CONTROL AND REGULATION OF THE NATURAL-SPATIAL LOCATION OF THE VARIABILITY OF THE CONTENT OF QUALITATIVE AND TECHNOLOGICAL INDICATORS OF MINERALS IN THE ARRAY AND LOOSE IRON ORE MASS

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Summary

Object of research. The estimation of mean value of the naturally-spatial placing of changeability of content of quality indexes in the bowels of the earth is based on research of changeability of description of signs, analysis of ore-mining geometrical parameters of blocks, areas of ore body and bed of deposit of ferrous quartzites and network of reconnaissance mining holes. For the regular networks of assay of the naturally-spatial placing of changeability of content of quality indexes of minerals in the array of balance-industrial supplies the calculations of coefficients are conducted in good time for the most tyFigal configurations of mutual location of block and tests that participate in an estimation.

Methodology of researches. This estimation of annual and perspective plans of development of mountain works taking into account the dynamics of changeability of qualitatively-technological descriptions of signs of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass at moving of mountain works both on reaching and on the depth of quarry.

Purpose and research problems. The brought main stages over of research of determination of volume of block of balance-industrial supplies of different after configuration of taking blocks from the angle of slope of planning position of cuts and distance between them.

Devices are considered for the operative assay of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass at implementation of mountain works in the mode of average of content of qualitatively-technological indexes of minerals in iron-ore mass on ore mining and processing combines of Krivbass.

Keywords: ferrous quartzites, content of qualitatively technological indexes, mountain works.

Introduction

At development of annual and perspective plans of development of mountain works the dynamics of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of min-

erals is taken into account in an array and loosening iron-ore mass at moving of mountain works on reaching and on the depth of quarry.

Within the framework of general conception of management of the prepared products qualitatively technological indexes from positions of approach of the systems construction of the system of surveyor-geological management naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass is based on principles [1-4]:

- to the management unbreak naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass and by volume of producing of the prepared products;

- to the management complexity on functions, tasks and informative providing;

- to unity of management process on all cycle of forming of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass from planning to the consumption;

- standardizations of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass as to the means of management.

Establishment of conformities to law of changeability of content of qualitatively-technological indexes of minerals in iron-ore mass and determination of limits of oscillation on the different areas of ore body and bed of iron-ore deposit on a career will allow clearly and reasonably to plan direction of development of mountain works, stabilize content of qualitatively-technological indexes of minerals in iron-ore mass and improve the technical-economical indexes of work of ore mining and processing combine [5-7].

Coming from the requirements of mountain production and functions of surveyor-geological departments on the content management of qualitatively-technological indexes of minerals in iron-ore mass embrace practically all complex of tasks, have connection with planning and planning of mountain works, directly with the booty of balance-industrial supplies in the process of development of areas of ore body and bed of iron-ore deposit up to shipping of commodity iron-ore mass on an ore mining and processing factory [8-10].

1. Determination of influence of different configurations of figures of blocks of balance-industrial supplies on exactness of count of volumes taking into account the angle of slope of cuts and distance between them

Successful increase of rates of booty of balance-industrial supplies from the areas of ore body and bed of iron-ore deposit by open, underground or combined methods, the use of the newest measuring devices, high-performance equipment and computer providing on the ore-mining enterprises of Ukraine begins to dictate certain requirements and to change out-of-date methodologies. Availability and development to the proper level of the computer providing it is allowed to use them in a sufficient amount by every worker in a surveyor department. It gave possibility to automatize workaday tasks that is executed by the workers of surveyor department at cameral treatment of the field measuring. Among main problems that must be decided there is a question of count and account of volumes of mountain works balance-industrial supplies subject to condition the use of the geographic information systems, namely, what methods of count to use for providing of necessary exactness, comfort of the use and reduction to time on implementation of works.

In the method of parallel vertical cuts, that was chosen as base for modernization as most suitable for this aim and besides sufficiently widespread there are a few problem questions on a production. Among that it is necessary to pay attention to impossibility to count up volumes at the difficult after configuration excavation blocks of balance-industrial supplies. It is impossible optimally to dispose a line athwart to that build cuts, not in contempt of here condition of parallelism, as an optimal liking of fragments of line is for separate parts of block balance-industrial supplies does not lie on one line. From other side of the use of one line, subject to condition presently actual distances between cuts results in the increase of errors at a count.

