

SUMMARIES

Artymiuk J., Aashama K.: **IP Based CCTV in Drilling** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The introduction of IP CCTV cameras has made it technically possible to have remote surveillance and control of drilling equipment. The live video transmission on Internet (or UMTS/GSM) enables integrated drilling operations from a drilling control room situated at the drilling company headquarter. Using Internet (or even UMTS/GSM) this integrated operation drilling control room can give support to a number of drilling operations at different locations. As an example, the presentation will give a brief description of an integrated operation drilling control room giving support to a number of drilling rigs in the North Sea. The presentation will focus on the IP CCTV part, but will also cover the real time data and control transfer of data from the drilling rig to the integrated operation control room.

Keywords: recording system with analog, drilling CCTV networks

Artymiuk J., Bednarz S.: **Analysis of Drilling Frame** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Bearing constructions applied for drilling boreholes with rigs are most commonly frame structures consisting of rigs or drilling masts. Their main bearing elements – shears – are deposited on foundation beams in the foundation plates in the ground or the subbase. In such a system the subbase is a basis for the rig and mast. The height of such a construction in the form of a cubicoid framework enables assembling devices protecting the drilling well's outlet. In operating conditions, the structure undergoes numerous loads, frequently exceeding those in the rig and mast. Hence much attention is paid to the construction of subbases as it is a guarantee of safe operation of the rig.

Keywords: drilling boreholes, drilling subbases, strength measurements

Artymiuk J., Bednarz S., Kiełbik W.: **Design Analysis of Welding Zones of Casing Pipes** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

During drilling operations in the well Odrowążek 1 in the north part of the Świętokrzyskie Mountains nine instances of string breaking took place. They were recurrent, similar in character and place of occurrence. The elements of the broken string were analyzed for their construction, non-invasive analyses, material tests and strength analysis. The results of the construction analysis are presented in the paper.

Keywords: drilling, mud pipes, zone of pipe welding, torn string

Bednarz S., Artymiuk J.: **Testing Casing Bridge** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Some operations accompanying drilling procedure require performing activities on the mast or rig, high above the floor. Work safety reasons dictated working out bridges with mobile platform over the floor. Depending on the length of the casing pipes, location of mud head and Kelly, the height of the platform can be regulated. The design of the bridge, results of applicability and load test results were discussed in the paper. The positive results enabled introducing a given bridge type to exploitation.

Keywords: drilling wells, bridge, work safety, functionality

Bednarz S., Artymiuk J.: **Mud Swivel Stem Exploitation Problems** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Connection of mud swivel to drill string creates the transition zone from rigid mud swivel to thin tubular string rotating at considerable tension load. The sub under swivel stem requires particular care during exploitation and maintenance. Geometry of swivel sub and its thread connection to stem exerts influence on stress concentration at dynamic loads. This leads to material fatigue and microcrack creation risk and connection thread break off or fracture. Material researches carried out allow better assessment of pin crack process during normal work and freeing stuck drill string operation.

Keywords: mud swivel, stem exploitation, thread, connection

Bęben D., Jewulski J., Janocha A.: **Evaluation of Salt Precipitation from Crude Oil on the Example of Selected Polish Mines** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The mechanisms of precipitation in polyphase characteristic arrangements the salt for were introduced brine in article. The principle of separation of brine was described during exploitation of crude oil. Special attention was paid to distributing highly mineralized brines from oil. The compositions of brines were analyzed on the example of selected Polish mines with regard to salt content. The chlorides content was qualified for crude oils after the first degree of separation, and the possibility of precipitation in mining devices the salt was verified. The ways of liquidation of emulsion and salt removal from the crude oil were indicated and the measures against precipitation of large saline agglomerations.

Keywords: oil, crude oil, salt

Bielewicz D., Wysocki S., Buczek-Kucharska Z., Wysocka M., Witek E.: **Laboratory Research of New Sulfonated Starch S1 for Drilling Mud Applications with Different Starch Comparison** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The paper presents laboratory research of new starch S1 usefulness to drilling muds in comparison with different starch applied in oil industry. Investigation of starch onto agreement with norms API were moved also. Results of investigations showed, that starch S1 characterizes bests technological proprieties and as only from studied norm API in full range fulfils.

Keywords: starch, drilling muds, API specifications

Bujok P., Mikundová P.: **A Concept of Research into the Temperature of a Rock Mass on the Campus of VŠB-Technical University of Ostrava** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Geothermal heat pumps are appropriate for retrofit or new homes, where both heating and cooling are desired. In addition to heating and cooling, geothermal heat pumps can provide domestic hot water. They can be used for virtually any home size regions in any region of the Czech Republic. The use of heat from the upper layers of the earth's crust can be a useful and efficient method of saving energy. At around 50 m below the earth's surface the ambient temperature fluctuates between around 8–12°C. This heat can be used by being transferred to the surface via a loop system using a high-efficiency refrigerant type material. These systems are also typically more efficient than gas or oil-fired heating systems. They are more energy efficient than air source heat pumps because they draw heat from, or release heat to, the earth, which has constant year's temperatures round, rather than to the air. Geothermal heat pumps use relatively constant temperature of the ground or water several meters below the earth's surface as source of heating and cooling.

