

## **The methodology of the cost minimization system of the technical process of a hard coal mine liquidation.**

The liquidation of the mine is the last and natural stage of mining activity. A decision to liquidate a mining plant may be issued as a result of the depletion of resources of exploited deposit, the unprofitability of mining in a particularly unfavorable mining and geological conditions and the expiry of a concession or excessive environmental degradation. The activities related to the revitalization and restructuring of hard coal mines are carried out by Spółka Restrukturyzacji Kopalń S.A. as the legal successor of previous mining operations. The investment process that leads to the mine liquidation is complex and costly. According to the decisions of European Union institutions, the Polish government obtained a permission to finance these processes from the state budget by the end of 2023. The budget subsidy for this purpose will amount to approximately five billion PLN. The implementation of the mine liquidation process has not been the subject of scientific research so far aimed at rationalization and minimization of the costs incurred and the available literature deals only with selected general issues related to this problem. The main aim in the study was achieved which was the development of the methodology of planning and management of technical processes of a hard coal mine liquidation allowing for the optimization and rationalization of the costs incurred while conducting activities. Moreover, the process of the cost accounting in planning the implementation of liquidation processes was used and the methodology and a tool to minimize the costs of liquidation processes of unprofitable hard coal mines were proposed. The study consists of an introduction, a review of literature thematically related to the scope of research, a description of research methods, tools and research results. At the end, conclusions resulting from the study, list of tables (15 items), list of figures (38 items) and a list of literature with 97 references and a website were included. In the study a review of literature was made and on this basis the basic concepts were adapted to the activities of Spółka Restrukturyzacji Kopalń S.A. The surveys research conducted with people directly managing the processes of liquidation allowed for a synthetic proprietary presentation of the process management state in SRK S.A. and formalizing the direction of these processes which take place during the mine liquidation in the form of maps. In the further part of the study, a statistical analysis of previously completed and currently performed liquidation processes was carried out. Activities leading to the liquidation of the mining plants are the procedural nature, however, the mine liquidation is always a single case which has a result in diversifying the size of investment outlays. The support for the implementation of the process approach in the issue of mine liquidation in terms of rationalization and minimization of the costs incurred in SRK S.A. was to develop a method of managing the costs of liquidation processes with the software for evaluation of its size. The methodology presented in the study is based on a statistical analysis of the total cost of the mining plant liquidation processes and the division of the costs into the individual component processes of liquidation. The proposed method signals to the designer that the estimated cost of the process of liquidation of another mining plant deviates from the average values previously worked out by SRK S.A. The range of acceptable values results from the assumed coefficient of data variation.