Known is a situation, when on occasion projects position of line for cuts clearly set. After such location of cuts it comfortably to count a few figures with possibility them permanent accumulation or implementation of different variants of count of balance-industrial supplies, for example for the different intervals of time. However due to it a possible origin of variants is with the considerable loss of exactness.

Mainly an error arises up in the cases when the blocks of balance-industrial supplies or their part are located not athwart to the cuts, but along or under a corner near to it. As here between cuts ponder able changeabilities of configuration of contours of block of balance-industrial, a supply that is counted up are possible, and the general volume of part of block of balance-industrial supplies between nearby cuts is calculated with an impermissible error.

One of decisions in this situation there is addition of intermediate cuts diminishing distance the same between cuts and due to it error of count balance-industrial supplies diminishes [13].

Being base on these cases will pull out supposition about the use of one arbitrary direction of location of cuts in the method of parallel vertical cuts at reduction to the necessary level of distance between nearby cuts. If to define optimal distance between cuts, at the use of that oscillation of volumes of balance-industrial supplies will be insignificant at any direction of location of cuts.

The stage of being of optimal location of direction of cuts can be dropped for be what count within the limits of booty of balance-industrial supplies from the area of ore body and bed of iron-ore deposit for be what ore-mining enterprises. Simplification of process of count and account of volumes of mountain works will take place thus.

To the lacks of it is possible to take plenty of cuts got as a result. At the hand working does this method impossible at the use in practice. However with the use of his in the geographic information systems on modern computer technologies this defect disappears.

For research of behavior of size of volume of block of balance-industrial supplies from two factors of angle of slope of planning position of cuts and size of distance between them an experimental block was modeled [23]. Through the centre of gravity of block in plane X; Y and in parallel there was the conducted line the landmark of Y athwart to that cuts were separately built through 20 meters. The calculation of volume of block of balance-industrial supplies, that consisted of forming of report, was conducted, with calculations (table 1) and the built cuts in a corresponding scale (Fige 1), for possibility of hand verification of the got results [24]. A next step is calculate the same block of balance-industrial supplies with distances between cuts 20 м. Line athwart to that begin to build cuts is situated in parallel to the landmark of X.

Table 1

Calculation of volumes by the method of parallel vertical cuts with
distance between them a 20 m

Number of the first cut	Area of the first cut, м².	Number of the second cut	Area of the second cut, м²	Distance between cuts, м	Volume, м³
1	0,00	2	201,77	16,87	1134,39
2	201,77	3	247,67	20,00	4486,61
3	247,67	4	223,37	20,00	4708,27
4	223,37	5	237,70	20,00	4609,96
5	237,70	6	256,99	20,00	4945,66
6	256,99	7	279,48	20,00	5363,07
7	279,48	8	256,65	20,00	5359,62
8	256,65	9	266,57	20,00	5231,91
9	266,57	10	236,68	20,00	5029,62
10	236,68	11	40,71	20,00	2503,68
11	40,71	12	0,00	6,82	92,51
General volume:					43465,31

Fig. 1. Calculation of volume of block of balance-industrial supplies by the method of parallel vertical cuts at distance between them 20 м

Got from a report after described before by a template results will be compared to previous. The volume of block is calculated where the corner of planning position of cuts equals middle from two previous.

Analyzing the results of previous calculations the turn of line of cuts proceeds in a plan thus, that a line in relation to the centre of gravity returned after motion of hour-hand on one degree. Calculations recurred while a line was not returned on 180°. All possible variants of count of volumes of block of balance-industrial supplies were taken into account the same. At first the sizes of volumes of block of balance-industrial supplies were calculated at distance between cuts 20 м. Farther for verification of the higher described supposition diminished to distance between cuts to 10; 5; 2 and a 1 m [24].

Further reduction of distances did not give a substantial difference at these sizes of volumes of block of balance-industrial supplies. Re-

search of dependence is completed by the calculation of volume of block of balance-industrial supplies at distances between cuts 1 m.