Keywords: geothermal, heat pumps

Čorej P., Pinka J., Sidorová M.: **Geological Survey and Exploration of Baryta Deposit UMM Gerad** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

About 95% of the approximately 4–6 million t/y of baryta consumed worldwide is used as a weighting agent in the drilling fluid or “mud” for drilling deep wells by the rotary method. The balance is consumed in a variety of minor uses including functional, white, high-density filler in rubber goods, paper, etc., a source of chemical barium for glass and ceramics, a feedstock for various barium chemicals, and an ingredient in pharmaceuticals and food additives. Although barite is a fairly common, low priced mineral produced in more than 40 countries, there is extensive international trade designed to deliver large quantities to drilling regions such as the Middle East and North Sea. In many cases, baryta is shipped in a semi-crude form and ground to specification close to the point consumption, often by international drilling supply companies such as MI Drilling Fluids or Baroid.

Keywords: barite, project, survey, UMM Gerad

Dubiel S., Ziaja J.: **Decisions of Recognition and Liquidation of String Seizure** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The effects of string seizures encountered during drilling oil and geothermal wells were analyzed for establishing causes and type of the seizure. The technological decisions concerning string seizure were formulated in view of the method of solving the problem. The linear regression equation was determined with statistical analysis methods for predicting the time of freeing the seized string at a given depth of the well.

Keywords: drilling wells, drilling failure, liquidation of drilling string seizure

Duliński W., Ropa C.E.: **Analysis and Establishing Production Parameters of Mineral Water Wells, Depending on Gas Index** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Mineral waters produced by wells are diversified in their mineral composition, energy conditions, water yield and gas exponential. Bearing in mind the management of mineral water and the co-produced carbon dioxide, an example of exploitation from a medium gas exponential well was analyzed in the paper. Values of pressure drop of the fluid running in the near-wellbore area, as well as calculations of pressure drop in the string at varying production rates, are calculated in the paper. The optimum diameters of the string for maintaining self-production are defined.

Keywords: mineral water exploitation, optimization, near-wellbore zone

Dușe D.-M., Dușe C.S., Deac C.: **CELGAS – Conventional & e-Learning Gas Engineering Centre** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

CELGAS – an acronym for “Conventional & e-Learning Gas Engineering Centre” is a Leonardo da Vinci Vocational Training Action Programme unfolded by several education institutions and research centres from Poland, Germany, Romania and Slovakia, under the coordination of the University of Mining and Metallurgy of Cracow, between December 2005 and December 2007. The programme’s objectives are aligned to the cooperation between the European Union and Central and Eastern European universities and research companies, as well as to the vocational training area involved in the domain of natural gases. The primary objective of this programme is to create a network capable of providing education and training to engineers from the gas industry so as to encourage ongoing adaptation of skills to meet the needs of workers and companies, contribute to reducing unemployment and facilitate personal development.

Keywords: e-Learning, gas engineering, Leonardo da Vinci Programme

Fedyshyn V., Bahniuk M.: **Peculiarities of Atypical Hydrocarbon Systems of Ukrainian Fields** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

On the territory of Ukraine within Dniepro-Donets depression a number of oil and gas condensate pools with atypical for them properties has been revealed. These are hydrocarbon formation fluids of transitional state with initial gas content over 800–1000 m³/m³ in oils or content of fraction C₅⁺ in gas over 1000 cm³/m³. Under such conditions it becomes complicated to define pool type (phase state), since well-known numerical classifications with the use of different physical-chemical characteristics and their ratio turn out to be ineffective. In particular, the formation hydrocarbons of Sary field horizon V-18 simultaneously have the indications typical for oil and condensates. Phase state of such formation systems can be established only during special thermodynamic investigations in installations of phase equilibrium under condition that liquid-gas ratio in production of wells is properly measured. Even, insignificant deviations in the value of this ratio lead to phase equilibrium displacement in experiments and errors in determination of formation hydrocarbon fluid type.

Keywords: hydrocarbon field, gas condensate, thermodynamic investigations

Fedyshyn V., Nesterenko M.: **Substantiation of Fluid Saturation of Reservoir-Rocks on the Basis of Petrophysical Studies** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The method of quantitative estimation of porous medium structural parameters by distinctive areas of capillary pressure curves is proposed, according to which the part of hypercapillary, capillary and subcapillary pores is being determined. Their relations stipulate to a great extent the character of reservoir rocks saturation with residual water and hydrocarbon fluids. Differentiation of oil is carried out in reservoir rocks (Horizon V-22 of Buhruvate and horizons V-20-21, V-25-26 of Yuliyiv's'k fields of Dniepro-Donets depression), in Lower Cretaceous terrigenous and Upper Jurassic carbonate reservoirs of Lopushnia field (Precarpathian oil and gas bearing region) and in reservoir rocks of Middle Cambrian Age of Girkaliai field (Baltic oil bearing region) by parameters of its displacement taking into account hydrodynamic and capillary forces. That permitted to advance arguments for total and recoverable oil reserves of the above-mentioned fields.

