

## CONCEPTUAL BASES OF THE ORGANIZATIONAL AND TECHNOLOGICAL PROVIDING ECOLOGICALLY OF SAFE MINING PRODUCTION

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**Summary.** Presently in the basic mining regions of Ukraine there was a difficult and dangerous situation, caused that the technogenous loading on a natural environment from development of deposits of minerals became so considerable, that put such regions on the verge of ecological catastrophe. In these terms the special sharpness is acquired by the problem of development of the new going near realization of deposits which must simultaneously provide minimization of ecological harm and increase of economic efficiency of production. The conceptual bases of such approach developed authors are expounded in this article.

**Keywords:** conception, development, mining industry, technology, ecologically-economical approach, ecological safety.

### INTRODUCTION

Ukraine is one of the largest mining countries of the world. On a production capacity and scale of mountain works its mining complex is included in four the largest among countries with the developed mining industry. This complex is conducting in the structure of industry of Ukraine and its economy, by submitting one of the most large sources of the financial entering the state budget.

However lately the basic mining regions of Ukraine ran into a serious problem, consisting in that over the protracted intensive development of deposits of minerals brought to considerable violations of the state of natural environment in by Donetsk, Pridneprovsk, Kirovograd, Lvov-Volynsk coal pools, Krivorozhsk iron-ore pool, Nikopol-

marganets pool. To beginning 2000 years these violations attained such scales, that the indicated regions appeared on verge of ecological catastrophe.

The followings displays have such violations:

– scale changes of the geomechanical state of bowels of the earth, which result in the mass moving and bringing down of surface, technogenous earthquakes, mountain-rock shots [1, 4, 5];

– that brings violation over of the hydrogeological state of bowels of the earth, causing the uncontrolled moving of considerable volumes of underground waters, to drainage of large areas of earthly surface, water-flooding of considerable territories, solinization and sources of drinkable water-supply [7, 9, 17];

– violation of chemical composition of air as a result of the troop landings of toxic and chemically active gases from work of equipment, explosive works and gas-outcoming of breeds, broken mountain works [2, 4, 10, 11];

– change of chemical composition of soils as a result of their contamination the pulverulent particles of useful minerals and in passing extractive mountain breeds, which have cardinally different chemical composition from composition of soil [3, 4].

All of these processes sharply put the problem of necessity of urgent decline of the

techogenous loading from activity of mining enterprises on an environment, that decisions of problem of ecological safety of mining production and his enterprises.

*1. Basic complications of decision of ecologically-economical problem*

The decision of foregoing problem restrains a temper the followings factors:

- by absence of the scientifically grounded going near development, planning and introduction of technology and techniques which provide the decline of the negative influencing of mining production on an environment;
- by the insignificant volume of technological and technical decisions which would provide ecological safety and economic effective development of deposits simultaneously;
- by absence of the scientifically grounded directions of development of mining enterprises in the conditions of intensification of production, complication of geotechnical and economic their operating conditions;
- by the low rates of conducting of researches of system-economic aspects ecologically safe functioning of mining enterprises.

Researches of row of organizations are devoted the decision of problems of ecologisation of mining complexes of Ukraine. The most meaningful fundamental results are got the group of scientists of such universities of Ukraine, as the East-Ukrainian national university the name of V. Dal, Donetsk national technical university, National mining university and Krivorozhsk technical university. During the last researches were 10 years conducted and the complex of developments of conceptually-theoretical and applied character is executed for the decision of this problem. These developments are taken in the general problem-oriented work «Development and introduction of high-effective technologies of ecologically defense orientation of production complexes of Ukraine» which includes developments on such directions:

- conceptual theoretical bases of the ecologically-economical going near providing and organization of ecologically defense mining production [1, 7, 10, 11, 12];
- analytical researches, laboratory and industrial experiments on the different aspects of planning of technological processes and mountain equipment for perfection of production processes in sending of decline of their harmful impact

environmental and providing of economic efficiency of development [6, 13, 14];

- scientific grounded methods of calculation of parameters and methods of management the processes of guard of bowels of the earth, earthly surface, water environment and atmosphere at development of deposits [13, 14, 18];
- scientific bases of development of system-economic aspects of the complex use of natural resources, increase of ecological safety of mining production, organization of production and management enterprises [19];
- technological decisions on realization of development of deposits of minerals with the use of facilities, removing the dangerous production troop landings ecologically [15, 16, 18, 20];
- to recommendation on determination of ways of further improvement of ecologically-economical activity of mining enterprises [1, 7, 14, 18].

Theoretical positions of this work served basis for development of new technologies and modernization of activity of mining enterprises which do not have analogues in world practice and oriented to the decline of the negative influencing of mining production on the state of natural environment with the simultaneous providing of high economic efficiency of mining. The substantive conceptual provisions of this work are set forth below.