For every count of volume of block a report that contains a table with data of numbers of cuts of areas and volume of block of balance supplies of areas between two cuts was formed.

From these data the graphic arts of dependences, that specifies on that the angle of slope of cuts loses a substantial role at reduction of distances between cuts to the optimal value, are built.

For example for the chosen block of balance-industrial supplies it is expedient to use distance between cuts, that 1 м. equals Making sure is herein possible even by sight considering the compatible chart of dependence of size of volume of block of balance-industrial supplies, that is counted up from the corner of line of reaching of cuts at the different values of distance between cuts. Line that equals a 20 m has most error of size of volume of block of balance-industrial supplies and impermissible for the use of arbitrary corner. Impermissible and next lines that answer distances 10; 5 and 2 m.

Comparing them there is a tendency to straightening of line on the mark of faithful volume of balance-industrial supplies. Lines do not almost differ one from other, and have an identical value of volume of block of balance-industrial supplies at all variants of angle of slope that confirms our supposition. A line has the least deviation from the real volume of block of balance-industrial supplies and that is why distance between cuts in a 1 m used for the arbitrary planning corner of location of cuts.

For determination of influence of different configurations of figures of blocks of balance-industrial supplies on exactness of count of volumes on the career of ПрАТ «Inhuletskyi ГЗК», three varieties of taking blocks were chosen on different horizons: the event is prolate, with the rounded configuration and the combined variant (Fig. 2) [24]. The volume of different configurations of blocks of balance-industrial supplies was determined at the different values of distance between cuts and anything of corner of line of reaching of cuts [3]. The results of direct configuration of block with authority did not differ from the results of the volume of block of balance-industrial supplies created for research of size from influence of planning location of cuts and distances between them. For the taking block of balance-industrial supplies of round configuration, after before they got results are

erected the described methodology in a table. By the aim of comparison of data and statistical analysis for determination and estimation of exactness undertaken studies. Analogical actions are created for the block of balance-industrial supplies with protuberant configuration.
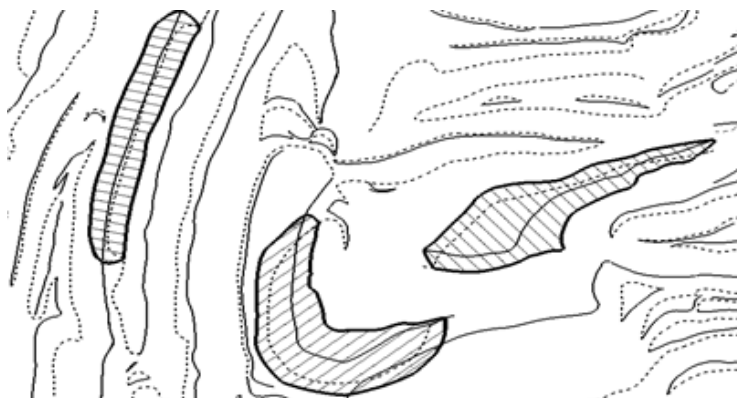

Fig. 2. Configurations of taking blocks of balance-industrial supplies are with crossing for the count of volumes

Comparison of results of the taking blocks of balance-industrial supplies got after different configurations took place after ore-mining geometrical graphic arts. From the analysis of charts come to the conclusion about the use of arbitrary direction of location of cuts in a plan.

Possibility of the use of methodology of count of volumes of balance-industrial supplies is confirmed for different configurations of blocks. Researches wer executed and for the terms of other quarries of Ukraine, that confirmed previous results.

Thus, at reduction to distance between cuts to the optimal value it is possible to use arbitrary direction of planning location of cuts. For comfort of the use and choice of only direction, and for the removal of misunderstanding at the choice of different directions it is recommended to use a northward.

2. Control and adjusting of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals are in an array and loosening iron-ore mass

Increase of qualitatively-technological indexes of the prepared products - one of basic problems of modern science, technique and

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all national economy. The increase of level of qualitatively-technological indexes of the prepared products assists the increase of volume of realization of the prepared products and increase of profitability of production. The quality indexes of the prepared products are mortgaged at planning and provided in a production and supported in exploitation. Within the framework of general conception of management of the prepared products quality indexes from positions of approach of the systems construction of the system of the surveyor providing of works for a management naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass is based on next principles [3]:

- to the management unbreak naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array, loosening iron-ore mass and by volume of producing of the prepared products;

- standardizations of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass as to the means of the management;

- to unity of management process on all cycle of forming of content of qualitatively-technological indexes of minerals in iron-ore mass from planning to the consumption;

- to the complexity of the surveyor providing of works for a management on functions, tasks and informative providing.