Keywords: reservoir-rock, porosity, residual water saturation, wettability, oil saturation structure

Galas M., Wilk S.: **New Method of Bi-end Application of Balloons to Stop and Bleeding Systems** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Among the presently used hermetic ballooning methods applied for cutting off the gas flow in a pipeline for making repairs, the ballooning method is most popular. It lies in introducing balloons through special stub pipes welded to the gas pipeline, which is an undesired ingerention in the structure of the existing gas pipeline. New ballooning technology lies in introducing balloons to the gas pipeline through the existing exhalation columns. With this method the welding operation can be avoided as it is an undesired ingerention in the structure of the existing gas pipeline.

Keywords: gas pipeline, ballooning method, renovation, gas pipeline repairs

Gasiński J., Kaczmarek T.: **Groundwater Observation System in the Lignite Opencast Belchatów – Advancement of the System** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

A system of observation holes is an indispensable element of a dewatering system, which acts both as a tool of control and reconnaissance. The efficiency and the usefulness of the observation system are a sum of individual efficiencies of its elements. Therefore the greatest stress is laid on the assurance of the best possible technical state of the piezometer. Through the adequate selection of drilling diameter, the granulation of the cover, type of the

filter and the process of activating, we want to achieve the best efficiency of the plumbing-active part of the filter. The continually evolving system of the technical state control will allow us, in the near future, to thoroughly assess the usefulness of the separate monitoring holes for the entire system. This, ultimately, will lead to a raise of information value.

Keywords: dewatering, piezometer, activating, paramex

Gliński A., Koźbiał J., Janocha A., Bęben D.: **Evaluation of Efficiency of New Generation Corrosion Inhibitors by a Surface Corrosion Monitoring System on the Example of the Kościan-Brońsko Natural Gas Plant** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The aim of this work is to present the corrosion threats (which are caused by carbon dioxide present in natural gas) to a casing and surface installation in the Kościan-Brońsko Gas Plant. Furthermore, methods of reduction in corrosion are also discussed. The methods include the use of mining tubes, made of stainless steel, and corrosion inhibitors. The surface installation of corrosion inhibitor dosage has been discussed in order to monitor the above mentioned process as well as the effectiveness of introduced solutions.

Keywords: natural gas plant, CO₂ corrosion, corrosion monitoring, corrosion inhibitors

Gonet A., Stryczek S., Brudnik K.: **Technology of Closing Backfilling Wells in Salt Mines** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Backfilling wells are performed for a variety of situations. After being used, these wells should be closed as soon as possible, because their technical state usually deteriorates. This is especially important for salt mines, where they can be potential pathways for water. The closing technologies used for the reservoir and beyond it were discussed on the example of a backfilling well TP-24, drilled to the chamber Sanguszko in the Salt Mine "Wieliczka" S.A. Techniques of sealing up the near-wellbore area with the borehole injection method, and employing packers and properly selected sealing slurries are described in the paper.

Keywords: salt mining, backfilling wells, closing of wells

Grigoraş I.D.: **Natural Gas Resources and Reserves Estimation Study for the Commercial Field B** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The paper has the following targets: the fulfillment of the first natural gas resources and reserves estimation study for the commercial field B, initial geological resources and reserves evaluation and classification in order to be confirmed by N.A.M.R., existent gas resources optimum production scenarios, Discounted Cash Flow analysis.

Keywords: natural gas, resources, reserves, seismic, map, volumetric method

Habera Ł., Frodyma A.: **The Influence of Wellbore Perforation on the Skin-effect Value** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The perforation of wellbore casing is essential to allow the reservoir fluid inflow to the wellbore and further up to the surface. The perforation job employing high-energy material, results, however, in decreasing the permeability factor in the near-wellbore zone, which negatively influences productivity/injection ability of the wellbore. General set of factors determining permeability depletion within the near-wellbore zone has been called skin-effect. In this study the authors will give a closer look into the skin-effect creation mechanism as a constituent induced by perforating job, as well as its influence on further wellbore operation.

Keywords: perforation, skin-effect, productivity

Ivanov A.I.: Plugging-back Technology of Lost Drilling Flush Fluid in Circulation Zone in the Course of Drilling for Oil and Gas • Drilling Oil and Gas 2008 • Volume 25 • No. 2

There are catastrophic absorption flushing-out liquids while drilling oil and gas prospecting wells in complex geological conditions. It is necessary to make operative decisions on their liquidation. In this connection the development of new plugging structures and technological receptions for carrying out isolating works is an actual problem. It is offered to use new Russian swelling polymer "Petrosorb" for isolation works carrying out. "Petrosorb" creates compositions in rocks cracks.

These compositions have their isolating properties which depend on their ability to stay in cracks and interstices at the expense of:

- high polymer absorbing ability;
- the great volumetric expansion initial particles at the connection with water or water containing emulsion (swelling);
- viscoelastic properties of plugging-back system;
- chemical connections formations between functional groups of polymer and rock, so significant hydraulic resistance to current of a liquid through volume of the formed gel is created.

