J. Int. Environmental Application & Science, Vol. 11(4): 361-365 (2016)

The determination of Drilling Machine Productivity in Trepca Mine Stantërg

Jahir Gashi[1,*], Vasil Jorgji[2], Izet Zeqiri[3], Sami Duraku[4], Ramiz Krasniqi[4]

[1]Independent Commission for Mines and Minerals, Prishtina, KOSOVO; [2]University of Tirana, Faculty of Geology and Mines, Mining Department, Tirana, ALBANIA;[3]University of Mitrovica, Faculty of Geosciences, Mining Department, Mitrovica, KOSOVO; [4]Independent Commission for Mines and Minerals, Prishtina, KOSOVO

Received September 14, 2016; Accepted November 07, 2016

Abstract: Trepça mine in Stantërg has used the highest productivity and mining technique since 90s. Today this technique is practiced almost in all working place. The purpose of this study is to determine the productivity of the drilling machine with high productivity. The machinery has worked in the working place so called P-140, in the X- horizon of "Trepca" mine in Stantërg and the main goal is to set the parameters of the work and its maximum activity - the rate of work according to their own specifications as: Work force, Structure of the rock mass and; other difficulties arising from the workplace. The goal is to do a study to increase efficiency and eliminate gaps by workers and the leading body of the mine while working with the drilling machine in order to increase the effect on drilling-mining (realize the largest production and to enable and achieve higher productivity).
Keywords: *High Productivity, Trepça Mine, parameters drilling, Trepca Mine*

Introduction

Stantërg ore is polymetallic and very profitable with many varieties of minerals with good percentage of metal in ore. There are four main minerals, which are: Galen, sphalerite, pyrite and Pyrrhotite. These comprise for about 75% of the total amount of the constituent minerals. Ore is found in the presence of rare metals such as Indium, gallium, and Germanium tellurite. As it is important to note the strength of the rock and ore bodies in the following will be presented in the form of table 1 and physical - mechanic properties of rocks and minerals:

Table1. The physical and mechanical properties of rocks

Minerals and Rocks	a	b	c	d	e	f	g	h	i
Limestones	2.86	2.80	494.7	50.3	5.27	87.73	51˚14	402.393	0.17
Schist	2.85	2.76	441.3	65.7	4.46	85.54	44˚39	481.141	0.17
Scarn	3.46	3.24	1,400	118.2	14.00	227.26	54˚27	678.679	0.20
Oligonite	3.67	3.48	821.2	73.5	7.43	136.11	54˚09	480.397	0.19
Sulphide	4.26	4.00	780.0	58.8	7.77	122.81	56˚26	636.622	0.19

Form which are: a-Specific mass, b- Volumetric mass, c- Compression strength, d- Tensile, e- strength, f- cohesion, g- internal friction angle, h-The module of the elasticity, i-The Poisson Coefficient

Drilling machines with high productivity has the punch hammer 1238 and its characteristic of drilling and construction in function of hammer puncher who can reach various results and are obtained other time intervals for other drillings. It is therefore imperative that any drilling machine should obtain other results by the method of recording in which the additional results will be obtained. Drilling machines for our case when the car has worked in hammer drilling puncher nr. 1238 has a 210 HL platform.
The characteristics of this machine are:

- It has the possibility of manipulation up-down and a new version of llafetes manipulation of drilling.
- Possess an electronic indicator of drilling system - observation.
- Drilling equipment Drilling lafeten diverse.
- Drilling in rotation with water.
- Possesses water under pressure and spraying water.

Corresponding: E-Mail: jahir-gashi@hotmail.com ;Tel: +(377)44/661-885; Fax: +(381)028530446

- Automatic lubrication.
- Catalyst.
- Automatic shutdown system ANSUL.
- The electrical system in 1000 v, with start-up directly.
- It is designed for movement in mines, - with diagonal roads – cross section.
- There is a direct system of drilling control system of anti-blocking, works RPCF (pressure controlled rotation feed).
- Rotation, printing and mechanism should be kept suppressed under pressure).
- Driven by four wheels, operated by steering wheel, brake position and the whole chassis lubricated with lubricant plant.
- In the centre it is equipped with a telescopic lever FOPS, owns a protective roof, lighting mechanism, the winch cable wrapped, shot water pump etc.
- The centre is equipped with a telescopic lever FOPS, owns a protective roof, lighting mechanism, the winch cable wrapped, water pump etc.
- Drilling done by Bürgi length 3 m head Drilling F = 45 mm, but there is a possibility that in other cases Bürgi to be used with other dimensions.

It has good manipulation skills and it is best presented in Figure 1, where we are dealing with manipulation and drilling system perfect way for massive mining.

