NEW CONCEPTUAL BASES OF THE DEVELOPMENT THE COAL INDUSTRY IN RUSSIA

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The complicated mining and geological conditions of Russia layers sharply complicate the branch‘s transfer beside the conditions of the market management system. The basic principle is the unsubsidized highly effective working regime of coalmining enterprises. In this case the world technology and technique level are oriented down the favorable mining and geological conditions, due to which it is ensured the high efficiency of work. Moreover, the scientific potential intensely continues to improve the technology and techniques in connection with these conditions. This potential complicates the mining work with negative conditions. To change, to moderate the work effectiveness of the work of coalmining enterprises beyond the mining geological and conditions possibly only due to compiling the fundamentally new level of technology and guarantee means of mining, building coalmines, improving the systems of engineering safety and an additional technological element. I.e., it is necessary to have a new turn of the scientific and technical progress in the coalmining, where mining and geological conditions haven’t had an invisible effect of production’s efficiency. Only in such conditions it is possible to regenerate the development of coal areas, to revive the depressive coal areas and the reduction in the social tension as a general in the coal industry.

The work experience of Kuzbass experimental coalmines and technological and technical developments of scientists using the radical approach to the solution the coalmining problems convince in the necessity and possibility of a cardinal change the concept in the development of coal industry as a whole. As scientists say, it is necessary to exclude basic traditional technological and technical decisions in the coalmining, to exclude due to the complicated usage conditions of the mechanized capital-intensive complexes, to ensure the coal’s enrichment due to the underground conditions before the technology process, to change fully guarantee means of cleaning and preparatory works with the complete cleaning type and preparatory technology.

The solving just one of the problems guarantee technological and technically underground enrichment enumerated above the ensures of new scientific and technical level the coal industry, since number of other sharpest problems simultaneously are solved:

1. Expensive is reduced one ton of concentrate more than by 100 rubles.
2. The problem of ecological cleanliness during the enrichment is solved radically.
3. The coefficient of the mineral extraction from the mineral resources is raised sharply.
4. The possibility of the rational, consistent the formation of layers is ensured, including delicate.

In this case the problem of underground enrichment is solved in the process of the technological and technical support of coalmining based on the new methods of destroying the coal mass, transport and unloading of raw material down the plants product, passing the surface concentrating plants. Scientists just not developed the base of new technologies, but also successfully injected and approved it in some coalmining enterprises in Kuzbass. It suffices to say that only of one experimental coalmine "highland -1" is given out more than 400 thousand tons of clean coal marked by "G" with the thickness of plastic layer - 24-30 millimeters and with the ash content from 6 to 10% . It is set down the coke-chemical plant in Kemerovo city and others. However, the owners of the coal reserves observe the increasing an every day. This tendency is prevailing, searches the ways to accelerate the building of coalmining enterprises with the low prime costs in the self-supported, unsubsidized way of the development in mining. This problem is much more complex than the first, because it's required radical changes in the canonical skill bases of the construction coalmines, the ground provision and methods of conducting the water-cut incline of break inclines bore pits and inclines. It is obviously today that the only possible and correct development of coal industry of Russia across the American system is through the system of the small own highly effective coalmines. The Kuzbass coal problem can be solved by 100 small coalmines additionally starting in the exploitation with an annual volume in 600 thousand tons each. The prime cost of the extraction of enriched coal in the process of conducting the experiment due to the complicated mining and geological conditions for the copied reserves was about 70 rub. /a ton and the productivity are more than 300 tons down the man per month. As for the rock mass then an index will be still higher. They have proved the possibility to transfer unprofitable coalmines in the unsubsidized highly effective regime of work the coalmining enterprises demonstrated it in 5 coalmines in Kuzbass. A special interest to this is a fundamentally new technology and guarantee means are showed by investors and owners of the coal reserves , which commands the possibility of the accelerated coalmining construction with an annual productivity of 600 thousand tons during the 5-6 months with the prime costs not more than 40 million rubles. But the sixth experimental coalmining enterprise "Anzherskaya" will be introduced in the record compressed period - during the three months. Moreover, scientists plan to experience their main development -manless hydro-plough technology of coalmining, which due to the complicated mining and geological conditions in negative areas will ensure the world's technical-economical indexes. The science has developed the basic concepts of a new level in the coalmining, including the coalmining buildings. It gives determining strategic direction in further development of coal regions, and in parallel it is solving nontraditionally list of problems during the coal processing, combustion, and production of coke. In this case the solutions of the uncommonly complex problems proved to be very

simple, against a base which was laid the negation principle of all technological and technical it was team coal mining, not corresponding down the necessary level of the market system of management and replacement it as nontraditional. But the present moving of the coalmining and processing down the new scientific- technical level in comparison with the previous level is more radical because it affects not only cleaning works, but the complete complex of cleaning preparatory works, an ecological problem and an enrichment, ensuring the sharp reduction of expenditures for all technological links.