Control of technological processes of booty and magnetic separation of minerals in iron-ore mass is one of important measures, by means of that support of rhythm of processes is arrived at the maximally possible productivity and set qualitatively-technological indexes of magnetic separation. In order that the checking system was effective, information about content of qualitatively-technological indexes of minerals in iron-ore mass must be clear, objective, operative and exhaustive.

Concentration of production and continuous increase of volumes of booty of balance-industrial supplies and exception of content of qualitatively-technological indexes useful to the component, related to magnetite in iron-ore mass on an ore mining and processing combine, stipulates, necessity of development of new and perfection of existent

methods and technical equipments of assay and control of content of qualitatively-technological indexes of minerals for iron-ore mass.

On Inguletc, Central, North and other ore mining and processing combines the physical methods of assay and control of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals are inculcated in an array and loosening iron-ore mass at operating secret service and geological providing of booty of balance-industrial supplies (Fig. 3) [3].
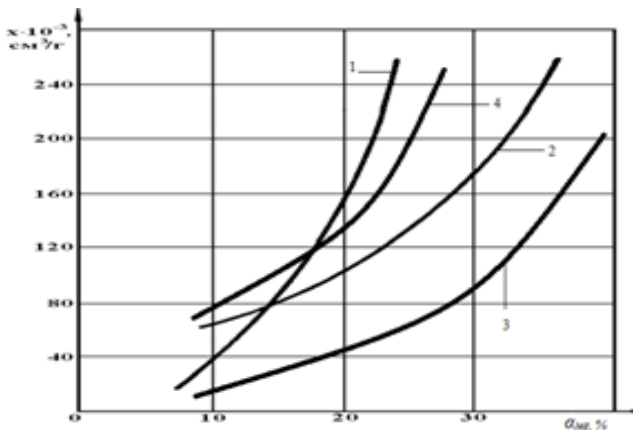

Fig. 3. Dependence of magnetic perception of the naturally-spatial placing of changeability of content of quality indexes of minerals in loosening iron-ore mass from content of quality indexes useful to the component, related to magnetite, on the deposits of Krivbass: *1* - Inhuletskyi; *2* - Skelewativske; *3* - Large Gleuwatka; *4* – Gannivske

Works, from introduction of geophysical methods of assay of content of qualitatively-technological indexes of minerals in iron-ore mass, on ПрАТ «Inhuletskyi ГЗК» conducted on a career on extractive coalfaces. By means of apparatus of *РСР*-3 and *МФ*-2 determination of content of qualitatively-technological indexes is executed useful to the component, related to magnetite in iron-ore mass (general and magnetite). Measuring in a coalface comes true for the networks of supervisions a 1^x1 m at the double measuring in points. Error of assay of content of qualitatively-technological indexes useful to the component, related to magnetite not exceeds 1 %. In the chemical laboratory of ore mining and processing combine for determina-

tion of content of losses of content of qualitatively-technological indexes useful to the component, related to magnetite the device of construction of institute of *НДІАЧермет* is used in the tails of magnetic separation, and for determination of content of qualitatively-technological indexes useful to the component, related to magnetite in loosening iron-ore mass - *АЖР*-1 [3].

On Hleiuvatskyi career of ПрАТ «Central ГЗК» with the use of apparatus of *КМВ*-3 logging of буровибухових mining holes is executed. Error of determination of content of qualitatively-technological indexes useful to the component, related to magnetite in boring sludge's that is got a magnetometer method, in comparing to the error of chemical analysis folds ±1 % [3].

The assay of loosening mountain mass comes true with the use of apparatus of *РИМВ*-1 (for the unoxidized minerals) and to the complex of devices of *РСР*-3 and *МФ*-2 (for simultaneous determination general and useful of magnetite to the component). For express-analyze of the powder-like masses, in laboratory terms, worked out and magnetometer scales are successfully used.

