

CONTENTS

Underground mining

- Glotov V.V., Pakhaluev B.G.** PHYSICAL MODELING OF HYDRAULIC CLEANUP OF EXTRACTION BLOCKS IN INCLINED ORE BODIES 5
- This article contains the information devoted to the new kerving cuts mounting method during the tight rock and hard-shot ground roadheading. The authors offer to apply the kerving formed with a special spiral-shaped blast-hole instead of well-known angled and box cuts, which include several rectilinear blast-holes. The article also reveals the results of spiral kerving actual tests with different operation factors which confirm its real effectiveness while using.*
- Key words: the utilization factor of the trac; the trace of a spiral; drilling unit; experienced explosions.*
- Dolganov A.V.** SLURRY OF COPPES AND PYRITES PITS: PROBLEMS AND WAYS OF DECISION 10
- The article raises the problems of transportation of copper and pyrites slurry to are dressing mills with the purpose of extraction of valuable components. The article describes the influence of slurry on the operation of mine dewatering system.*
- Key words: dewatering, copper and pyrites underground pit, gidroelevatornaya installation, main dewatering, system, mechanization.*
- Kazanin O.I., Sidorenko A.A., Sementsov V.V.** GEOMECHANICAL PARAMETERS DETERMINATION OF SUBLEVEL CAVING MINING SYSTEMS FOR THICK STEEP COAL SEAMS OF PROKOPEVSKO-KISELEVSKOYE DEPOSIT 15
- The results of finite element researches of the stress-strain state of the rock mass and its development during the mining of the thick steep coal seams of Proko-pevsko-Kiselevskoye deposit with sublevel caving mining systems are given in the article.*
- Key words: underground mining, thick steep seams, sublevel caving, stress-strain statement, parameters determination.*
- Kazanin O.I., Sidorenko A.A., Tyurnin V.A.** ESTIMATION OF THE MINE TECHNICAL FACTORS INFLUENCE ON SPONTANEOUS COMBUSTION HAZARD DURING MINING OF COAL SEAMS SERIES 22
- The regulatory documents of spontaneous combustion coal seams mining were analyzed. The possibility of forming the aerodynamic coherency between gobs of developing coal seams at Alardinskaya coal mine and spontaneous combustion hazard were evaluated.*
- Key words: superimposed seams, gob, spontaneous combustion, endogenous fire, aerodynamic coherency.*
- Kozyrev A.A., Semenova I.E., Zemtsovskiy A.V.** ANALYSIS OF ROCK BURST REALIZATION CONDITIONS IN THE RASVUMCHORRSKIY MINE OF "APATIT" JSC IN 14.02.2012 28
- The results of numerical research of stress-strain state with the actual mining state during rock burst in the Rasvumchorrskiy mine of "Apatit" JSC in 14.02.2012 are presented. The stress redistribution in the contour rock mass after relief boreholes drilling was analyzed. The optimum angle for repeated drilling of relief boreholes row is proposed.*
- Key words: stress redistribution, stopping, numerical modeling, rock burst hazard, rock burst, relief boreholes row.*

Savitch I.N., Ishzhenko V.L. SUBSTANTIATION OF THE DESIGN PARAMETERS FOR SUBLEVEL CAVING WITH FACE DRAWING OF CHROMITE ORE.....	34
<i>To substantiate rational parameters of sublevel caving system in the development of unstable, prone to small fraction fragmentation chromite ore were investigated and recommended variant of the mining system.</i>	
<i>Key words: chromite ore, sublevel caving, modeling, draw figure, the parameters of the mining system, extraction indicators.</i>	
Prokopov A.Yu., Prokopova M.V., Tkacheva K.E. RESEARCH OF CHANGE INTENSE-DEFORMED CONDITIONS OF FAST SUMPS AT DIFFERENT OPERATIONAL PHASES AT DEEPENING OF VERTICAL SHAFTS...	37
<i>Mathematical modeling of work concrete is executed fix a sump of a vertical shaft of mine. The analysis of change intense-deformed condition is made fast and rock, after water pumping from a sump and deepening a shaft.</i>	
<i>Key words: concrete fast, shaft deepening, the mathematical modeling, the intense-deformed condition.</i>	
Prosvetova A.A., Melnikov E.K. SELECTION GEODYNAMIC DANGER ZONES USINSK COAL DEPOSIT	42
<i>Method geodynamic zoning is today an integral part of the engineering-geological surveys at the stage of exploration work prior to working out of deposits. The article shows a diagram of geodynamic zoning mine take Usinsk coal deposit. Constructed with the geodynamic map will minimize costs and increase the safety of mining operations.</i>	
<i>Key words: coal, geodynamics, zoning, morphostructural analysis, faults, maps.</i>	
Rakhimbekov S.M. OPTIMIZATION OF DESIGN PARAMETERS OF CLEARING BLOCKS	46
<i>This project offers modern approaches for the development of mining technology, taking into account the most promising development of classic rock technology, based on the maximum use of information resources of nature and technical system.</i>	
<i>Key words: technology, treatment works, blocks, a system developed-processing, new mining technology.</i>	
Semenova I.E., Avetisyan I.M. PRELIMINARY ESTIMATION OF CAVING AND SUBSIDENCE AREA DURING MINING OF PERSPECTIVE EVESLOGCHORR DEPOSIT	51
<i>The results of probable caving and subsidence area estimation during mining of perspective Eveslogchorr deposit are presented. The estimation was carried out considering the compound surface relief and rock mass tectonic stress. The results were included in technological regulation that establishes the rules of Plato Rassvumchorr deposit mining by Tsentralny open pit. The dumps of the open pit are located directly above Eveslogchorr ore body.</i>	
<i>Key words: caving, subsidence, cap rocks, stress state, mathematical modeling, underground mining, rock dumps.</i>	
Sokolov I.V., Smirnov A.A., Antipin U.G., Baranovsky K.V., Nikitin I.V., Shirokov M.A. GROUNDING UNDERGROUND GEOTECHNOLOGY OF THE SARBAISKY IRON ORE DEPOSIT COMBINED MINING.....	58
<i>The efficient variants of underground mining system of under-open pit reserves of the Sarbaisky iron ore deposit are grounded in terms of the analysis of mining-geological and mining-technological conditions. The technology of the Sarbaisky</i>	