The new scientific- technical level of the coalmining (pic.1) consists of:

The surface complex of a coalmine with an annual volume of the output about 600 thousand tons and the total number of workers not more than 150 people. It consists of the complete set the necessary mobile structures, including:

- Lamp room,
- Room of clean and working clothing,
- washing room,
- control room,
- Director of and chief engineer offices,
- Job order room,
- The bookkeeper office and personnel department,
- garage.

2. The incline's conducting is provided by the new supporting- stepping machine with a flooded face space and a roof bolting with an expansion - type support throughout entire length.

3. Traditional system of coalmining heating air. Boiler- calorific is replaced by the system of heating air using thermal heat which provides a dust-suppression due to the control of the prescribed humidity entering in a coalmine air flow.

4. The traditional multi-expensive system of a pumpage without the system of the mechanical cleaning of water. This system is replaced by the cascade system of pumping stations, and the system of sumps which consists of two manufactures with the mechanized cleaning, which provides the slime's hydraulic jet washing and watering fines the workings.

5. The system of the clarification mining water due to the underground conditions and the ground conditions on the providing the consistent partial fault of water throughout the sump's section.

6. The capital-intensive multi-expensive traditional technologies of cleaning and preparatory works are excluded. They include the application of the mechanized complexes due to the complicated mining and geological conditions and the transport systems in the form of belt conveyers and reloaders and chain-and-flight conveyors. All crawler-tracked equipment is

excluded from the preparatory works, as ineffective, with the extraordinarily low stability coefficient.

Instead of it there was created the fundamentally new supporting- stepping heading-and-winning machine HWMA- 3M (modernized) by Atrushkevich O.A., the can. of tech.sc. with the system of remote control. I.e., there is provided the possibility of using just one type of the newly created machine HWMA- 3M (modernized) to produce all range of underground works due to different mining and geological conditions:

- driving coal workings and refuse stone with the angles ± 30° without the conveyer transport and with the use of low-pressure water from the cascade systems,
- - the production of a coal-face operation of all layers range and about the angle of an incidence from 3° to 90° ,the power from 0,8 and up, since it possesses the increased stability and maneuverability in three planes without the linear displacement,
- - driving cross -cuts and rock drifts without the application of blasting operations, including firm sandstones due to the use of special disk cutters,
- - machine HWMA- 3M excluded practically all traditional cleaning technique in the form of the complexes, conveyer transport, sinking crawler-tracked equipment, rail-tracked and in this case it provided the interrelation with other enrichment systems in the coalmining, in the process of a technological cycle.
- 7.There was created the unique system having no any analogs of the underground coal dehydration and reusable supply of process water based on the combined resonance effect down the process of dehydration and separation water from coal at different combined forces, provided the effective process of dehydration. The technology parameters are represented in the table 1.

Table 1.

The main parameters of the conveyer-line technology

Designation of the product	Output		Zonation, %
	%	Tons per hour	
Run-of-the-mine coal	100,0	150,0	12,4
Concentrate	92,9	139,4	8,6
Refuse stone t/h	4,7	7,0	88,6
Isolated during the hydraulic conveying	3,0	4,6	88,6
left during the workings	1,7	2,5	88,6
Losses	2,4	3,6	12,4

8. There was excluded the irrational multi-expensive way of preparation to the output the level where inclines revealed completely the level, and the mining was going by a reverse formation.

The created providing technology and the technique make it possible to conduct step-by-step opening and to perform mining by a forward stroke. The mining preventive has to be provided via periodic flooding.

9. During the mining of semi-steep and steep layers are excluded labor-consuming and vertical minings. There is also excluded in-stone development due to the spiral declines and the possibility of inclined minings by the supporting- stepping machine till 30°.

10. There is a technological possibility of hydro-plough manless output with the use in the short working face the plough assembly with the reciprocating supply and the hydraulic self-flowing transport of repelled coal with the remote control besides entire the system.

11. The direct supply of clean coal down the by-product coke plants is provided by the crushing and screening unit of slit performance and by the fundamentally new gravity crusher. Up contoured conceptually fundamentally new, more radical, than preceding, scientific- technical level of coalmining prepares the Russian coal brunch to an accelerated unsubsidized reappearance. In this case it is obviously that all negative factors of present branch's restructuring make in this process the invaluable contribution both as to the passage enterprises dynamics down the new technical level and down a change in the organizational system of management, excluding in this case the negative, complicating effect beyond the production process factor of the social or imitation virtual property. So, the Kuzbass, possessing the possibility of the accelerated building the small new level coalmines with an outputting volume 600 thousand tons per year can restore previous output volume in 150 mln. Per year with the higher percentage of the participation the scarce coal brands during the five years, because the increment must be produced according to the comparison of expensive unit due to the underground coalminings. In this case there is a decreasing of the open works volumes, and using the technology of underground enrichment which solve a radically ecological problem in the process of coalmining. Thus, the new scientific- technical level of coalmining sharply decreases the effect of mining and geological conditions beyond production efficiency and thus provides the revival of negative coal areas. In this case in the complicated mining and geological conditions are concentrated the coal scarce reserves, which amplify the technical and economic possibilities of unsubsidized highly effective enterprises work.

