

Streszczenie pracy w języku angielskim

Technical Objects Maintenance Process Designing on the Example of Selected Tramcars

Summary

The problems of conceptual preparation of the process of complex renewable technical objects maintenance were addressed. In the introduction, the genesis of the issue under consideration was described as well as the scope and main aim of the thesis, which is the development of analytical methods and pragmatic guidelines supporting tramcars maintenance processes planning, including a complex renewable technical objects maintenance processes designing method.

The paper presents the problem of operation and maintenance of technical objects defined as an action of their usage in order to satisfy human needs. Within the described action, the processes of using and maintaining were located. The maintenance process, which is the object of interest in the thesis, was characterised as a set of actions referring to the support and restoration of the operational state of a technical object. The following chapters analyse system and process (action realisation process) concepts, as well as selected formal models applied to the operation and maintenance of technical objects: the system model, the praxiological model and the cybernetic model. The system operator was also characterised as a tool incorporating a combined system and process approach to problem solving. The concepts of reliability and durability of technical objects and selected mathematical models of reliability theory and renewal theory, which are of practical importance during maintenance planning, have been presented. The problem of managing the operation and maintenance processes based on relevant data on their current course and the design methods used in the development of new solutions of objects, systems and processes have been broadly characterised. Thorough analysis was performed on the maintenance process of NGT8 tramcars, which is conducted in the Municipal Transport Company in Kraków, as well as on the construction of such tramcars (in the selected scope of the analysis). In these circumstances, the selection of the research object which is the wheel tyre of the NGT8 car was presented as well as the problem of this type of tramcar parts testing. A statistical analysis of the data on the operation and maintenance of NGT8 tramcars wheel tyres was performed. After the appropriate assumptions had been made, the proper functioning of the developed analytical tool was verified. The successful application of the tool led to the determination of the values of mileage preceding the technical inspection of the tyre of the vehicle wheels.

The thesis presents the process of synthesis of the complex renewable technical objects maintenance designing method as a methodological problem of practical importance. The method organises the use of the developed tools, which were characterised in detail. The number of chapters also cover the general-purpose models, which are the universal solutions that can be used during designing the process of complex renewable technical objects maintenance. The thesis includes four sets of conclusions which regard to the methodically conducted research and analysis, the analysis of the examined maintenance process, the problems related to methodology of maintenance processes designing and the possibilities of further research and design works, as well as the lists of literature and attachments.

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