iron ore deposits' specific areas is worked out and the extraction and principal technical-and economic indices by the variants are defined. Key words: underground geotechnology, preparation-cutting operations, stoping extraction, mining system, ore and enclosing rocks' fall.	
Sokolov I.V., Smirnov A.A., Antipin U.G., Nikitin I.V., Baranovsky K.V. THE DIRECTIONS AND PRACTICE OF UNDERGROUND GEOTECHNOLOGY APPLICATION IN THE URALS MINES USING SELF-PROPELLED FACILITIES.....	66
<i>Principal directions of improving underground mining technology in terms of self-propelled facilities application are formulated. Technical and technological solutions permitting to raise the efficiency of underground and combined mining of a number of the Urals' deposits are worked out and introduced.</i> Key words: self-propelled facilities, deposit development, mining system, copper-pyrite deposit.	
Turtygina N.A., Fennich V.V. MODELING PRECONCENTRATION OF DISSEMINATED COPPER-NICKEL ORE IN UNDERGROUND MINING	75
<i>The authors discuss studies of ore flow in Zapolyarny Mine and, based on the calculated data, evaluate technological variability of low-grade copper-nickel ore quality.</i> Key words: ore, quality control problem, composition, underground mine, control.	
Fam Van Tkhyong DEVELOPMENT RECOMMENDATIONS FOR SUPPORTING TUNNELS IN MINES BASE ON ANALYTICAL AND EXPERIMENTAL RESEARCHES	78
<i>The article refers the recommendation supports for tunnels in underground mines in the geological conditions in Khe Tam mine in Quang Ninh province Viet Nam.</i> Key words: underground and mining construction, rock pressures on the supports in tunnels in underground mines.	
Chirkov S.E., Limanskiy A.V., Lunyakov V.A. ACTIVATION OF PROCESSES OF DISPLACEMENT OF A MASSIF WHEN FLOODING COAL MINES AS A RESULT OF CHANGE OF PROPERTIES OF THE EARNED ADDITIONALLY ROCKS AT WATER SATURATION	81
<i>Influence of water saturation on physico-mechanical properties of sandstones is considered in the article with the emphasis on change of angle of internal friction under water saturation. The author shows that angle of internal friction decreases under water saturation, which causes subsidence trough growth and other damages during mine abandonment by flooding.</i> Key words: activation of processes, rock properties, water saturation.	
Yanchenko G.A. ON MIXING OF GAS STREAMS WITH DIFFERENT THERMODYNAMIC PARAMETERS	88
<i>Mixing of thermodynamically different gas flows is analyzed. The author proposes procedure for calculating mass rates of original gas flows in the mixture in order to generate gas mix flow with the desired thermodynamic parameters.</i> Key words: gas, flow, mixing, pressure, temperature, flow rate.	
Open mining works	
Avdeev P.B., Oveshnikov Y.M., Kuzhikov A.A. FEATURES OF THE SITE IMPROVEMENTS ZUGMARSKOGO TIGNINSKOGO COAL MINE AFTER REKONSERVETION	100
<i>The article describes the features of the site improvements Zugmarsky Tigninsky coal mine after rekonservatsii, give a brief description of the geological field. The technology of production, the sequence of training facility for commissioning.</i> Key words: coal mine, cut, rekonservatsiya, completion.	