Keywords: plugging-back, technology, drilling, oil, gas

Jewulski J., Zagrajczuk D.: Application of Hydrophobization for Selective Water Curing in Wells • Drilling Oil and Gas 2008 • Volume 25 • No. 2

In this paper, the theoretical background of hydrophobization process in porous media was shown. The results of laboratory research of porous medium effective permeability dependence on its surface hydrophobization were presented. Analysis was done for different kind of porous medium (quartz sand and calcareous sand) using Sulfa-pal E-20. Influence of surfactant concentration and temperature was analyzed.

Keywords: exploitation, well, hydrophobization

Jüttner I., Vulin D., Lazo A.: Implementation of Improved Application for Determining Gas Z-Factor of Gas from the Molve Field • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Separator gas composition and separator liquid composition and corresponding standard data (pressure, temperature, liquid density, specific gravity etc.) were measured to obtain recombined fluid composition. The results of separator gas test and recombined wellstream were grouped and observed separately to verify published methods of compressibility correction factor, Z prediction. It was found that Dranchouk-Abu-Kassem method is in good correlation with laboratory data. Critical properties of separator gas and wellstream fluid mixtures, and also C7+ fractions were correlated using a number of published correlations. The properties were found to be similar to that found in literature, characterized by an accuracy decrease with decreasing molar weight accuracy of plus the fractions. However, individual pressure vs. Z-factor curves for each observed laboratory fluid analysis, calculated using the correlations, showed acceptable match with measured and then calculated pressure versus Z data. Modified correlation was made, similar to Sutton's and Standing's correlations for calculating pseudocritical temperature and pressure as function of specific gravity and compared to published correlations.

Keywords: Z-factor, equation of state, pseudocritical pressure and temperature

Kaliski M., Frączek P.: Selected Conditions of a Changing Role of Natural Gas in a Longterm Energy Policy of Poland • Drilling Oil and Gas 2008 • Volume 25 • No. 2

According to existing forecasts there will be a gradual change in the structure of energy sources in Poland. The forthcoming changes will result from international obligations aimed at reducing the level of emissions to the

atmosphere and adjusting the working of companies in the energy sector to standards imposed by EU directives. The need for restructurisation is also dictated by currently low competitiveness of the domestic energy sector and bringing it close to the world standards. As a result of such changes it will be possible to move away from energy based on coal and thus create conditions in which natural gas will play a more significant role in the domestic energy sector. The change is dependent on tools that must be created by government institutions, which will emphasise market mechanisms in shaping the structure of energy sources in Poland. It must be stressed, however, that until now the government actions in this area have restricted possibilities for change in the energy sector.

Keywords: natural gas, energy policy, forecast

Kaliski M., Jedynek Z.: Factors Shaping World's Oil Prices in 2007 • Drilling Oil and Gas 2008 • Volume 25 • No. 2

In early 2007 it was not predicted that prices of petroleum would achieve such a record level. An important problem on the market is the uneven distribution and high concentration of resources of petroleum in weakly developed countries. Highly industrialized countries always own limited stocks in relation to their proposed needs. At present, the divergence that exists between the desirable and actual condition in the supply of crude oil is an important factor determining the market. The realization of the threat of the occurrence of any disturbances has given way to speculations, whose effect is the observed uncontrolled and not always justified growth of prices. In this article an attempt has been taken to define the influence of the world environment on the level of crude oil prices in 2007. The essence of the work presented is expressed in the identification of chief sector and extrasector factors. The actions taken will make it possible to make a diagnosis of the conditions as well as rules functioning in oil markets. This article includes detailed information about the management of the petroleum economy. It presents the most significant social and economic events which can exert influence on the level and dynamics of crude oil prices. It also pinpoints the occurring environmental, economical and technological limitations in the oil sector. The article ends with a prediction of oil prices in years 2008–2009. The proposals of future courses of action within the management of the petroleum economy have also been included.

Keywords: oil prices; concentration of resources, economy

Kaliski M., Szurlej A.: Perspective Segments of the Polish Natural Gas Market • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The main conditionings of the Poland's natural gas market are presented in the paper. Attention was drawn to the role of natural gas in the Poland's primary energy balanced as compared to other EU countries. The structures of recent natural gas deliveries and plans for the future are discussed. The perspective segments of gas market in Poland are outlined.

Keywords: natural gas market, energy balance

Klempa M., Mazáč J.: Realization of Boreholes for Heat Pumps in the Area of the University Hall and the Centre of Innovational Technologies (CIT) VŠB-Technical University of Ostrava • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Down the hole hammers seem to be the best instruments for drilling the boreholes for heat pumps. Heat pumps use renewable energy sources to supply heat for homes or industrial buildings and to heat service water. Boreholes for heat pumps are unrecoverable products. Therefore they have to be drilled in high quality. Basic information about down the hole drilling is given in this paper. Attention is paid to disintegration of rocks using down the hole hammers, their construction, basic technical characteristics, drilling equipment and also ensuring the optimum conditions for effective operation of the down the hole hammers. In the end, the areas of their application with the concrete case of drilling in the area of Aula + CIT VŠB – Technical University of Ostrava are presented.