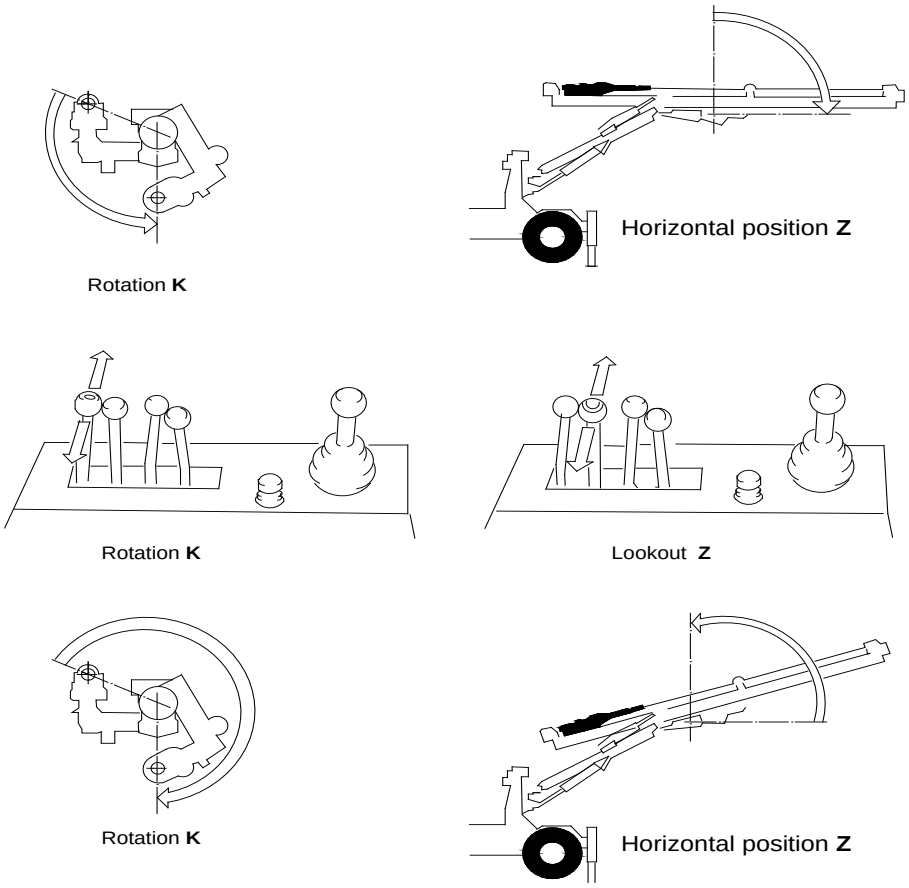

Figure1. Scheme in mechanism for more effective drilling

The determination of parameters for mining drilling in ore body

During the recording phase of drilling works in mining have reached a range of values, the results of which were recorded for each hole drilled separately and we met up in the results as follows: Forehead of drilling has been with great width and necessary for drilling two rows, so as not to wide line to endangering the workshop. It is based on the time taken for operator which will examine all the other chapters following. All these are displayed in the Gantt schedule for drilling-mining jobs with high productivity machine puncher.

Entry into the mine and the site (The entry In mine and work the forehead)
The time required for access to the site:

- Time of entry to the site is analysed in the time of 1 hour and 10 minutes.
- The time required to check the oil level and visual preview of the vehicle 20 minutes with 20 minutes are calculated time what the machine take from the garage to the working place.
- Time control and security of the site is defined the time of 20 minutes.

The drilling in productive machine
The drilling cycle is made in two positions so as it is mentioned above. The reason why we are doing two positions is for security reasons. This is best shown in Figure 2. By figure 2 are presented two positions, we would make presentation of each position separately.