- Gavrishev S.E., Burmistrov K.V., Tomilina N.G.** JUSTIFICATION OF THE TECHNOLOGICAL SCHEME OF OPENING OF DEEP HORIZONS OF QUARRIES WITH THE USE OF HIGH-ANGLE LIFTS IN THE COMBINED METHOD OF FIELD DEVELOPMENT **108**
- In article the expediency of application steeply lifts in quarry is proved at the combined way of working out of deposits. Authors change of the scheme of opening with the device conveyor or open-pit the lift in quarry for the purpose of increase of efficiency of the combined working off of deposits is offered.*
- Key words: combined development, completion quarry, conveyor lift, skip.*
- Yel'chaninov E.A., Konnov V.I., Mikhailov R.A.** CHANGE OF THE EASTERN ZABAIKALIYE SMALL RIVERS FLOW DURING THE GOLD MINING **116**
- The results of research on changing of the Eastern Zabaikaliye small rivers hydrological condition during the gold-mine deposits output in their beds and floodlands are adducted.*
- Key words: gold deposits mining, small rivers, hydrological condition of rivers, river grade.*
- Ermakov S.A., Burakov A.M.** METHODOICAL RECOMMENDATIONS ABOUT THE CHOICE AND JUSTIFICATION OF THE RATIONAL COMBINATION OF METHOD OF OPEN-CAST MINING OF PLACER GOLD DEPOSIT OF THE RIVER B. KURANAH **123**
- The analysis of geological and quality of placer deposits productive contour of river B. Kuranah has been carried out. It is marked the significant range of their changes. Methodical approach to development of a scattering is reasonable and recommendations about ways of development, area of their application are made.*
- Key words: placer deposit, parameters, change, analysis, recommendations.*
- Kalmykov V.N., Gavrishev S.E., Burmistrov K.V., Gogotin A.A., Petrova O.V., Tomilina N.G.** NEW UNDERGROUND MINING APPROACHES JUSTIFICATION FOR THE MALIY KUYBAS OPEN PIT MINING OPERATIONS **132**
- The article considers the problem of choosing the actual scheme of opening career in finalizing Maliy Kuybas combined open-underground mining. The authors propose to change the method of opening an open-cast mine in the light of further refinement deposits underground.*
- Key words: combined open-underground mining method, technological schemes, conveyor, skip.*
- Miroshnikova L.K.** GEOLOGICAL-GEOCHEMICAL CRITERIA FOR ESTIMATION OF SULFIDE COPPER-NICKEL ORE BODY STRETCH **140**
- It is found that zoning of geochemical field of ore horizons fits with direction of axes of intrusive rock mass, direction of mineralization development, and with mineralogical zoning of ore bodies.*
- Key words: geochemical field, intrusive, ore horizon.*
- Oveshnikov Yu.M., Ryazantsev S.S.** MAIN TRENDS OF THE REMEDIATION WORK IN THE DEVELOPMENT OF ORE DEPOSITS ZABAIKALYA **151**
- Consider the negative impacts of surface mining at coal mines. The characteristic of the technology development and the effects of mining for Zhirekensky field. The methods of study ways reclamation plan allows the start remediation.*
- Key words: environment, reclamation, ore deposits, disturbed land, dumping of overburden.*

- Panishv S.V., Ermakov S.A.** CHOICE AND JUSTIFICATION RATIONAL TECHNOLOGICAL OF THE BEST TRANSPORTNY PARAMETERS OF TECHNOLOGY OF DEVELOPMENT OF THE BLOWN-UP OVERBURDEN BREEDS INCLINED TO REPEATED FREEZING **156**
- Results of researches of development of overburden breeds dragline in the conditions of repeated freezing of the blown-up mining weight are presented. On the example of Kangalassky coal mine parameters of excavator blocks are proved when developing overburden breeds.*
- Key words: permafrost, temperature regime, cycle, performance, dragline.*
- Umarov F.Ya.** ANALYSIS OF STATE OF CRITICAL ENGINEERING STRUCTURE IN MURUNTAU OPEN PIT MINE **162**
- The author has analyzed stability of Muruntau open pitwalls and found that rate of displacement of block structures in the open pit mine are far from being critical. The pitwall sites to be of special care during open pit mining are localized.*
- Key words: muruntau open pit mine, block structures, pitwalls, mining-and-conveying system.*
- Higher mining education**
- Petrakova N.N.** REVIEW OF AUTODESK GRAPHICS PACKAGES REGARDING THEIR APPLICABILITY IN THE ENGINEERING AND COMPUTER GRAPHICS COURSE..... **168**
- The article reviews Autodesk graphics programs AutoCAD and Civil. The author analyzes their options with a view to using them in the Engineering and Computer Graphics Course.*
- Key words: information technologies, graphics programs AutoCAD and Civil 3D.*
- The enrichment of minerals**
- Zhukov V.V., Sharikov Yu.V., Neuvonen M., Turunen I.** AN EFFECT OF GOLD CONCENTRATE PRE-OXIDATION TO THIOSULFATE LEACHING PROCESS **171**
- Nowadays development of more ecologic and economically reasonable method for gold ore and concentrate treatment gains in importance. Several countries abandon a gold production by cyanidation due to the disasters and high toxicity of the method. Utilization of sodium thiosulphate as leaching agent is challenging technology which is needed to assess effectiveness of the process. In the study assessment of pre-oxidation efficiency of gold concentrate to following leaching has presented.*
- Key words: pre-oxidation, leaching, thiosulphate, gold.*
- Kozlov V.A.** OVERALL PERFORMANCE OF MODERN JIGGING MACHINES AND FOUR-SPIRAL SEPARATORS IN SEVERNAYA PREPARATION PLANT ... **176**
- The article describes overall performance of jigging machines (Allmineral, Germany) and four-spiral separators in terms of their operation in Severnaya Preparation Plant, Berezovksy town, Kemerovo Region.*
- Key words: particle size distribution in coal, coal jigging, spiral separator, separation inaccuracy.*
- Kuskov V.B., Kuskova Ya.V., Nikolaeva N.V.** SULFUR REMOVAL FROM COAL ON CONCENTRATION TABLE **180**
- Sulfur is harmful impurity. Sulfur can be removed from coal using gravity, flotation, magnetic, electric and other methods. The article demonstrates effective removal of sulfur from coal on concentration tables, in particular, the new design tables—round spinning tables.*
- Key words: sulfur removal from coal, round spinning concentration tables.*

- Mikhailov A.G., Vashlaev I.I.** MODELLING OF PARAMETERS OF PROCESSES INFILTRATION OF TECHNOLOGY OF EXTRACTION OF PRECIOUS METALS FROM TECHNOGENIC OBJECTS **186**

Experimental works are performed for a basic parameters definition for offered extraction technology of precious metals at ascending solutions movement in a mining mass of enrichment rejects.