Keywords: borehole, heat pump, downhole drill hammer, casing pipe

Kolonskikh A.V.: Diagnostic of Well Technical Condition by Flow Rate Dynamics Analysis • Drilling Oil and Gas 2008 • Volume 25 • No. 2

There are several problem of Usinsk oil field development. One of problems is a small level of study of processes occurring in a reservoir. Other complication is connected with a problem of production well measuring with heavy oil. Well production indicator "Sputnic-Neftemer MK10" allows making measuring of production well with heavy oil. Moreover measuring of production well is made on three components (oil, water and gas) constantly in time. This measuring instrument allows investigating of producing oil well operation dynamics. The similar analysis of producing oil well operation has been made. There are two basic methods of oil well operation. It is submersible electro centrifugal pump and submersible electro screw pump. Dynamics of submersible electro centrifugal pump operation has spasmodic character and submersible electro screw pump operation has smooth character. Dynamics of oil well operation with submersible electro centrifugal pump and submersible electro screw pump is connected with relaxation properties of Usinsk heavy oil and unsteady composition of well production at pump suction. Modern mathematical devices were used for analysis (Wavelets analysis, Fourier analysis and other).

Keywords: multiphase meter, dynamic, heavy oil, artificial lift

Kopey B.W., Bednarz S., Stefanyshyn O.: Diagnostics and Life Prediction of Pumping Unit Reducers by Vibration Analysis • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The problem of determination of the technical state of pumping units reducing gears sharply is based on the estimation of their resource in the process of exploitation and after the repair in the conditions of repair base. It is especially needed to know descriptions of vibrations of reducing gears of pumping units by which it is possible to judge about the presence of defects, wear, damages or deformations of basic assemblies of reducing gears of different type. On the basis of classification of defects and connection them with vibroacoustic descriptions of reducing gears of pumping units the method of estimation of their technical state is developed and a remaining resource is forecast. During the long term work of machine the change of its state is fixed on the basis of collection and treatment of statistical information about the parameters of vibration. As a diagnostic parameter the dispersion of level of vibration is often used in practice. Acceptable the procedure of comparison of spectrum of vibrosignal, measured on the diagnosed equipment, with the spectrum of vibrosignal, measured before on equipment, or on equipment in good condition. On the basis of the vibroacoustic signal processing it is possible to define quality of repair. The use of functional-cost analysis of reducing gears of pumping units is conducted for cutting of costs on their repair.

Keywords: diagnostics, pumping units, gears, vibration

Kopey B.W., Łopatin W.W., Bednarz S., Kopey I.B.: Application of Discrete Sensors in Mobile Control-Measurement Systems for Rod Pump Units • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Basics of parameters, structure and application range determination of mobile control-measurement systems have been developed in cooperation of Ivano-Frankivsk National Technical University of Oil and Gas, Institute of Geotechnical Mechanics NAS and AGH University of Science and Technology for technical status evaluation of rod pump units. Discrete signal needs of different structural and functional system conceptions than analog signal. Justified and rational selection of discrete interface is possible on the basis of complex problems researches relative to control-measurement systems implementation in industrial conditions. Output signal is two variable functions of object location and supply current intensity for sensor. Sensor provides only logic transformation, therefore is completed with discrete interface of control-measurement systems fulfill memory function.

Keywords: discrete sensor, measurements, pumping unit

Kosowski P., Rychlicki S., Stopa J.: Transactions “spot” and “futures” at the Oil Market • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The history of world's oil prices is outlined and the main economic and political factors influencing oil prices are discussed in the paper. By the close of 1970s the oil prices were mainly determined by long term contracts drawn between oil producers and international petroleum concerns. Oil market started to change when the production of countries non-OPEC members for the first time exceeded OPEC countries production in 1982. By the end of 1982 nearly half of transactions on the oil market took place at the “spot” market. The oil prices at the “spot” markets were short-term based, the fluctuation of oil prices became a standard. To avoid such oscillations, the market participants started buying derivative instruments, i.e. “futures” contracts. The relations between sales at the “spot” market and the “futures” contracts in the period 1990 and 2008 were characterized.

Keywords: oil, price, oil market, “future”, “spot” contracts

Kosowski P., Rychlicki S., Stopa J.: Influence of an Underground Gas Storage on Its Economic Efficiency • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Issues related with economics of underground gas storing are presented in the paper. Changes in the gas market caused by liberalization policy promoted by the European Union require taking a new look on underground gas storing issues, especially economic efficiency. Inevitable formation of free and competitive market of storing services makes the operators learn the key elements of the storing installations influencing the achieved economic results. The influence of the degree of gas storage utilization on its economic efficiency and minimum price for natural gas storing services (providing the assumed return rate) is analyzed in the paper. The calculations were made for an exemplary gas storage, with the use of financial models worked out by the authors.

