WYDZIAŁ MECHANICZNY TECHNOLOGICZNY
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PRACA DOKTORSKA

PLANOWANIE ZADAŃ W SYSTEMACH NIEJEDNORODNYCH W WARUNKACH OGRANICZEŃ DETERMINISTYCZNYCH

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PLANNING TASKS IN NONHOMOGENOUS SYSTEMS IN CONDITIONS OF DETERMINISTIC CONSTRAINTS.

Key words: non-homogenous system, planning, scheduling

The aim of the work was to develop a procedure to be followed in small and medium-sized companies operating under conditions of non-rhythmic and non-repeatable production. A system in which MTS, MTO and ETO tasks are carried out concurrently, referred to as a non-homogenous system, has been considered. Particular types of tasks have different priority indicators. Processes involved in the implementation of these tasks are dependent processes, which compete for access to resources.

The work is based on the assumption that the developed procedure should be a universal tool that can be easily used by planners. It should also eliminate the intuitive manner of prioritizing tasks while providing a fast and easy to calculate way of obtaining an answer, i.e. a ready plan or schedule. As orders enter the system on an ongoing basis, the created plan and schedule should enable fast analysis of the result and make it possible to implement subsequent orders appearing in the system.

The investigations were based on data from the non-homogenous production system functioning at the Experimental Plant of the Łukasiewicz Research Network – Institute of Ceramics and Building Materials, Refractory Materials Division.

The developed procedure includes the following steps:

1 – Initial estimation of resource availability
2 – MTS tasks planning
3 – Production system capacity analysis
4 – ETO tasks planning
5 – MTO orders planning
6 – Evaluation of the obtained schedule.

The scheduling procedure is based on KbRS (Knowledge based Rescheduling System), which has been modified in functional terms for the needs of the dissertation assumption.

The obtained schedule evaluation indicators, i.e. timeliness of task implementation, confirmed the effectiveness of the proposed methodology. The research will be continued so as to optimize the effectiveness of resource use in non-homogenous systems. It can be done by grouping similar orders, and, in consequence, reducing the preparation and finishing time in the total resource usage.