Key words: extraction, infiltration, anthropogenic object, modelling of parameters, precious metals.

- Nikitina L.G.** THE PROSPECTS OF THE USING NOT STATIONARY PROCESSES FOR THE SEPARATION THE FINELY DISPERSED ORE..... **191**

The problem on division small and fine fractions of the mineral resource on base of the produced technological distinction and offered separation's devices working in not stationary field of centrifugal power and allowing raise efficiency of the extract mineral resource is motivated and solved in this article.

Key words: field, man-made source, flotation.

Aerology

- Skopintseva O.V., Balovtsev S.V.** INTEGRAL ESTIMATION OF AEROLOGICAL RISK OF DAMAGES IN UNDERGROUND COAL MINE SITES..... **193**

The authors propose method for integral estimation of aerological risk of damages in excavation sites in underground coal mines based on hazard index of geological and geotechnical factors as well as insecurity index of the site ventilation schemes.

Key words: excavation sites of underground coal mine; aerological risk of damage; ventilation scheme insecurity.

Labour protection

- Smolin A.V.** REDUCTION IN PERSONNEL INJURY RISK IN MINES BASED ON CALCULATION OF MINING SAFETY INHIBITION PROBABILITY **196**

The author analyzes causes of mine safety inhibition and suggests on assessment of probability of mine occupational safety and health requirements to be violated.

Key words: safety requirements violation, systematic defects, injury prevention, forecasting.

Geotechnology

- Andrejko S.S., Lyalina T.A., Ivanov O.V., Nesterov E.A.** CRITICAL VALUE DETERMINATION OF GAS PRESSURE THAT CAN CAUSE GAS-DYNAMIC PHENOMENA OUT OF THE ROOF AT SYLVINITE LAYER EXTRACTION AT THE VERKHNEKAMSKOE DEPOSIT **200**

In carrying out the work geomechanical modeling of strain-stress state of entry roof rocks is conducted and the critical value stability of gas pressure in the free gas near-contact accumulation that can cause gas-dynamic phenomena out of the entry roof in sylvinite layer is conducted

Key words: potash mines, sylvinite layers, gas content, gas-dynamic characteristics, gas-dynamic phenomena, gas pressure, the critical value, the current anticipating.

- Andreiko S.S., Litvinovskaya N.A.** LOCAL FORECAST OF GAS BURST-HAZARDOUS ZONES ON THE FLOOR OF MINE WORKINGS IN STRATUM AB ON THE SOUTH OF BKPRU-4 MINE AT THE UPPER KAMA POTASSIUM SALT DEPOSIT **205**

The article analyzes events associated with gas bursts from the floor of mine workings located in stratum AB and make local forecast of gas burst-hazardous zones aiming at improvement of mine safety and cutting down costs of preventive degassing hole drilling.

Key words: gas bursts, sudden floor rock damages and gas emission, local forecast, 3rd order folds, curve of fold, Upper Kama potassium salt deposit, BKPRU-4 Mine, stratum AB, stratum Kpl, gas burst source area, free gas, foliation, strike joints, cross joints, gas content, initial gas emission velocity, gas burst source mechanism.

The combined development of the fields

Leontiev A.A., Belogorodtsev O.V., Gromov E.V., Kazachov S.V. DEEP LEVELS OPENING BY THE UNDERGROUND WORKINGS AT THE ZHELEZNY MINE, KOVDORSKY GOK **212**

The paper proposes feasible schemes of the deep levels opening by underground haulage workings and carries out their feasibility study.

Key words: opening scheme, underground workings, transport scheme, technological equipment for transport system

Ladeyshzhikov S.V. ESTIMATION OF THE POSSIBLE SPACE SYSTEMS IN SHALLOW SEISMIC SURVEY..... **223**

Main parameters of three-dimensional systems (3D) for shallow seismic survey on the Upper Kama Potash Deposit are calculated. The assessment of use survey 3D systems opportunities for the solution of geological tasks in the range of shallow depths is given.

Key words: shallow seismic survey, three-dimensional systems, bin, fold.

Measurement, control, diagnostics

Adushkin A.V. MEASUREMENT CONVERTER FOR THE MONITORING OF RESIDUAL DISPLACEMENTS IN MINE WORKINGS..... **229**

Design of transducer for residual displacement measuring in underground openings is discussed. Mechanical deformation is resulted in changes of interference pattern of polarized light in polariscope.

Key words: rock, photoelasticity, geomechanical monitoring and wells.

Anisimov V.M. EVALUATION OF STRENGTH PARAMETERS OF THE BEAMS OF THE B-2 IN THE BUILDING OF THE EKATERINBURG STATE CIRCUS ON DATA OF EXPERIMENTAL STUDIES AND THEORETICAL CALCULATIONS..... **232**

The comparative analysis of theoretical calculations and experimental data of one of bearing beams of a console design of a surface building is made. The assessment is given to strength parameters of a bearing beam of the building.