Keywords: underground gas storages, economic efficiency, oil market

Krilov Z., Kavedžija B., Bukovac T.: Advanced Well Stimulation Method Applying a Propellant-based Technology • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The world oil industry practice, during over the century of its history developed widely known conventional methods of well stimulation. Recently, an advanced well stimulation method, based on implementation of high energy (HE) materials (special explosives, propellants or rocket fuels), has shown to be competitive. The basic principles of propellant based well stimulation technology, employing propulsive thermo-chemical reaction for generation the multidirectional fractures inside reservoir rocks around the wellbore and laboratory investigation of original permeability modification on core samples due to propellant treatment are explained. Also, the well treatment procedure, using high energy gas fracturing tool, applied at two onshore oil wells in Croatia is described along with post stimulation well production results.

Keywords: well stimulation, productivity increase, hydraulic fracturing, gas propulsion, propellants

Kwaśniewski K., Sas J.: Compressed Natural Gas as a Car Fuel – an Alternative of Public Transport in Zakopane • Drilling Oil and Gas 2008 • Volume 25 • No. 2

One of the key challenges of contemporary world is reducing toxic emissions to the atmosphere. The level of emissions is defined by industry, heating industry, car and air transport. At a local scale, the structure of atmospheric emissions can vary in places where the industry has not developed. Zakopane is a typically tourist-oriented place, which, however is endangered with smog formation. This is mainly caused by the waste gases emission from heating plants and from the combustion of car fuels. The organization and financial solutions of a project dedicated to replacing of traditional fuel (ON, gasoline) with compressed natural gas for public transport in Zako-

pane, were proposed. They would enable reducing atmospheric emissions of CO₂, CO and other noxious substances, thus improving the quality of air in Zakopane.

Keywords: CNG (Compressed Natural Gas), LNG (Liquefied Natural Gas), CNG, HRV (Home Refueling Appliance), gas vehicles, waste gases emission level, Euro 4 and Euro 5 standards

Lazaruk Y., Hrab O., Kalnynya E., Matsuliak O.: New Type of Oil and Gas Traps Connected with Gravitational Dislocations of Sarmatian Deposits in Bil'che-Volyts'ka Zone of Precarpathian Deep of Ukraine • Drilling Oil and Gas 2008 • Volume 25 • No. 2

In many oil and gas bearing basins all over the world, such as Holf Cost, Burgos, Sun Jardge, Nigerian and others, arched without roots gravitational sliding faults were formed. They were formed in sandy-clay layers with very fast sedimentation process in the areas with significant gradients of deposit layers and formation slopes. Structural noses or narrow asymmetrical anticlines are formed as a result of deformation of formations during blocks sliding over the curvilinear fault surfaces. Gravitational faults are directed at the increase of deposit layers and stretch along areas of differential movements of tectonic substratum. According to the results of geological-geophysical investigations such dislocations are forecasted in Sarmatian deposits in the area of Horodots'k regional fracture. Probably, those gas-beds of Horodots'k field are connected with tectonically screened traps of gravitational dislocations. Carbohydrate traps of the same kind are forecast also along other regional fractures: Sudovo-Byshnians'kyi and Krakovets'kyi. They can extend to Poland.

Keywords: drilling, oil, natural gas, geological, geophysical

Lenhenkov N.S.: Gelling Composition Tests for Water-control Purposes • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Very often oil engineers meet with premature water encroachment of bed and wells on different development stages. Premature water encroachment of bed and wells leads to essential drop in current wells production and oil recovery ratio. These facts negatively influence the economic efficiency. Thus, creating an effective plugging agent for various geological-and-physical reservoir characteristics became relevant. The author proposes a gelling agent based on metallurgical production waste and hydrochloric acid as an effective plugging agent. The discussion of results of water-control core test for Tatarstan Republic (Russia) features and also tests that determine physicochemical features of gelling agent are presented. As the results have evidenced high feasibility of the gelling composition, it can be recommended for experimental-field tests.

Keywords: water control, gelling compositions, infrared spectroscopy

Lewkiewicz-Małysa A., Konopka E.: Evaluation of Groundwater Quality within the Industrial Organic Waste Repository • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The influence of long-term deposition of organic waste on the quality of migrating groundwaters and propagation of specific pollutions is analyzed in the paper. Owing to the possible exploitation failures in the landfill design, toxic substances (pesticides) may get to the ground and water environment. Potential hazards necessitate checking how the chemical composition of groundwater changes over years. It is treated as a safety criterion of failure-free deposition of dangerous substances.

Keywords: organic waste, pesticides, groundwaters, monitoring

Lewkiewicz-Małysa A., Macuda J.: Evaluation of Quality of Surface Waters Flowing to the Reservoir Solina • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The results of laboratory analyses of surface waters flowing to the Zbiornika Solina Reservoir are presented in the paper. The analyses were mainly based on biogenic compounds and organic substances determined with BZT₅ and

ChZT_{Mn} indices because of the agricultural activity in this area, and so the use of mineral fertilizers and discharge of communal sewage by a dozen of farm households directly to the surface water courses entering the reservoir. The quality of the surface water in the main water courses entering and leaving the Solina Reservoir was determined on the basis of the obtained results.

