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DEVELOPMENT OF THE METHOD OF ANALYSIS AND HYBRID SIMULATION MODELING

OF COMPLEX TECHNICAL SYSTEMS OF VARIABLE STRUCTURE

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Abstract. The article describes the method of analysis and hybrid simulation of complex technical systems of variable structure (CTS VS), which includes: collection and generalization of information about the STS SS; selection of clusters and elements of CTS VS and identification of their significant indicators; creation of a logical model of CTS VS; substantiation and selection of mathematical models for constructing a simulation hybrid model of CTS VS; construction of mathematical models of various types to describe all components of the CTS VS and assessment of the reliability of modeling clusters and elements of the STS of the PS using the constructed mathematical models; formation of the structure of the simulation hybrid model of the CTS VS based on the combination of the constructed mathematical models and structural and parametric adjustment of the relationships between mathematical models in the simulation hybrid model of the CTS VS monitoring of the state of clusters and elements of CTS VS, structural and parametric tuning and changing the types of mathematical models.

The aim of the work is to develop a method of analysis and hybrid simulation modeling of CTS VS.

The novelty lies in the fact that the proposed method is focused on the features of the CTS VS of the class under consideration in conditions of incomplete information, different-quality data on the state and functioning of the CTS VS, differs from the known ones by combining the capabilities of analytical, analytical-statistical and simulation approaches to building simulation hybrid models of the CTS VS, allows you to adapt to changes in systemic and external factors, improve the accuracy of modeling, and also typify the presentation of characteristic situational features for effective management of CTS.

Keywords: complex technical system of variable structure, hybrid simulation model, systemic and external factors, clusters, mathematical models, situational features, ventilation system of coal mines

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