Key words: geoinformation systems, strength, load-bearing beams, fracture, the control of the state of reinforced concrete structures, oblique fractures.

Borisenko D.I. TO THE QUESTION OF MODELLING OF CHANGE OF HEIGHT OF THE BURNING COAL WALL **241**

Experiment on measurement of change of the vertical size of samples of coal at heating by an open flame and simultaneous compression in a vertical direction in laboratory conditions is described that models behavior of a burning coal wall at an underground fire in a coal layer. Typical experimental dependences of change of height of the sample of coal and external compression at time are resulted.

Key words: the sample of coal, expansion at heating, the linear sizes, modeling of a coal wall.

Dorokhin K.A., Boyko O.V. GEOPHYSICAL STUDIES OF LANDSLIDE PROCESSES IN THE AREAS OF RAILWAY TUNNELS PLACEMENT	247
<i>The article is devoted to the existing problem analysis and assessment of landslides. Successful in solving the problem of estimating the geodynamic state and further analysis of the stability of the array, the method seismic KMPV. In analyzing the results of which can not only monitor the changes in the slope of the landslide, but also to assess the risk of their displacement.</i>	
<i>Key words: geodynamic state seismic, refraction method, longitudinal wave (Vp), sliding slopes, the wave speed, loose rock.</i>	
Kazanin O.I., Yutyaev J.P., Ermakov A.Y. THE ORGANIZATION OF CONTINUOUS CONTROL OF THE ROCK BOLTS STATEMENT IN THE ROADWAYS AT JSC «SUEK-KUZBASS» COAL MINES	253
<i>The necessity of continuous control of the rock bolts statement in the roadways is founded and the main tasks for such service at the coal mines JSC «SUEK-Kuzbass» are determined in the article.</i>	
<i>Key words: coal mines, roadways, rock bolts, statement control.</i>	
Kazanin O.I., Mustafin M.G., Meshkov A.A. ANALYSIS OF CAUSES OF GROUND SURFACE SINK HOLES DURING EXTRACTION OF BAIKAIMSKY COAL BED IN KRASNOYARSKAYA MINE, SUEK-KUZBASS JSC	257
<i>The article describes studies of stress-strain state of rocks and displacements of ground surface caused by Baikaimsky coal bed mining in Krasnoyarskaya Mine, SUEK-Kuzbass JSC. The causes of ground surface sink holes are shown.</i>	
<i>Key words: coal bed, ground surface undermining, displacement of rocks, stress-strain state of rocks, computer modeling.</i>	
Mukhametshin A.M., Anisimov V.M. STATE OF THE MAIN LOAD-BEARING STRUCTURAL COMPONENTS OF A CIRCUS BUILDING IN THE CONTEXT OF THE STRENGTH THEORY	262
<i>Analyses the state of cantilever beams B-2, which is the main bearing element of a unique building in the presence in it of a thin-walled parts of residual deformations. It is shown, that at repeated many times changing loads of residual deformations may develop.</i>	
<i>Key words: plasticity, failure, theories of strength, mechanical strength, statistical theory of strength, solid body, concrete, reinforced concrete, permanent strains, repeated loading.</i>	
Mukhametshin A.M., Ignatenko A.N. MONITORING OF CONDITION AND RUNNING MODES OF MINING INSTALLATIONS AND ACTIVITIES USING GEOINFORMATION MMM-SYSTEM	267
<i>The article describes MMM-system meant for continuous monitoring of equipment conditions and mining process status and handling various engineering, technological and exploration problems in mining and processing industry.</i>	
<i>Key words: magnetic intrusion detectors, monitoring system, magnetometer, digital signal controller, ferroprobe.</i>	
Nikolenko P.V., Tsarikov A.Yu. EXPERIMENTAL SET-UP FOR MECHANICAL AND ACOUSTIC EMISSION TESTING OF COMPOSITE MATERIALS	273
<i>Description of developed laboratory set-up for uniaxial loading of composite materials with simultaneous acoustic emission registration is given. The results of computer simulation of individual parts of experimental set-up are submitted.</i>	
<i>Key words: laboratory set-up, acoustic emission, uniaxial loading, composite materials.</i>	
Panin V.I., Rybin V.V., Konstantinov K.N., Starcev Yu.A., Danilkin A.A., Kozhuchovskiy A.V. MONITORING OF ROCK MECHANICS SETTING IN THE OPEN PIT WALL BY GEOPHYSICAL METHODS	279

The paper presents findings of long-term continuous geophysical research of the rock mass mechanics state. The results are given of stress-strain state determination, assessment of elastic characteristics of the rock mass by the ultrasonic method, velocity models of the open pit wall section monitored by the seismic-tomographic method. It has been confirmed that the rock mass is hierarchically-blocked environment with acting gravity-tectonic stress field. An important part of geophysical control methods is shown during rock mechanics state assessment in the open pit wall.

Key words: rock mechanics, open pit wall, stress-strain state, geophysical methods, mining safety.

Trembitsky A.L., Shatilo A.A. ANALYSIS OF SAFETY BARRIERS ON VOLTAGE REGULATOR DIODE UNDER RESISTIVE AND INDUCTIVE LOADS..... **286**

In work barriers of safety of a direct current with stabilizer diode protection for intrinsic safety circuits are considered. Influence on the minimal inflammable current of a ratio of a voltage of a feed and a voltage of stabilization of a stabilitron, and also parameters of circuits with barriers of safety with stabilizer diode protection is investigated.

