

Application of New Safe and Economic Technologies of Development of Coal Layers on the Shelf in the South of Primorye Territory

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ABSTRACT

A brief description of occurrence of deposits on the shelf of the Far Eastern seas is adduced. The special attention is given to the occurrence of coal layers on the shelf in the south of the Sea of Japan, provisional stocks of coal, being under sea bottom are given. New safe and economic technology of development of sea deposits without infringement to ecology of sea bottom is offered. The data of mathematical researches of parameters of technology of development of sea deposits depending on depth of the sea are adduced. An experimental site for realization of coal productions on new technology is recommended.

KEY WORDS: shelf, gravel deposit, titanium-magnetite, coal layers, sea bottom, technologies, parameters of development.

INTRODUCTION

Deposits of titanium and magnetite and gold bearing sand, and also coal layers, stretching under bottom of the sea of developed deposits are occurred on the shelf of the Far Eastern seas and, in particular, in the south of the Sea of Japan of Primorye Territory.

The basic technological principle of development of the technological decisions in the projects of the mining marine enterprises, carrying out mining of sea deposits, should be strict observance of the ecological requirements, excluding negative influence of extraction on flora and fauna of areas of water.

One of such technologies is mining with holes, providing preservation of bottom spaces at the expense of use of carrying capacity of interhole pillars. The basic design data of the given method, determining stability of underworking width are width of the chamber and width of interchamber pillars.

THE GENERAL PROVISIONS

Significant stocks of coal, ore and gravel useful mineral occur on the shelf of the Far Eastern seas. The most perspective for industrial development from among reconnoitered deposits are the provinces of titanium-magnetite sand, located near to the coast of Kamchatka, of the Kuril Islands, on western shelf of Tartar strait, gold bearing sands and coal layers in shelf zone in the South of Primorye Territory.

Titanium-magnetite placers and coal deposits of the Far

Eastern seas occur in regions with high biological efficiency of sea bottom, areas of water and coast, included in protected zones of renewed natural resources. It causes special urgency of development of ecologically acceptable technologies of production, allowing to ensure steady functioning of ecology system in the region of mining.

Since 1994 the Research workers of the Department of Mining Useful Minerals of Mining Institute of the FESTU and Joint-stock Company "Primorskugol" have been carrying out work on applications of new technologies with a method of hydrolic mining with holes of coal layers, occurred under bottom of a Amur gulf (Uglovaya bay) up to 40 mln t and stocks of suite of seams on the shelf of Ussuriyskiy Gulf (up to 200 mln t).

RESEARCH AND DEVELOPMENT OF PARAMETERS OF NEW TECHNOLOGIES OF PRODUCTION OF HARD USEFUL MINERAL ON THE SHELF

The analysis of experimental researches shows, that at the ratio of the minimum size of the fulfilled area to depth of work, exceeding 0,8, the calculation of width of pillars can be done proceeding from complete weight of covering rock and water width, for example, according to the method of Sheviakov for pillars in the form of a pole [Niskovskiy et al, 1995, Niskovskiy et al, 1997].

More complex problem is determination of chambers width, the roof of which is exposed to flexural strain, accompanying with the occurrence of normal (tensile and compressing) pressure. Owing to physical anisotropy of condensed titanium-magnetite sand the greatest danger to stability of underworked width is represented by tensile stress, causing process of cracking. Under usual conditions disturbance of continuity of a rock mass in some located areas where the level of stress exceeds strength parameters of rocks are allowed. At underworking of sea bottom cracking in overburden will not entail immediate loss of the carrying capacity of the roof. Significant forces of friction on surfaces of contacts of rock blocks will interfere that. However, the areas of friction contacts will decrease, and the pressure on them - to be increased in view of duration of load action, filtration of water in cracks, rendering negative influence to physical and mechanical properties of rock mass, and further lowering of roof. The destruction of rocks here will take place as a result of compression of rocks under action of high