

THE CONCEPTUAL FOUNDATION OF HARMONIZATION OF DIMENSIONAL DESIGN SOLUTION WHILE PLANNING AND WORKING OUT OF COAL-GAS DEPOSITS BY UNDERGROUND METHODS

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Introduction. Following the 25th World Mining Congress in Astana, it is concluded how important the coal mining industry nowadays. There are only a few energy sources that can produce heat and electricity day-and-night. Each source of energy has its own pros and cons. Ukraine, like any other country, faces difficulties using nuclear power. There are several major players in the oil and gas market. New renewable energy sources generate electricity only when there is a wind or sun. Traditional hydroelectric power stations have physical constraints, and biofuel use is not feasible as it is competing with the food industry.

According to the United Nations Economic Commission for Europe, fossil fuels will remain the main component of the future global energy balance. Sustainable Development Goal of United Nations on affordable and clean energy was the subject of recent debates organized by EURACOAL in the European Parliament. Everyone had agreed that coal will remain an important source of energy throughout the world during the energy transition in Ukraine, Germany, Turkey, India, China, and many other coal importing countries.

The tendency of world coal consumption to 2050 in the light of the Paris climate agreement COP21 is a real light of the heat power energy of the planet Earth [1, 2]. According to analytical forecasts, world coal production in 2050 will consist of more than 9 bill t (+17% to 2016).

Purpose. Prolonged restructuring is determined by the development of thermal power sector countries across the world and the conception of improving the environmental problems associated with coal mining activities. In present time coal and gas refuse in one day is impossible, it will lead to energy collapse in our state.

Ukraine coal reserves characterized by a thin geological thickness, only 20.4% are seams with a thickness more than 1.2 m, 74% is 0.71 – 1.2 m and 33.3% is less than 0.71m. More than 50% of all Ukrainian coal is mined at the mines of DTEK Pavlogradugol, where the average dynamic thickness of the developed reserves is 0.87 m [3]. This is the lowest figure among coal deposits that are exploited in the developed countries of the world. In addition, significant risks in coal mining create high methane content of the seams. Refusal to develop such seams will lead to the closure of many coal-mining enterprises in our country.

Thus, for the timely mine fun renewal, planning of new integrated industrial objects of the XXI century is required and put into operation their capacities which

will provide thousands of workplaces for decades [4]. With recovery rate increasing and the introduction of harmonious planning 0.4 – 0.5 m coal seam development using state of the art techniques and technologies we safeguard ourselves future supporting the enterprises adjacent to the mining towns and providing social and living conditions in these regions.

Unfortunately, in recent years, in underground mining of strata deposits is seldom or there are no deeply worked out scientific substantiation of design decisions in the planning and working out of coal-gas deposits. Often, everything comes down to programming and plans, which are called strategic planning, which is privately owned. Science comes to nought due to a lack of funding, through the internal private policy of non-disclosure and immersion in the abyss of coal industry chaos, the collapse of targeted project planning institutions. Until recently, the design and planning of optimal quantitative and qualitative parameters of mines were carried out on mining technical capabilities of technology and economic calculations based on statistical data, or the mathematical-analytical method using extreme properties of functions.

Methodology. The work objective is to create scientifically grounded methods for designing new horizons of mining enterprises for harmonious complex mining of mineral deposits with significantly lower capital and operating costs [5-10]. To achieve the work objective a set of methods is used, such as mathematical statistics, stochastic factor analysis, heuristic methods of Hurwitz and Engelmeier theory of optimism and pessimism, method of inversion and simplex method complementing each other, planning of complex ergodynamic systems of the space-time continuum, method of research of operations, and solving of multicriteria problems.

The scientific significance of the work is to develop the scientific principles of the harmonization of spatial and planning decisions as an effective interaction of agreement and smoothing, minimizing the contradictions caused between the elements of the systems of preparation and development in the space-time continuum and the methodology of coal mining enterprise planning in XXI century.

On the basis thereof, the harmonious work of the coal industry and its strategic role in ensuring energy security and economy of the country is an important priority.

Keywords: underground mining, design, planning, engineering solutions, innovations

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DEVELOPMENT OF COMPUTING MODEL OF GEOMECHANICS SYSTEM «LAYERED MASSIF - WORKING SUPPORT» AT PHYSICAL PARAMETERS OF ROCKS

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Purpose. Substantiation of method forecasting of manifestation rock pressure in the system «layered massif – working support» based on the detection of patterns displacement any point of circuit the preparatory working during the simulation experiments.

Methods. Carrying out the simulation experiments were performed on the basis of the finite element method using the solid computational domain, provided