Key words: barrier of safety, intrinsic safety circuit, an electric equipment.

Tsoi P.A., Panov A.V., Kolykhalov I.V., Semenov Z.V. FRACTURE GROWTH IN DISK-SHAPED ROCK SPECIMENS..... **296**

Based on laboratory experiment data and software-math modeling results, the authors study propagation of directional fracture on the surface of disc-shaped rock specimens.

Key words: experiment, modeling, fracture, Brazilian test, stress, strain.

Mining machinery, equipment and transport

Koryukov A.A., Karyakin A.L. A SIMULATION MODEL OF CAREER EXCAVATOR..... **302**

The simulation model of the shovel's electromechanical systems has created by MATLAB. The model allows to simulate transient processes in electromechanical systems of shovel in working cycle of mining machine.

Key words: simulation model, simulation, shovel, working cycle, MATLAB.

Sklyanov V.I. REDESIGN PROPOSAL FOR SURFACE DRILLING MACHINE A-50 FOR BACKFILLING HOLES IN THE NORILSK INDUSTRIAL AREA WITH THE OPTION OF DRILLING MACHINE INSTALLATION WITHOUT LANDFILL OPERATIONS **306**

The article discusses design of drilling machine A-50 allowing sufficient lifting of the drilling machine for arrangement of inclined chute above batchboxes, the requirements for sleigh foundation, method of the drilling machine mounting on the sleigh and principles of the sleigh foundation calculation.

Key words: drilling machine, inclined chute, sleigh foundation, landfill operations, take-in bridge.

Fedotov P.K. EFFECTIVENESS OF ORE FRAGMENTATION IN CONVENTIONAL PRETREATMENT VERSUS BULK FRACTURE **309**

Aimed at comparing disintegration effectiveness reached in bulk fracture and conventional ore pretreatment, different schemes of ore pretreatment have been simulated in laboratory conditions. The effectiveness comparison criteria are determined using Bond's method.

Key words: ore, Bond Crushing Work index (CWi), disintegration, press-roller, microcracks, crushing, milling, crack, stress, selectivity, failure.

- Khetagurov V.N., Kamenetsky E.S., Minasyan D.G., Sobolev S.E., Pliyev V.A.** THE GROUND MATERIAL MOVEMENT IN THE WORKING SPACE OF THE VERTICAL TYPE CENTRIFUGAL MILL USING THE RADIAL RIBS WITH CUTOUTS IN THE ROTOR **319**
- The results of vertical centrifugal mill testing are issued. Using three-dimensional computer simulation the motion of material to be ground in the working space of the vertical type centrifugal mill with the cutout in the radial ribs of the rotor is set. Theoretically and experimentally it was established that the radial ribs with the cutouts use allows to reduce the tangential velocity layers of the crushed material above the rotor, which should improve performance of the centrifugal mill on the original product, reduce overgrinding of the finished product and energy consumption for materials grinding.*
- Key words: vertical type centrifugal mill, the ground material movement, the design of the rotor edges, computing experiment, experimental studies.*
- Shigin A.O., Gilev A.V., Shigina A.A.** STRESSES AND STABILITY OF ROLLING CUTTER BITS IN COMPLEX-STRUCTURE ROCK MASSES **325**
- The authors have developed calculation procedures for axial loading of rolling cutter bearings, impact stresses due to rolling of the cutter on teeth and owing to alteration of rock properties, and for bit stability under existing loads governed by rock properties and drilling regimes.*
- Key words: fatigue strength, rolling contact bearings, rolling cutter bit stability, impact loading, physico-mechanical properties of rocks, impact load in rolling on cutter teeth.*
- Chistyakov V.K., Vishnevskiy N.A.** ANALYSIS OF THE MODERN STATE TECHNOLOGIES AND TECHNIQUES OF CORING FROM GAS HYDRATE SEDIMENTS **334**
- The development of method for improving gas hydrates coring requires summarizing and analyzing theoretical, experimental and practical data about technologies and techniques of coring from gas hydrates sediments.*
- Key words: gas hydrate, coring, core equipment.*
- Blasting operations**
- Bunin Zh.K., Nutfolloev G.S.** METHOD OF EXPLOSIVE DESTRUCTION OF THE ARRAY OF DIFFERENT STRENGTHS ROCKS **340**
- Consider the method of preparation of different strengths of rocks for excavation using the technique of cyclic and continuous action by the example of Jeroy-Sardara phosphorite deposits Kyzylkum region of Uzbekistan. One of the features of the structure of this field is the presence of soft layers of solid rock intercalations, requiring prior destruction. Method used at the field of explosive destruction of array of rocks due to the use of explosive energy deep-hole charges on hard seam. But this method does not fully ensure the destruction of the rock mass. The proposed method consists in the fact that over the strong seams cut slits in the thick overburden, have they shaped charges of explosives and blow, which provides qualitative different strengths crushing rocks.*
- Key words: hard seam, slotted charges, shaped charge, crushing, metal protection, tamping, energy of explosion.*
- Leshchinsky A.V., Shevkun E.B.** CRUSHED STONE WEDGING ABILITY IN COMBINED BLAST HOLE STEMMING **344**
- The laboratory experiment on wedging ability of different-size crushed stone in stemming a blast hole with a concrete cone has shown that regardless the con-*

crete cone height, the height of filling the space between the cone and blast hole wall with crushed stone depends on average size of crushed stone. Coarse crushed stone possesses the best wedging ability.

