## 12. ABSTRACT

Along with the significant increase in the requirements for sewerage systems in urban catchment areas and the increase in the public's environmental awareness, the operation of sewerage networks is becoming increasingly demanding and must cover a wide range of issues related to i.a. acquisition of operational data, its analysis and the resulting management and operation optimisation.

The aim of the research was to develop and implement tools to support systemic management and day to day operation of sewerage systems in the form of a system of registration and codification of operational activities including an event dictionary, which takes into account the needs of the department's management, adapting the management model, optimizing and analyzing the implemented processes.

The subject of the research was a sewerage system managed by JEZS in agglomeration X, of an administrative and industrial nature and LM> 150 thousand. The dissertation characterizes the analyzed sewage network (age, material, dimensions structure), the management model and the structure of the network resource management department (JEZS). The concept of the registration system developed by the author consisted of the implementation of an integrated system based on an extensive database, containing codified data on the operation of the sewerage network managed by JEZS, as well as the use of human resources managed by JEZS. The introduction of the registration and codification system was also associated with changes in the document circulation system was also associated with changes in the document circulation system. With significant organisational changes, shifts were made to the scope of duties for all work places in JEZS. Implementation of the system was carried out in 2013. The collected information is divided into three main categories: types of work (events) – which determine the nature of the activities performed, the type of main work – which defines the task or main tasks and the performed work. The collected amount of data allowed for the analysis of the impact of the implementation of the codification and registration system of maintenance works for the sewerage network of city X on: changes in the management model of the JEZS, the type of operational events, expenditures on the operation of the system. The introduced changes improved task in the short and long-term and enabled the implementation of a new management model of the JEZS, which led to which, among others, increase of planned control and maintenance activities, reduction of random events (failures), reduction of day to day operation expenditures (monitored as working time of the physical labour and heavy equipment), creation of an extensive database of information about the sewage system. The number of failures per kilometre was reduced by 31.55%. The implementation of monitoring and registration of activities in JESZ has resulted in a systematic increase in expenditure on control and maintenance activities,

expressed as labour working time - tPB [h] and labour working time per network length tPBL [h / km]. The progressive increase in expenditure on control and maintenance activities, consequently, led to a reduction in the expenditure needed for the elimination of breakdowns by 22.26%. The decrease in expenditure on emergency measures, not included in the plans of JEZS, has a positive impact on the JEZS management. Changes in the outlays for the operation of the sewage system, expressed as the working time of the light $t_{PSL}$ and heavy equipment $t_{PSC}$, as well as the operation time of the equipment per event $t_{PSZL}$, $t_{PSZC}$, were also analysed. The decrease of the $t_{PSZL}$ by 32.5% and $t_{PSZC}$ by 29.73% was noted.

The implemented system has been developed in a way that allows for its further expansion and implementation in other plants and units with a similar profile of operation. During the research and implementation of the system, it was assumed that its expansion with new code categories and detailed codes would be evolutionary along with the changing needs of management units.