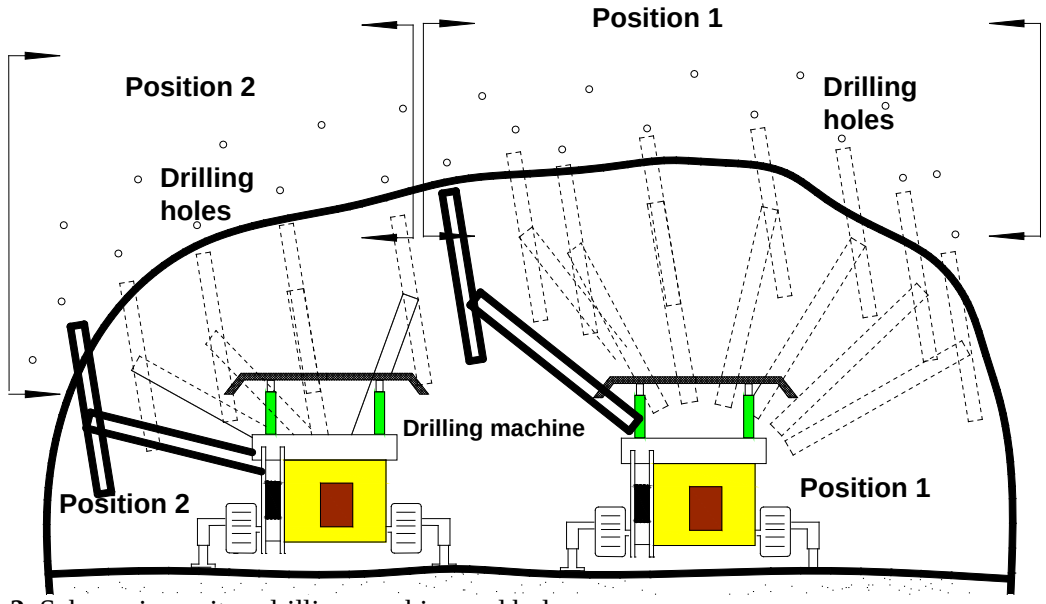

Figure 2. Scheme in positon drilling machine and holes

Position 1
All the effective time of a drilling in position 1, is explanatory in Table 2

Table2. The description of drilling in position 1

Drilling	Time of Drilling (Minute)	Description of drilling in rocks	Manipulation with continuous of drilling. (minutes)	Length of Drilling .(m)
1	3 :38	Pyrite + quartz + limestones	0 :30	3
2	3 :30	Pyrite + quartz+ galena	0: 50	3
3	3 :50	quartz + gap+ Pyrite and quartz	1 :00	3
4	5 :15	Quartz and pyrite, sphalerite	0 :30	3
5	3 :39	Pyrite+ space (gap) + quartz	0 :25	3
6	2 :54	Pyrite more empty space	1 : 40	3
7	4 :10	Pyrite + Pyrite with quartz	3 :00	3
8	4 :00	Pyrite + quartz+ galena	1 :05	3
9	4 :20	Pyrite with micro space and quartz	1 :30	3
10	4 :00	Pyrite with quartz + micro space(gap)	0: 43	3
11	4 :05	Pyrite with quartz	1 :40	3
12	4 :40	Quartz with pyrite and galena	1 :20	3
13	3 :00	Pyrite with more space and quartz	1 :00	3
14	3 :00	Pyrite +galena and more space	1:25	3

For the operator is needed about 20 minutes to change the drilling machine position from first to second stage. Look at Table 4 for Position. All the effective time of a drilling position 2 is explained in Table 3.

Table3. The description of drilling in position 2

Drilling	Time of Drilling (Minute)	Description of drilling in rocks	Manipulation with continuous of drilling. (minutes)	Length of Drilling (m)
1	1:53	Pyrite 2 (m) then space (gap)	0:30	2
2	2:15	Pyrite with micro space + quartz and galena	0:22	2
3	3:15	Pyrite	0:20	3
4	2:54	Pyrite with more space	0:30	3
5	2:40	Pyrite +limestones + micro space	0:35	3
6	3:27	Pyrite +limestones + space	0:35	2,5
7	4:03	Quartz +Pyrite galena	0:40	3
8	3:00	Pyrite and micro space	1:00	3
9	3:39	Pyrite	1:05	3
10	4:00	Pyrite with quartz	0:35	3
11	3:40	Pyrite	0:45	3

Once we get the values from the factual situation from drilling machine Drilling we have presented these graphically to win a graph function which was overwhelmed with points that are related chart and earned value. In the graph we render as follows: In the axis Y we presented drilling in the meters length. Figure. 3 chart of the drilling position 1. Figure 4 chart of the drilling position 2. In axis X in minute is presented a time of the drilling. The order of drilling with intervals and operator have given different values, but close to drawn straight line we have drawn and that has met the most points or approximated most values and straight line drawn is the graph of the function (Y = 3 / 5 X +1/4). This graph is obtained by analysis of drilling position of the drilling 1, after that is created coordinate axis with the same graphic of the function as random drilling 1, Have gave the results with which we can consider that it is more realistic (figure 4 drilling position Chart 2). Since other parameters are calculated, and then in a cycle of changing the whole activity of the graphics we presented in Table 4