*2. Features of innovation-investment activity in area of mining production, as basis of introduction of ecologically defense technologies*

One of major terms of providing ecologically of the safe and economic effective functioning of mining production is the grounded innovation-investment policy of enterprise, taking into account influence of ecological factor on parameters and results of development of minerals [6, 8]. Absence of account of this factor during organization, planning, planning and management of mining operations can result in serious negative economic and social consequences. The exact estimation of character of this factor and his displays in the concrete terms of development of deposits allows correctly to forecast all of its consequences (which can have catastrophic displays), plan, organize and develop economic activity of enterprises, providing high economic results at minimum negative influence on a natural environment.

Actuality of account of ecological factor in activity of mining enterprises especially increases in market economic conditions in connection with the necessity of decision of contradictions of economic task on a joint «nature-market». This task arises up in connection with natural incuriosity of business enterprises in the investment of financial means in nature protection measures, for lack of line arrived, to prolongation in time of offensive of responsibility for the inflicted ecological harm, lacks of coincidence of interests of enterprises and recipients (population, other enterprises, state). The special attention is required by the questions of management the processes of technological innovations, as the last not only determine affecting of production natural environment, but indissolubly related to control of inventories of natural resources and their rational use (booty without losses and decline of quality), that determines the economic results of development straight.

Market relations stipulate the necessity of consideration of ecological problems of mining production from point of ecologically-economical approach. It is special underlined in conception of steady ecologically-economical development, formulated in the «Global program of actions - Notice on 21-th age», accepted at conference «environment and development», conducted under an aegis UNO (Rio de Janeiro, 1992). Positions of this program are required by introductions of the system of estimation of activity of industrial enterprises from point of prevention of possible negative ecological consequences from their functioning. Thus, grounded, that achievement of the put purpose is impossible a way only technological development, for this purpose it is necessary to subordinate it achievement all of innovative activity, because ecological problems engulf all of complex of technological, technical, organizational, scientific, economic aspects of production. Only by the complex going near his innovative development it is possible to attain balance as between society, production and natural environment.

More justified from the economic point of view is other going near the decision of ecologically-economical problem, namely is the ecologically oriented restructuring of industries of industry of exploiting natural resources. Under restructuring the change of character and methods of production-economics activity of enterprises is understood. The purpose of such restructuring is:

– minimization of volumes of engaging in exploitation of natural resources (supplies of

deposits) at the receipt of necessary amount of commodity products;

– reduction of volumes of wastes at the production of basic goods forget of the most complete extraction of useful component from the obtained source of raw materials;

– application of technologies, eliminating harmful influences on an environment at implementation of technological processes (for example, passing to the biological kinds of fuel, nonexplosion separation of useful mineral etc.), in case formation of wastes the last must in good time join in the single production chain of their use as sources of raw materials for other productions.

Innovative activity of enterprises in the conditions of restructuring must execute the followings functions: acceleration of structurally-technological alteration of production; decline of ecological risks at introduction of innovations; increase of level of skilled and scientific and technical potential; providing of co-operation of science, production and financial-credit sphere. Taking into account the last function evidently, that «ecologisation» process of structurally-technological alteration of enterprises must be examined in indissoluble connection with innovative and investment activity.

It is necessary to mark that besides realization of the ecologically oriented restructuring of basic production of industrial enterprises, a large value is acquired by reformation and development of market mechanisms of ecologisation, namely creation of favorable organizationally-economic terms for an innovative enterprise in area of ecologically safe production. From all of types of innovative activity their special kind was already selected in this direction – ecologically clean technologies. With every year amount of users ecologically grows clean products in the whole world, including in Ukraine. A basic task here consists of creation of terms, when enterprises, realizing such technologies, will be able to get an economic effect from their activity commensurable with the sizes of capital financial investments in a production.

### *3. An economically-lawful mechanism of providing of activity is in ecologically defense activity of mining enterprises*

A large value in ecologically-economical direction has legal base. Due to realization of effective economically-lawful mechanisms of management an economy such terms of production

activity of enterprises, at which to the managing subjects is economic advantageous to observe a nature protection legislative base, reduce the level of harmful influence on a natural environment, must be created, to warn (but not to liquidate) his appearances, search the methods of rationalization of production due to the use of new resources-saving and ecologically defense technologies of mining, and also technologies of processing of its by-products.

The economic mechanism of ecological management, certain the base laws of «About to the guard of natural environment, operates in Ukraine». Due to the economic instruments of this law bases of requiring payment natureusing and economic tool are worked comes forward the unique mean, allowing to provide the receipt of financial resources, necessary for the removal of harmful influence on a natural environment. However, the substantial lacks of domestic economic mechanism of ecological management are the followings: he is unable to interest commodity producers in conducting of nature protection measures due to the personal money funds; not corresponds with other economic indicators and levers of economic activity; it is not enough operatively and effectively reacts on the dynamics of economic and ecological processes in the state.

