**ABSTRACT SAMPLE**

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**THE PRINCIPLES OF CONTROL WITH MINIMAL ENERGY IN CONDITION OF UNCERTAINTY**

The branching processes are the most difficult types of technological processes. The problem of effective management of such processes is actual because of their prevalence in various fields of industry, business process management, agriculture and etc. The peculiarity of such processes management is that at the end of any transaction of this process the decisions are made regarding transition to the next stage and selection process branch in the point of branching. Decision-making is carried out in a combined stochastic, fuzzy and interval uncertainty conditions of the process implementation [1,2]. New problems in the management of branching processes emerged by the need to save energy on all phases of management: from receiving information about process state to making and implementing decisions. Reducing uncertainty is associated with the energy spending to receive information and make decision. Problem of constructing of optimal algorithms and multi-step decision-making for reducing energy spending in condition of combined uncertainty is not enough studied which reduces efficiency of such processes.

Problems of energy saving technologies of information processing development are becoming more and more important part of a comprehensive scientific and practical direction in the world under the title «Green IT». The theme of energy saving is one of the most cited in scientific and business conferences in recent years, such as: «IT Future», «Fujitsu Siemens Computers», «Cebit». Intel, Google, Hewlett-Packard, Microsoft, Lenovo, Dell and others joined under the slogan "Slow down global warming". However, *the problem of effective and energy-saving management of branching technological processes in conditions of uncertainty is new*. Energy savings, and in particular energy-saving decision-making control systems would become a prerequisite for promoting technical solutions to the market in the coming years.

**Objective:** To improve efficiency and energy-saving characteristics of branching technological processes (BTP) management in conditions of uncertainty through the development of theories, models, methods and means of multi-step decision making and coordination in distributed systems.

The approach to problem solving involves the use of the Bellman principle and uncertain graphs as models of BTP and search for the optimal path in the graph as BTP implementation plan after each operation. The news in this approach is the decomposition of each graph node representing a state of BTP to sub-processes of control, decision-making and implementation, to evaluate the energy consumption at each stage as components of risk criteria (average losses).

The methods of multi-parametric optimization are applied when solving the problem of finding the optimal control, and one of the criteria is the energy consumption to make and implement decisions. To account different types and sources of uncertainty generalization of presentation of reliable, stochastic and fuzzy data about process characteristics was made using generalized uncertainty function *β* and use of this presentation for generalized risk definition as the criteria for optimal decision making:

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where - energy consumption to measure parameters of BTP state, decision making and implementation of management respectively. There is a relationship between the variables :



**List of references:**

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2. Efficient Resources Allocation in Technological Processes Using an Approximate Algorithm Based on Random Walk / M.M. Bayas, V.M.Dubovoy // International Journal of Engineering and Technology (IJET) Vol 5 No 5 Oct-Nov 2013 p 4214-4218