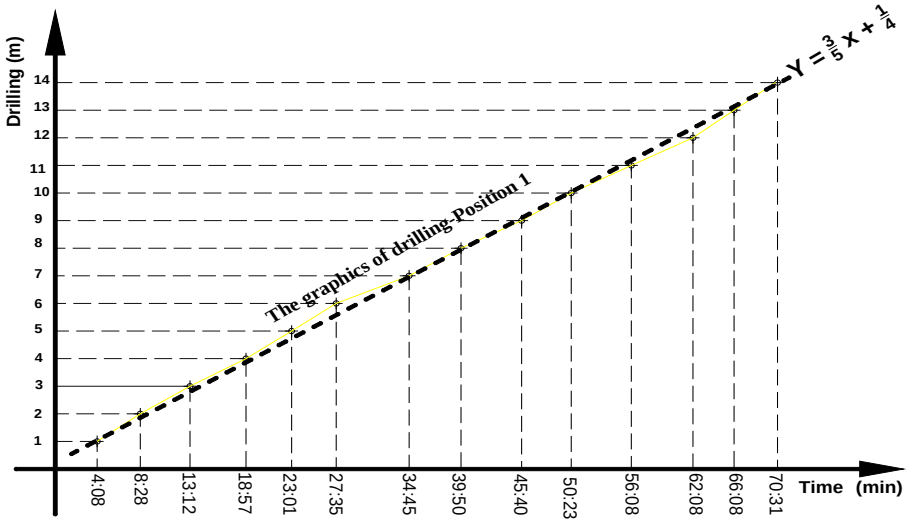

Figure 3. The graphics of drilling-Position 1

Table4. The presentation of work in timing graphic

DRILLING OF PRODUCT. MACHINE	TIME (h)				
	1	2	3	4	5
	1: 10 (minute)				
OPEN IN MINE		0: 40			
CONTR.OF MASCHINE			0: 20		
POSITION MACHINE				1: 10	
DRILLING. POSITITION 1					0: 20
REMOVE POS. 2 AND POS.1					0 40
DRILLING POSITION 2					

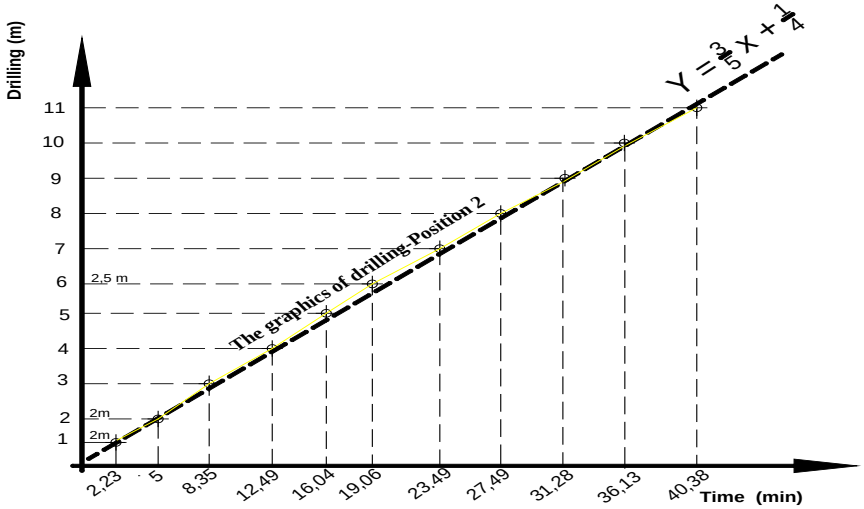

Figure 4. The graphics of drilling-Position 2

Conclusion

The machinery which has done the drilling came with resulted of a graph of the function which in Y axis shows the interval while drilling, whereby in axis X the borehole in meters. From this we can conclude that if we want to have drilling then we substitute the desired number of drilling and replace the (Y) and (X) draw in the time interval for how long shall we do for that number of desired drilling. Optimal solution should be done to decrease the operating time of positioning and better planning of the machine with high drilling productivity. The lack of good positioning could bring to the situation without operational ability, because it loses more time of at least 1 hour drilling explosive filling respectively. You have a better analysis and planning of the exploitation phase of the operator to save time

NOTES: Provisional regulation of ventilation in the XII horizon. The development of mining work can start on this horizon.

References

Designin of new underground mining facilities with dual function in the Pb-Zn mine of mazhiq Dr. Izet Zeqiri, Jahir Gashi, Rafet Zeqiri, University of Pristina, Kosovo

Gertsch R, Bullock R, (1998) Techniques in Underground Mining Society for Mining, Metallurgy, and Exploration Littleton, Co, USA

Spathis A., Gupta R. (2012) Tunnelling in Rock by Drilling and Blasting. Workshop hosted by frag blast The symposium on rock fragmentation by blasting, New Delhi, India,

Torbica S, Petrovic N, (1997) Metode i Tehnologija Podzemne Eksploatacije Neslojevitih Lezista Beograd