On Hannivskyi and Pershotravnevnyi careers of ПрАТ «Pivnichnyi ГЗК» logging of blast holes, comes true with the use of device of *КМВ*-3, point determinations of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array are executed through a 50 cm on the depth of mining hole. Testimony to the device, translated in content of qualitatively-technological indexes useful to the component, related to magnetite after the chart of cross-correlation dependence (r=0,956) [3].

Assay naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array on blast holes on Pershotravnevnyi quarry of ПрАТ «Pivnichnyi ГЗК» comes true by geophysical methods.

Divergences in determination of content of qualitatively-technological indexes useful to the component, related to magnetite, by means of logging, with the results of control chemical analyses of boring sludge's does not exceed 1-1,5 %.

For determination of content of qualitatively-technological indexes of minerals in loosening iron-ore mass, in laboratory terms, on ПрАТ «Pivnichnyi ГЗК» the apparatus of *АЖР*-1 is used (Fig. 4.) [3].
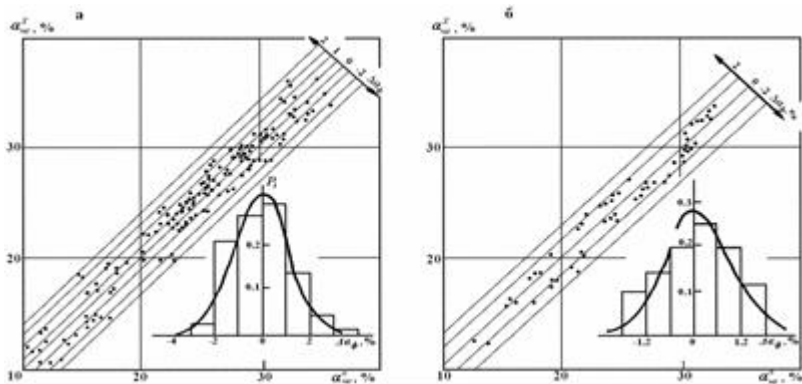
Fig. 4. Comparison of results of assay of the naturally-spatial placing of change-ability of content of quality indexes of minerals in an array and loosening iron-ore mass by magnetometer and chemical methods on careers: *a* - ПрАТ «Inhuletskyi ГЗК», *b* - ПрАТ «South ГЗК»

Thus, there are devices that allow operatively with an error that fully satisfies to the requirements of production, to determine content of qualitatively-technological indexes useful to the component, related to magnetite in iron-ore mass. Use of different technical equipments for the receipt of operative information about content of qualitatively-technological indexes useful to the component, related to magnetite in iron-ore mass, does not decide a task forming and surveyor providing of works for a management content of qualitatively-technological indexes useful to the component, related to magnetite in iron-ore mass in the process of booty of balance-industrial supplies and exception of content of qualitatively-technological indexes useful to the component, related to magnetite in iron-ore mass.

Necessary development and introduction on the ore mining and processing combines of the system of the surveyor providing of works for control and management the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals are in an array and loosening iron-ore mass.

On the base of modern methods of analysis and technical equipments, in time reliable information turns out about content of qualitatively-technological indexes of minerals in loosening iron-ore mass. On this basis to forecast, operatively to regulate and influence on quality of productive processes of booty of balance-industrial sup-

plies and exception of content of qualitatively-technological indexes useful to the component, related to magnetite in iron-ore mass.

The inalienable constituent of the system are effective methods of economic stimulation of increase of qualitatively-technological indexes of the prepared products. On ore mining and processing combines the scientifically reasonable structures of service and norms of quantity of technical and engineering employees, that carry out control and management naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass in the process of booty of balance-industrial supplies and exception of content of qualitatively-technological indexes useful to the component, related to magnetite in iron-ore mass, are absent. To Volume, these questions, in different there are degrees force to occupy technical and engineering employees of different productive subdivisions. Worked out Automated control system of the surveyor providing of works for a management a quarry, organization of management naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass comes true by such method. Planning of ore-mining technological works is on a career, taking into account descriptions of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass [3].