Key words: stemming, blast hole, fine crushed stone, drill cuttings.

Leshchinsky A.V., Shevkun E.B., Lukashevich N.K. ESTIMATING WEIGHT OF ELASTIC COMPONENTS OF GAS-PERMEABLE EXPLOSION SHELTERS **349**

Having analyzed operation of gas-permeable explosion shelter made of connected elastic components, the authors present calculation procedure for weight of the shelter based on explosion shock pulse.

Key words: production blast, gas-permeable shelter, fine soil, shock pulse.

Economy, management and planning

Arzykulova A.E. ESTIMATION OF COST AND PROFITABILITY OF JOINT EXTRACTION OF METHANE AND COAL ON THE DUBOVSKY SITE OF THE KARAGANDA POOL **356**

Complex development of methane and coal on coalbed methane fields of the Karaganda region is an innovation of production of methane commercially. Relevance and prospects of development of new fuel and energy complex in Kazakhstan are proved by estimation of cost of the investment project and a release of the project to payback.

Key words: complex production of methane and coal, profitability of the project, economic feasibility, new gas branch, project payback period.

Electrification and power supply

Bashkurov A.Yu. GANG BONDING OF DRILLING MACHINES TO DISTRIBUTION TRANSFORMING STATIONS IN CENTRALIZED POWER SUPPLY SYSTEMS **366**

The author has studied ways to optimization of power supply sub-system and, in the first place, coordination of distribution stations and voltage of distributors of process loads.

Key words: geological exploration power supply, centralized power supply systems.

Ecology

Kinsht A.V., Androhanov V.A. THE SYSTEM APPROACH AND THE OPTIMIZATION OF THE MINING LANDSCAPES **371**

The necessity and the opportunity to consider the optimization of the mining landscapes as a single process from the mining degraded to the mining reclaimed are shown. This process must keep within the period of real long-term economic planning (10–15 years).

Key words: socio-economic features of the landscape, the structure of the landscape, mining landscape, degraded mining landscape, reclaimed mining landscape, the optimization of the landscape, the optimization of the mining landscape, the optimization of anthropogenic landscape, the economic planning.

Valiev N.G., Slavikovskiy O.V., Slavikovskay Yu.O. GEOECOLOGICAL ASPECTS OF APPLIED GEOTECHNOLOGIES IN THE URAL URBANIZED TERRITORIES **378**

Intensive mineral deposits operation cause essential damage to the surrounding natural and geological environment. It is brought forward to use the index of applied geotechnologies subsurface capacity as the indicator of the extent of mining plants influence on geological environment. For the purpose of

minimization the consequences of mining complex enterprises technogenic influence the necessity to carry out works on ecological rehabilitation of technogenic free space springs up. For the purpose of selecting the direction of its conducting both in the course of fields development and during the period the deposit has been developed the article brings forward the classification of subsurface technogenic free space, forming as a result of deposit mining.

Key words: mineral deposits, mining complex, technogenic influence, technogenic free space classification, geotechnologies' subsurface capacity, economic damage, ecological rehabilitation of technogenic subsurface free space.

Oveshnikov Yu. M. Maximova I.S. IMPROVING ECO-ORIENTED TECHNOLOGIES ACOUSTIC LIGHTENING TECHNOLOGICALLY - CHANGE WATER PITS **383**

Features of improvement of acoustic treatment of waste water from the solid particles. The technology of acoustic treatment and the results of experimental research.

Key words: acoustic treatment, water recycling, chemical-free cleaning, waste water. The article describes the features of the acoustic improvement of sewage treatment of solids. Described the technology of acoustic treatment and the results of experimental studies.

Nikiforov V.V. ENGINEERING-GEOLOGICAL RESEARCHES NEGATIVE CONSEQUENCES OF ANTHROPOGENIC PROCESSES **390**

The complex of research methods earned additionally territories is considered. The results of drilling, these laboratory studies are analysed. The estimation of the negative anthropogenic processes is given. Obtain comprehensive integrated assessment of anthropogenic processes consequences.

Key words: Upper Kama potash deposit, engineering geology, seismic, drilling, physico-mechanical properties.

Mathematical modeling

Adigamov A.E., Romankov A.V. STOCHASTIC HILBERT PROBLEM FOR N-ANALYTIC FUNCTIONS IN A STATIC THEORY OF A HOMOGENEOUS ISOTROPIC ELASTIC BODY **397**

The stochastic Hilbert problem for polyanalytic functions of order n is considered. The problem is reduced to a system of stochastic Hilbert problems. Necessary and sufficient conditions for solvability are given.

Key words: polyanalytic function, characteristic operator, conformal mapping.

Kaplunov D.R., Yukov V.A. EVALUATION OF STABLE PERFORMANCE OF MINE TECHNICAL SYSTEMS UNDER UNCERTAINTY OF ORIGINAL MINING AND GEOLOGICAL DATA **400**

The conditions and limitations of mining systems sustainability were considered in five aspects: geographical, geological, technological, ecological, economic.

