Abstract

In the doctoral dissertation a try was made to identify the main problems that link the condition of the machines with the quality of products in the company. In addition to the important issue of the functioning of a knowledge-based enterprise and innovative methods used in the assessment of production quality, issues in the area of rational use of machines in terms of use and handling were distinguished, with the distinction of machine diagnostics. Machine diagnostics plays an increasingly important role as a control element in the operation process, as it is an integral part of the operation strategy according to the state that effectively displaces the previously used plan and preventive strategy.

The main problem of the dissertation is to improve the maintenance of machines in airworthiness by extending the possibility of vibration diagnostics of the main machines of the technological process, which translates into the quality of the plant's products. Recognition of the structure and tasks as well as the technological process of the plant gives reasons for the locations (facilities, machines) of the applications of the diagnostic procedures developed.

Taking into account the above mentioned research problem, the main objective of the work was formulated: "Development of a production quality control system based on a modern machine operation system using virtual techniques in procedures supporting machine maintenance, for creative organizational and diagnostic activities in the enterprise". Achieving the main goal and specific objectives assumed in the work was possible thanks to a systematic review of the literature and empirical research. For the needs of the research assumptions, the research model was developed.

The final effect of the presented work are the defined procedures for innovative principles of an effectively functioning enterprise operation system, taking into account the creative processing of diagnostic information and improving the principles of rational management and creative thinking, using virtual technology elements in maintaining the fitness of machines.

The doctoral dissertation has a total of 244 pages and includes an introduction and 7 substantive chapters, a summary and conclusions, and a list of literature. The work in the main part contains a large number of tables and drawings, a list of 190 literature items and summaries in Polish and English.