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**METODYKA OCENY STOPNIA WYKORZYSTANIA MASZYN
W PROCESIE PRODUKCJI GÓRNICZEJ**

PRACA DOKTORSKA

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**Abstract of doctoral dissertation entitled
Methodology of assessing the level of the use of machines in the mining
production process**

The main cognitive goal of the doctoral dissertation is to develop a methodology to assess the level of machine usage in the mining production process. The key element of the methodology is the creation of an analytical model, that takes into account three aspects of mining machine usage: availability, performance and usability arrived at through empirical research. The methodology of assessing the level of machine usage has been defined as a series of ordered operations – through the use of calculated coefficients of a machine's availability, performance and usability, the aforementioned series of ordered operations allows for the establishment of an indicator of a given mining machine's level of usage. In the construction of the analytical model, derived through algebraic manipulations, the weights of the aforementioned three fields have been taken into account.

Methodology of assessing the level of machine usage describes:

- definitions in the fields of availability, performance and usability of a machine,
- data necessary to determine availability, performance and usability coefficients of a machine,
- ways and tools of obtaining, collecting and processing data,
- analytical procedures for determining the level of machine usage,
- tasks for producers and users of mining machines,
- the procedure of applying the analytical model to provide support in making decisions regarding the selection of mining machines,
- the way of using the analytical model for improvement in the fields of the use of mining machines.

The goals, set in the dissertation, were achieved using scientific methods which include literature review, interviews, AHP method, analysis and logical construction method, analysis of mines' documentation, analysis of mines' monitoring systems, survey method, case study as well as statistical methods. The proper application of research methods allowed for the efficient realization of individual stages of research. The scope of the dissertation includes the following stages of research:

- literature review,
- analysis of hard coal production process,
- defining the fields of the use of mining machines,
- determination of data and ways of data obtaining, collecting and processing in the field of availability, performance and usability,

- developing the analytical model of assessing the level of the machine usage,
- developing the analytical procedures for determining the level of the machine usage,
- assessing the level of usage for selected mining machine – verification of the developed methodology,
- developing the procedure of applying the analytical model for providing support in making decisions regarding the selection of mining machines,
- developing the way of using the analytical model for improvement in the fields of the use of mining machines.

The methodology used machines monitoring systems, used in mines, which provide continuous registration of data about the operation of mining machines. The developed methodology of assessing the level of mining machine usage takes into account the specificity of the mining production and is universal; it can be applied in all hard-coal mines.