Key words: sustainability, mining system, indeterminacy, conditions and limitations.

Egor Nikolaevich Chemezov 75 **410**

Preprints

Golik V.I., Poluhin O.N. PROBLEMS OF UNDERGROUND DEVELOPMENT OF ORE FIELDS OF CMA **175**

Shows the role of the Belgorod region in the extraction of iron ores. Assessment of prospects of underground mining with the bookmark voids mixtures. Formulated the concept of recycling of tailings: unmarketable mineral raw materials with the use of effective technologies provides ecological-and-economic effect. Provides information on the technology of the preparation of stowing mixtures with the use of technological components. Recommended by the technology of extraction of metals from the tailings enrichment by mechanochemical activation of the apparatus. The formulated tasks of the development of mechanochemical technologies and indicated protected by the patents of the ways to solve the problem.	
Key words: diversification, mining, underground, mining, ore, technology, solid stowing a mixture of man-made components, the extraction of metals, tailings, by Mechanochemistry, activation, mining engineers.	
Bodnaruk M.N., Vayno A.E., Goncharenko S.N., Efimov V.I., Ismailov B.T., Kobayakov A.A., Kozlov O.V., Kulikova A.S., Le Binh Zyiong, Nilulin I.B., Petrova A.I., Petrov I.V., Popov S.M., Stoyanova I.A., Te A.A., Fedash A.V., Khelaia I.T., Popov M.S. ECOLOGICAL-ECONOMIC PROBLEMS OF THE MINING PRODUCTION AND DEVELOPMENT OF FUEL AND ENERGY COMPLEX	190
In the collection of papers includes articles of scientific employees, teachers and ASPI-migrants of the Moscow state mining University, devoted to organizational, mining-and-technical, economic and environmental problems of the development of the coal industry, coal mining regions and fuel-energy complex of Russia as a whole.	
Key words: municipal waste, the trends of waste generation, disposal methods, the problem of treatment of urban waste.	
Aybinder I.I., Zharikov I.F., Shenderov A.I. INNOVATIVE FEATURES COMBINED SYSTEM OF OPEN-PIT MINING.....	231
The prospects of further development of the combined system of the development, as one of the priority directions for development of progressive and open-pit mining. The new design and layout scheme of dlinostrelovyh, enabling the stower 1.5 times increase the height of the shoulder –1.7 nadugol'noj otrabatyvaemoj zone without the use of graphics-intensive technological schemes with by road or rail.	
Key words: system development, ledge, overburden, dragline, spreader, conveyors, crushers, road transport performance.	
Savenok O.V. METHODS OF THE FORECASTING FACTOR DIFFICULTIES OF OIL PRODUCING WITH COMPLICATED CONDITION AND ANALYSIS PRINCIPLE INFORMATION CONTROLLING SYSTEMS.....	295
At present at decision of the problem of increasing to efficiency of oil production with complicated condition to exploitation is worked out large number of the methods, technology and technical decisions with localized application then theoretical generalizing positions, complex approaches and optimization decisions are presented fragmentary. In article are considered methods of evolution modeling in system with sign uncertainty and incompletenesses to information	
Key words: Increasing to efficiency of oil production, complicated conditions to exploitation, methods evolution modeling, forecast methods, complex decisions, limiting radius to correlations.	
Yaroslavtsev A.G., Gikin A.A., Sanfirov I.A., Tumanov V.V., Sukhinin E.V. IMPROVED DIGITAL PROCESSING SEISMIC DATA FOR AREAS WITH HIGH NATURAL DEVELOPMENT PRESSURE.....	318
	429

The variants of the simplified and detailed analysis of seismic data obtained within the territory of the underworked, complicated faults. Analyzes the main problems associated with this type of processing seismic data, based on which offered the optimum parameters of observation systems and graph processing.

Key words: digital processing, shallow seismic, coherent noise, FK-filtering, velocity analysis, faults, thrust.

Deposited manuscripts

Zhigul'skaya A.I., Yakonovskaya T.B. COMPLEX MECHANIZATION PEAT EXTRACTION AND PROCESSING, TIMBER RESOURCES PEAT DEPOSITS	21
Morozov V.N., Tatarinov V.N., Kolesnikov I.Yu., Kagan A.I., Tatarinova T.A. PERFECTION OF METHODS OF DESIGNING OF URANIUM DEPOSITS WORKING.....	27
Seryj S.S., Godovnikov N.A., Agarkov I.B. INFORMATIONAL-ANALYTICAL AND SIMULATION SOFTWARE AND AUTOMATED CALCULATION OF THE STABILITY OF POTENTIAL PRISMS OF A COLLAPSE OF LEDGES OF OPEN PIT IN MASSIFS OF ROCKS.....	45
Zhigul'skaya A.I., Yakonovskaya T.B. THE ECONOMIC AND ENGINEERING ASPECTS OF NEW EQUIPMENT AND TECHNOLOGY OF COMPLEX EXTRACTION AND PROCESSING OF NON-WASTE RESOURCES PEAT DEPOSITS.....	50
Miroshnikova L.K. GEOLOGICAL-GEOCHEMICAL PECULIARITIES OF OLORSKIY'S INTRUSIVE.....	77
Lebedeva E.V. FORECASTING OF GEOLOGICAL INDICATORS.....	99