Adjustment of the separate stages of planning, conducted with the use of computer technologies. The analysis of productive situation is preceded the process of correction for the past stage of planning of content of qualitatively-technological indexes of minerals in loosening iron-ore mass. Results of analysis, determine a necessity and size of adjustment of the level of planning of content of qualitatively-technological indexes of minerals marked below for loosening iron-ore mass. Initial information that is needed for drafting of the productive program of i-го level of planning of content of qualitatively-technological indexes of minerals in loosening iron-ore mass comes on the computer center of combine. The results of decision are passed in a technical department, where a rightness and acceptability of the got results are checked up.

For the increase of efficiency of magnetic separation the operative surveyor providing of works comes true for a management content of

qualitatively-technological indexes of minerals in loosening iron-ore mass during a change. It is explained that in the process of work of quarry, arise up different family indignations, that is expressed in changeabilities of mining-and-geological and mining-and-technical terms, that violates plan of change on content of qualitatively-technological indexes of minerals in iron-ore mass.

For support in the set limits of the productivity and content of qualitatively-technological indexes of minerals in iron-ore mass of total stream from a quarry, operative intervention is needed in work of extractive and transport equipment during a change.

At creation of the technical system checking and surveyor providing of works for a management technological processes in a career with the use of facilities of the computing engineering next functions are executed [3]:

- operative control and communication of data come true in control system about content of qualitatively-technological indexes of minerals in loosening iron-ore mass on the coalfaces of booty of balance-industrial supplies and sections of composition of averegenation of content of qualitatively-technological indexes of minerals in iron-ore mass;

- the state of extractive power-shovels is controlled during a change (free, worker, accident);

- control comes true and follows work of power-shovels and motor transport, id est the route of motion empty to autotipper is determined;

- mass of the transported minerals in iron-ore mass, t;

- content of qualitatively-technological indexes of the transported minerals in loosening iron-ore mass %;

- productivity of each autotipper, t·kilometre;

- productivity of every power-shovel, т/hour;

- an unloading (crush factory, composition of averegenation of content of qualitatively-technological indexes of minerals in loosening iron-ore mass) place is appointed;

- content of qualitatively-technological indexes of minerals is controlled in loosening iron-ore mass (%) that comes on an ore mining and processing factory.

Except technical equipments, considered chart of Automated control system of management a quarry, that has the specialized compu-

ting device that intended for the decision of task of the operative planning and corrections volumes of booty of balance-industrial supplies on coalfaces taking into account content of qualitatively-technological indexes of minerals in loosening iron-ore mass, and also, for a management work of transport [3].

Inwardly a variable management a transport and extractive equipment is executed on the basis of results of the operative variable planning of content of qualitatively-technological indexes of minerals in iron-ore mass. After it, time of change, broken up on j of even intervals of management for t minutes each.

Coming from distribution of variable volumes of minerals in iron-ore mass on extractive coalfaces, in the calculation of volumes of qualitatively-technological indexes of minerals in loosening iron-ore mass, that must be shipped from every power-shovel at the t minutes of management, is executed the specialized computing device.

The results of decision are added to block-memory of machine during a change. They are planovimi indexes for every interval of the surveyor providing of works for a management naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass.

3. Management a transport and extractive equipment, with an aim, in iron-ore mass comes stabilizing of content of qualitatively-technological indexes of minerals true by such method

At an entrance in a quarry empty autotipper by means of transmission device reports his number in a transmitter-receiver that is located under linen of way that passes him in block-memory of the specialized computing device. To information that came from the device of the periodic questioning of power-shovels specifies where a free power-shovel and his number are is illuminated on a light board. In accordance with it to the number, driver of autotipper chooses the route of motion.

For control and account of work of mine transport complex fixing of numbers of autotipper and power-shovel to that he is sent is executed in block memory of machine. At departure from a quarry loaded autotipper passes a device that determines the weight and transmitter-receivers, where weighing of mountain mass that are transported, and fixing of number of autotipper is conducted.

They got information is passed in the specialized computing device, where on the number of autotipper to block memory of the specialized computing device the number of extractive power-shovel that executed loading and content of qualitatively-technological indexes of minerals is determined in the shipped iron-ore mass, is added.