Presently positive tendencies, directed on introduction of conclusions of conception of steady ecologically-economical development, register in the industrial regions of Ukraine. It means that the process of gradual building (integrations) of ecological factor began in the system of modern production, and also in the economically-lawful mechanism of functioning of market. An ecological enterprise develops as a result of it, and, consequently, the market of ecological business is formed. That the sphere of ecological technologies becomes the object of profitable commercial activity. As a result of it there is a certain infrastructure, including a few independent directions business of activity in area of mining production, main from which followings:

- creation ecologically of safe and resource-saving technique and technologies of realization of development, providing a high performance and economic efficiency of implementation of technological processes at minimum negative influence on a natural environment;

- utilization of wastes of processing of obtained useful minerals (wastes of production) as sources of raw materials for other productions;

- use of the materials got in passing;
- production of devices for control of the state of environment;
- ecological reproduction.

#### *4. Direction of utilization of wastes of mining production and his economic value*

It is necessary to mark that mining industry of Ukraine and its enterprise carry monoproduktive character (booty of one concrete mineral at development of deposit) mainly, which the far of hard, liquid, gaseous and aerosol wastes appears at. That mastering of deposits carries complex character neither on the use of the obtained source of raw materials nor on the use of the materials got in passing. In accordance with conception of steady development its converting must one of actual directions economic activity of enterprises of this production become into multifoood [1].

Results of theoretical, experimental researches and experimental tests, showed that a multifoood production at the complex mastering of deposits was the substantial factor of decline of basic unit of mining production cost, because the additional types of commodity sources of raw materials turn out in this case. Due to this factor the prime price of basic commodity raw material goes down on 10-20% and more. Pre-condition of drawing on this reserve is a presence on Ukraine from the developed industrial infrastructure of potential users of passing products and their participating in investing of projects of utilization of the materials got in passing from a mining production.

Development of industry of processing and utilization of wastes on modern technical and technological basis in combination with the innovative model of steady development allows complex to decide the ecological, economic and social questions of alteration of economic mechanism of mining industry. To the most essential constituents of this aspect behave: engaging of the second raw material in an economic turn; development of the specialized powers on processing of wastes; issue of the special equipment for utilization of wastes; production of new types of products (build materials, fuel bricks, methane and other); introduction of control the system by utilization of wastes within the framework of created technoparks and innovative-technological centers; increase of technological level of basic production of mining enterprises due to introduction of front-

rank scienceful technologies; conducting of the special research works on the having a special purpose programs; creation of new workplaces [19, 20].

By priority direction of development industry of processing of wastes, infrastructures of its service on the basis of progressive scienceful technologies there is creation of technological parks (techoparks).

## CONCLUSIONS

Arising up lately in the basic mining regions of Ukraine the serious problem of the extraordinarily high technogenous loading on a natural environment demanded decision of a number of tasks, directed on providing of possibility of the further large-scale and economic effective mining at the maximal decline of display of harmful for ecology production factors.

The analysis of terms which resulted in such consequences, and also economic and technological feasibilities which are possessed by the scientifically-industrial complex of Ukraine, executed authors showed that this problem can be decided. Its decision must be carried out on the basis of the new going near methods and organization of functioning of mining industry and its enterprises.

Complication and many-sided nature ecologically-economical problems so high, what only during complex realization of measures on all of the indicated directions realization ecologically of safe mining production is possible in activity of mining industry and its enterprises.

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#### КОНЦЕПТУАЛЬНЫЕ ОСНОВЫ ОРГАНИЗАЦИОННО-ТЕХНОЛОГИЧЕСКОГО ОБЕСПЕЧЕНИЯ ЭКОЛОГИЧЕСКОЙ БЕЗОПАСНОСТИ ГОРНОГО ПРОИЗВОДСТВА

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Аннотация. В настоящее время в горнодобывающих регионах Украины сложилась неблагоприятная ситуация, обусловленная высокой техногенной нагрузкой на окружающую природную среду за счет интенсификации процессов добычи минерального сырья, что ставит регионы перед угрозой экологической катастрофы. В этой связи особую остроту приобретает проблема развития новых подходов к совершенствованию технологии добычи с целью обеспечения минимизации экологических рисков при возрастании экономической эффективности производства. В данной статье авторами рассматриваются вопросы развития концептуальных основ современного подхода к организации экологически безопасного горного производства.

Ключевые слова. Концепция, развитие, горная промышленность, технология, эколого-экономический подход, экологическая безопасность.