

**Geomechanical assessment of geotechnology at a project stage of underground ore mining**

**Information about author**

**A. M. Freidin**<sup>1</sup>, Chief Researcher, Professor, Doctor of Engineering Sciences  
**S. A. Neverov**<sup>1</sup>, Senior Researcher, Candidate of Engineering Sciences, [nsa\\_nsk@mail.ru](mailto:nsa_nsk@mail.ru)  
**A. A. Neverov**<sup>1</sup>, Senior Researcher, Candidate of Engineering Sciences  
**A. I. Konurin**<sup>1</sup>, Junior Researcher, Candidate of Engineering Sciences

<sup>1</sup> Chinakal Institute of Mining, Siberian Branch, Russian Academy of Sciences, Novosibirsk, Russia

**Abstract**

Based on the systematized experimental evaluations of the mechanical conditions, tectonic structures and physico-mechanical characteristics of rock masses, the authors have developed forecasting procedure for stress-strain state versus depth of rocks. The boundary conditions determined to correctly formulate applied geomechanical problems minimize uncertainties and errors of mine planning. The research findings have enabled typification of geomechanical conditions for ore bodies and classification of tectonic types of rock masses and the related models of rock masses based on type of their stress state. Application of rock mass models at the mine planning stage allows advanced reliability of selection of safe technology and its parameters for underground ore mining.

The offered approach has been tested in planning of steep gold ore mining down to a depth of 800 m and more below ground surface. The stress-strain state forecast and geomechanical assessment of ore extraction technology using sublevel drifts at a depth of 800 m shows that the design parameters of the mining system meet the safe mining standards: safety pillars, crowns and pillars established between material handling declines have safety factors 1.3, 1.4 and more than 1.25, respectively.

The main tool of the procedure is the classification of tectonic types of rock masses relative to their stress state and the design models of rock masses.

It is intended to use the procedure at the stage of deep mine planning in order to assess all solutions and select safe geotechnologies, designs and parameters for ore mining based on criteria of structural weakening and strength of rocks.

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**Keywords:** Rock mass, depth, geological structure, stress state, classification of geomechanical structures, methodology, geotechnology, overburden pressure, stability, safety.

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## ПАМЯТИ БОРИСА ИВАНОВИЧА СМИРНОВА



С глубоким прискорбием сообщаем, что на 83-м году жизни скончался Борис Иванович Смирнов — известный специалист в области автоматизации горно-обогатительного производства, заместитель генерального директора ОАО «Союзцветавтоматика», член редколлегии «Горного журнала».

Выпускник Московского института цветных металлов и золота им. М. И. Калинина, Б. И. Смирнов около 60 лет проработал в системе цветной металлургии страны. При его непосредственном участии и под его руководством осуществлялось проектирование и внедрение систем автоматизации производственных процессов на Гайском, Учалинском ГОКах, комбинатах «Ачполиметалл», «Североникель» и других предприятиях отрас-

ли. Его новаторские разработки отражены в многочисленных статьях и изобретениях.

С 1989 г. Борис Иванович трудился в редколлегии «Горного журнала». При рецензировании статей главным приоритетом для него была их практическая полезность и глубина проработки исследуемого вопроса.

Производственная и общественная деятельность Б. И. Смирнова отмечена орденом Трудового Красного Знамени и медалями, рядом ведомственных знаков отличия.

Светлая память о Борисе Ивановиче Смирнове, отличном организаторе, профессионале высокого класса, сохранится в сердцах его коллег по работе.

*ОАО «Союзцветметавтоматика»,  
редколлегия и редакция «Горного журнала»*