After it, on a light board the place of unloading of machine (a crush corps or composition of averegenation of content of qualitatively-technological indexes of minerals is in loosening iron-ore mass) is specified.

For every interval of management in verification of implementation of plan tasks is conducted the specialized computing device on content of qualitatively-technological indexes of minerals in iron-ore mass and volumes of booty of balance-industrial supplies.

If quality indexes and volume of minerals in iron-ore mass in a total stream in j management interval answer plan indexes, all autotipper in (j-1) the th interval of management head for unloading in a crush corps.

In case of changeability of productive situation in a career (abrupt end of one or a few power-shovels, salutatory changeabilities of content of qualitatively-technological indexes of minerals in iron-ore mass in i-ohm coalfaces) in the redistribution of volumes of booty of balance-industrial supplies is conducted the specialized computing device on power-shovels. Thus, one or a few sections of composition of averegenation of content of qualitatively-technological indexes of minerals in iron-ore mass (depending on his volume) are accepted as additional extractive coalfaces.

For determination of actual content of qualitatively-technological indexes of minerals in iron-ore mass that comes on an ore mining and processing factory, on a conveyer ribbon the sensor of continuous determination of percent exception of content of qualitatively-technological indexes is set useful to the component, related to magnetite in commodity iron-ore mass. Given about content of qualitatively-technological indexes of minerals in loosening iron-ore mass in the process of change come on controller's point.

Thus, Automated control system over of the surveyor providing of works is brought for a management on a career, allows to do the optimal forming and management naturally-spatial placing of changeability of content of qualitatively-technological indexes of

minerals in an array and loosening iron-ore mass on all stages of planning of mountain production and his management on a career. The further forming of content of qualitatively-technological indexes of minerals in iron-ore mass takes place on an ore mining and processing factory.

In accordance with the technological indexes of magnetic separation, at every level of planning, requirements are set to content of qualitatively-technological indexes of minerals in commodity iron-ore mass on the next stage of planning of mountain works. This same, a feed-back comes true between the process of magnetic separation and mining production.

Practical possibility to do, allows operative control and assay of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass and foods of magnetic separation physical methods [3]:

- to give up the out-of-date form of control and pass to more progressive systems checking and surveyor providing of works for a management the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass;

- to simplify technology inwardly quarry averegenation due to the rational working off power-shovel blocks with the account of even and proportional distribution to the booty of high-quality technological and balanced on maintenance qualitatively-technological indexes minerals of supplies during the planned period;

- as a result of increase of operation ability of receipt of information to bring down in the process of booty the losses of balance-industrial supplies and obstructions of content of qualitatively-technological indexes of minerals in loosening iron-ore mass;

- to promote authenticity, evidentness and operation ability of information about the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass that allows to intensify introduction of automated systems of the surveyor providing of works for a management mining works on a career.

For the construction of more flexible system of the surveyor providing of works for a management naturally-spatial placing of changeability of content of qualitatively-technological indexes of

minerals in an array and loosening iron-ore mass, expediently, on enterprises to distinguish independent productive subdivision, that is responsible for planning, forming and control of content of qualitatively-technological indexes of minerals in iron-ore mass.

Conclusion

1. The model of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals built after this algorithm in the array of areas of ore body and bed of iron-ore deposit is used for the count of balance and industrial supplies, optimal planning of mining enterprise, and also corporate strategic and medium-term planning of mountain works on an operating enterprise.

2. The brought main stages over of research of determination of volume of block of balance-industrial supplies of different after configuration takeout blocks from the angle of slope of planning position of cuts and distance between them. Reduction to distance between cuts to the optimal value is used arbitrary direction of planning location of cuts. For comfort of the use and choice of only direction, and for the removal of misunderstanding at the choice of different directions it is recommended to use a northward.

3. Automated control system of management is on a career, allows to do the optimal forming and management naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass on all stages of planning of mountain production and his management in a career.

4. Perspective devices that are intended for the operative assay of the naturally-spatial placing of changeability of content of qualitatively-technological indexes of minerals in an array and loosening iron-ore mass at implementation of mountain works in the mode of averegemant of content of qualitatively-technological indexes of minerals on the ore mining and processing combines of Kryvbas are considered.

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