

Section 01. Innovations in Engineering

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Modern program of surveying works automation

In modern conditions of science development, mining industry is closely connected with automation of informational provision of mine workings at all stages of extracting mineral resources. Active use of computer technologies in mine surveyor's workings started in 90-es. However it often boiled down to using imported programs. Experience of work with these programs shows that they are too expensive, not translated, too difficult, do not consider particularities of domestic equipment and require high level of workers qualification.

Starting from 1996, "Laboratory of Complex Technologies" (Pavlograd, Ukraine) have developed new technology of automation of mine surveyor's department. And now, after large amount of hard and strained work, there is coming new modern technology – SAMARA (System of Automation Mine Surveyor Workings). This technology allows building and using three-dimensional models for solving different problems. The model contains graphical files and external database that has additional information about geometry of mine workings, mineral deposit and etc.

SAMARA is based on AutoCad, that's why SAMARA is easy to use and understand. The main task of this technology is building three-dimensional models of definite square in different scales.

The most convenient method of point measuring for building our model is laser scanning and tacheometry. As a result of laser scanning we get a lot of points that cover an object. However small and medium enterprises cannot afford using this equipment.

In SAMARA program, volume of mineral resources is measured by method of three-dimensional figures. The main idea of this method is that on the surface of spoil bank, definite measured area is multiplied by average height of this area. First of all, we have to find appropriate distance between the points. If the distance is too small the program will fail because of a lot of information, and will not save any results. If the distance is too big we'll get a great error in measuring of volume of mineral resources. After all these processes in SAMARA we may build our model. So, in conclusion, SAMARA program has the following advantages: it is unique and easy-to-use, has intuitive interface and high accuracy of measurement.