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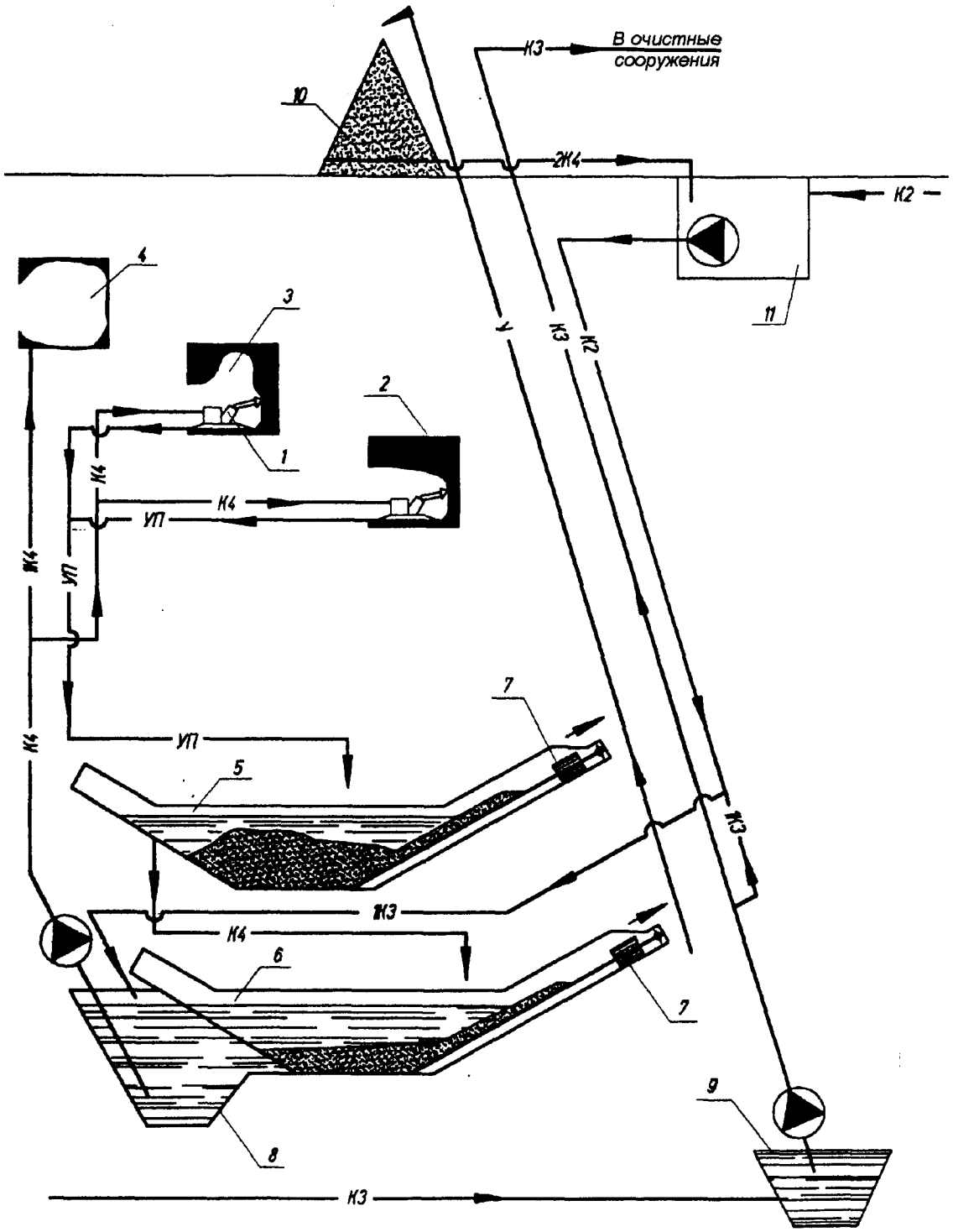

disposal facility

Conventional signs.

/ -machine
2 - development heading
3- system's highwall mining
4 - mined-out space
5 – room of the primary process water clarification
6 – room of the secondary process water clarification
7 – coal dehydrator
8 - drain sump clarifier
9 - drain sump of pumping system

K4 – process water
1K4 – overflow a technologic water-supply
2K4 – coal stock room drainage
K3 – coalmine inflow (groundwater inflow)
1K3 - technologic water-supply adding
K2 - overland flows
CS - coal slurry
C – dewatered coal

10 –coal stock room
11 - accumulator- dewatering box of overland flows from the mine site

Pic. 1. The technological scheme of the hydro- coalmining enterprise using the new scientific- technological level.

Conventional signs

Q – hour load of the hard mass, t\h
$Q_ц$ - circulating load of the hard mass t\h
Qc -total load, on the hard mass also, t\h
γ - produced coal make, %
A - zonation, %
V_n – volume load (coal and water), м^3/ч
$Vв$ – volume load at the water, м^3/ч
δ - mass concentration hard in the water, кг/м^3
W- wetness, %

Рис. 2. The scheme of the continuous method with the underground water- supply cycle, coal dewatering and clarifying process water.