

ABSTRACT

Master's Dissertation: 100 pp., 13 fig., 22 tables, 76 sources, 1 appendixes.

Relevance. For the world, the issue of energy conservation is very important. There are many areas of industry for whose production capacities, the existing amount of energy is not enough, therefore it is necessary to optimize production to minimize the amount of energy used. As you know, tasks in which it is necessary to minimize energy costs attract huge attention of researchers from around the world. This interest is associated with the rapid growth of industry and their production capacities, as well as with the rapid development of computer technology, allowing to accelerate the solution of problems through the use of additional energy. But high production growth rates lead to excessive use of energy, which in turn contributes to increased costs for enterprises. Therefore, there is a need for energy-efficient production schedules, will help reduce financial costs and prevent the global world problem of excessive use of non-renewable energy resources.

In this regard, it is urgent to develop a software product for compiling energy-efficient schedules by parallel machines with variable productivity, which will reduce the total energy use during work.

Relationship with working with scientific programs, plans, topics. The work was performed at the Department of Automated Information Processing and Management Systems of the National Technical University of Ukraine «Igor SikorskyKyiv Polytechnic Institute» within the topic «Effective methods for solving the problems of scheduling theory»» (No. DP 0117U000919).

The purpose of the study is to increase the efficiency of production systems by drawing up optimal or close to the optimal by energy criterion of work plans with minimization of the total amount of energy used in parallel devices.

To achieve this goal, you must complete the following **tasks**:

- perform an analytical review of existing planning systems, scheduling models, scheduling methods, production and operational scheduling systems;
- develop a method for solving the problem of compiling an energy efficient schedule when performing work on parallel devices;
- investigate the effectiveness of the developed method of scheduling;
- develop software implementation of the developed method;
- carry out an experimental study of the results obtained.

The object of study is the operative-calendar planning of the enterprise.

The subject of the study is the energy efficient scheduling for current calendar planning.

Scientific novelty of the obtained results

The algorithm for compiling energy efficient schedules in operational - scheduling has been developed. The created algorithm allows to reduce the amount of energy used during production by minimizing the density of time intervals.

Publications.

The materials of the work were published in the abstracts of the 14th International Scientific and Practical Conference "MODS 2019" [1]. Proceedings of the Third All-Ukrainian Scientific and Practical Conference of Young Scientists and Students "Information Systems and Technologies of Management" (ISTU-2019) [2]. The article was published in the journal «Bulletin of Vinnitsa Polytechnic Institute» [3].

ENERGY EFFICIENT TASK, SCHEDULE CREATION, NON-RENEWABLE RESOURCE, CALENDAR PLAN, PARALLEL MACHINES, MINIMIZATION OF TOTAL RESOURCE USAGE, SCHEDULE DATE.