Keywords: *surface waters, quality water, polluted waters, biogenic compounds*

Lewkiewicz-Małysa A., Rogowska-Kwas R., Winid B.: **Reduction of Environmentally Hazardous Hydrocarbon Content** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The use of common hydrocarbon compounds in various branches of economy creates environmental hazard. Environmental pollution with oil products may be caused, e.g. by their uncontrolled leakage at the stage of production, transport and deposition. Oil and natural gas mining waste seepages also create an environmental problem. Physicochemical in-situ and ex-situ methods of reducing the oil products content in the ground and water environment are presented in the paper. The efficiency of the presented methods has been discussed.

Keywords: *sanation methods, hydrocarbons, environmental protection*

Lewkiewicz-Małysa A., Winid B.: **Dependence between Chemical Components of Weakly Mineralized Waters in Rymanów-Zdrój** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Low-mineralized waters of Rymanów Zdrój occur in I and II Ciężkowice sandstone horizon and in the Krosno Beds. These are waters of HCO₃-Ca and HCO₃-Ca-Mg type. Ion ratios were calculated on the basis of chemical analyses made over the last few years and the results were calculated. The proportions between ions illustrate processes shaping the chemistry of water and reactions following the flows.

Keywords: *low-mineralized waters, ground water geochemistry, chemical ratios, Rymanów Zdrój*

Lozyniak P., Misiura Ya.: **New Data about the Geologic Structure of Krosno Zone as a Result of Deep Drilling and Estimation of Its Gas and Oil Bearingness Perspectives** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Turka and Bitlyba subzones (subcovers) were marked in Krosno cover according to geological investigation, structure searching and deep drilling. The inside structure of both subzones is represented by the range of folds-flakes grouped in separate cobs. There are such cobs as Hrosovska, Limmenska and Ropavska in Turkivska subzones from north to south and Borynska, Yavorivska, Uzhotska, Bukovetska cobs in Bitlyanska subzone. Zones due to shallow and considerable dipping of Eocene Cretaceous formations are marked in cross intersection of Krosnenskyi cover. So it gives an opportunity to evaluate differently the gas and oil bearingness perspectives. In accordance with these data the largest intervals for oil and gas searching in Turkivska subzone are Limmenska and Ropavska cobs and in Bitlyanska subzone are Yavorivska and partly Bukovetska cobs.

Keywords: *geologic structure of Krosna zone, oil, natural gas*

Macuda J.: **Qualitative Analysis of Groundwaters in the Area of Waste Landfill “Za Białą”** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Landfills containing waste produced by the chemical and energy industry exert a very strong impact on all elements of natural environment. Their negative influence concentrates on ground and water environment, especially in the case of unsealed or badly sealed landfills. Toxic seepages infiltrating ground- and surface waters are for-

med. The results of laboratory analyses of groundwaters in the area of landfill "Za Białą" as well as the analyses of concentrations of selected parameters revealed quality trends of waters outflowing from the discussed area.

Keywords: environment, groundwater, quality of groundwater, landfill

Macuda J.: Evaluation of the State of Ground Environment in the Area of Oil Storing and Regeneration Systems • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Ground environmental contaminations with hydrocarbon oil-products are frequently encountered within the oil storing and regeneration systems. Such contaminations can be caused both by untight installations of industrial storages as well as systems for loading and unloading cisterns with treated oils. The results of analyses of aliphatic and aromatic hydrocarbons content in grounds of one of the existing Polish installations for treating waste oils are presented in the paper. The comparison of the results of chemical analyses and the environmental standards reveals that the ground is polluted with hydrocarbons and thus needs remediation.

Keywords: petrochemic installations, heavy metals, aliphatic and aromatic hydrocarbons, soil and ground pollution, soil and ground standards, remediation

Macuda J., Winid B.: Qualitative Evaluation of Groundwater Changes within the Saline Diapir "Dębina" • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Opencast extraction of lignite is preceded by dewatering of the field with a system of large diameter wells. Dehydration works result in a considerable increase of hydraulic drops following the direction of water flow towards the opencast. Owing to the presence of a saline diapir "Dębina" between the fields "Bełchatów" and "Szczerców", a barrier made of dewatering wells had to be made to protect the diapir structure. Its task is, e.g. limiting the water flow within the diapir, and consequently, reducing mineralization of pumped waters from washing out of the diapir structure. The quality changes of groundwater composition within the saline diapir in the conditions of enhanced groundwater flow have been analyzed in the paper.

Keywords: groundwater, lignite, saline diapir "Dębina", lignite opencast Bełchatów

Macuda J., Zawisza L.: Analysis of Acoustic Climate in the Area of Seismic Measurements • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The results of measurements of acoustic climate in the area of seismic measurements carried out with the vibration and detonation methods are presented in the paper. The measured values of noise emitted during measurements were a basis for assessing their environmental impact. The presented results should create bases for planning the course of seismic profiles in the area as well as evaluating their environmental impact.

