practical activities of the operator can determine the matrix Fri • n.

The index, meaning the dimension of the matrix Tm • Fr • pi n, the symbol m denotes the number of rows and n - columns. We can assume that Tm • Fr • pi n express, respectively, tests of knowledge and skills.

• Matrix Tm n and lim • n can be represented in a dimensionless form, respectively, τij and πij. In this case, you can use the well-developed apparatus of the theory of matrices and matrix analysis of complex systems.

Number τi, j includes not only information about the complexity of this task, but its index (i, j), which corresponds to a certain base of knowledge from the source of the information environment.

Skills matrix Π = (πij) is formed in the same way that the knowledge and the matrix T = (τij). It is assumed that the information section of the shell contains scientific and practical software, a set of guidelines and objectives for each of the (i, j) - the complexity of the tasks πij, which must decide the operator when testing their knowledge in practice.

In the process of learning each task complexity τij πij operator and put the result in the form of a response to the action, assessed on a points system, designated further as tij and nij.

The magnitude of the assessment is influenced by many both objective and subjective factors, including the health of the operator, the weather, the ability to navigate the environment, finding the answer when time is short, the state of the examiner or the form of the question, if the test computer, etc.

Therefore, assessment of knowledge and skills have a greater or lesser degree as a component of non-random and random. As a result, the relative magnitudes of the dimensionless estimates are also random.

If each of the possible values of the relative responses to deliver according to the probability of its occurrence, instead of matrix relative response is received matrix of probability of correct answers, characterizing the level of training of each specialist.

Conclusions

The above method allows a reasonably determine the level of skill of the operator both in knowledge and in the ability of its activities.