Keywords: seismic measurements, noise, vibration method, detonation method

Macuda J., Zawisza L.: Evaluation of Ground Environment within the Technological Installations of Natural Gas Mine "Radlin" • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Inorganic or organic contamination of ground environment may take place within the area of natural gas treatment technological systems. Such contamination may be caused by leakages in the existing industrial systems, used for natural gas treatment, separation of reservoir fluids as well as drying and glycol regeneration systems. The results of analyses of the qualitative state of ground within the technological system of two Collective Centers Radlin I and Radlin II are presented in the paper. The samples for environmental analyses were collected in the immediate

vicinity of the main elements of natural gas treatment systems. The obtained results of chemical analyses of ground samples were compared with the quality standards for ground in industrial areas. An efficient method of protecting ground environment against contamination in the case of a failure of the industrial system.

Keywords: gas exploitation, soil, soil pollution, mineral oil, soil and ground standards

Maksyutin A.V.: Modernization of Borehole Elastic Influence Technology on Reservoir • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Comparative analysis of the basic technologies and methods of influence on reservoirs was led for stimulation of production and increases of oil formations recovery on a late development stage. The application of considered technologies was studied oil field with hard recoverable oil in strongly mudded terrigenous and carbonate reservoirs with low porosity and permeability. Efficiency and ecological safety of technologies was considered. The report considers the technology of borehole influence on productive layers by elastic impulses at resonance frequencies for stimulation of oil-and-gas wells and deposits for reservoir recovery increase. It also describes the physical principle, the method and equipment for stimulation oil-and-gas wells and deposits by this technology. The report also gives the result of successful use of the equipment "Pritok-1M" at deposits with various geological and technological conditions of different regions in Russia and China. Now researcher are conducted an opportunity of use this technology together with application of solvents, injection of compounds, thermal methods for carrying out of well treatments on oil fields with viscous oil and bitumens.

Keywords: elastic influence technology, viscous oil, enhanced oil recovery

Mazáč J., Janků M.: Drilling Works for Degassing Purposes in the Conditions of Green Gas DPB, a.s. • Drilling Oil and Gas 2008 • Volume 25 • No. 2

"Degassing" is one of the terms which was a part of the name of a specialized organization introduced in 1960 in the Ostrava-Karviná mining district for the purpose of ensuring the security of the coal mining works' realization in the Czech part of the Upper Silesian hard coal basin. The Degassing and Drainage Plant (the original name of today's Green Gas DPB, a.s.) has thus already been dealing with borehole degassing-related activities for 48 years.

Keywords: degasation, boreholes, casing, drill string, coalface

Miska S., Mengjiao Yu, Yi Zhang, Miska W.: Model of Drag and Torque for Casing Running in Extended Reach and Horizontal Wells • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Application of extended reach and horizontal wells for offshore and onshore exploration and production purposes has been continuously increasing over the last decade. To reach the desired targets many of these wells are planned to have there dimensional complex well trajectories. Field experience indicate that running casing into wells with high horizontal departure and complex trajectories is frequently associated with many problems resulting in high cost of operations. In some instances the high pushing force resulted in casing buckling and the casing has not reach the planned depth. To reduce the pushing force one can rotate casing but that requires application of a sufficiently high torque. In any case accurate calculations of drag forces and torque are needed to evaluate casing mechanical integrity and technical feasibility of the casing running operation during planning and drilling stage of well development. In this paper we show the development of an improved characterization of wellbore trajectory by including the wellbore torsion in addition to the traditional wellbore curvature (dogleg severity). We also show the development of 3D drag and torque model that makes allowance for wellbore curvature, torsion, pipe bending stiffness and its weight in fluid. Finally, the paper is furnished with practical examples that show the application of the developed mathematical model. The proposed model is useful for practical design applications such as optimization of a well trajectory, calculating loads on casing and better understanding of field records and observations.

Keywords: drilling, drag and torque, horizontal wells

Moroshan R., Zayats K.: **Geological-geophysical Deep Model along the Transcarpathian Seismic Geotraverse Dobromyl-Krakovets** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

According to reinterpretation results of seismic data together with gravimetry and electrometry in direction of Dobromyl-Krakovets geotraverse, a model of geological cross-section was built, which is studied from the position of oil and – gas bearing prospects.

Keywords: geology, geophysics, seismic, gravimetry and electrometry

Mukhametzhano S.T., Darkhan Akhmed-Zaki Zh.: **Modelling of a Problem of Phase Transitions at not Isothermal Filtration and Qualitative Properties of the Decision** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The resolvability of Stephen's problem with convective heat transfer met in problems of the theory of not isothermal filtration is considered in the paper. The speed of a liquid phase is considered to be known and congruent with the Darcy law. Everywhere where the temperature of fusion of paraffin is lower, it is considered to be equal to zero.

Keywords: mathematical model, well-boring areas, algorithm, water saturation

Muvrin B., Kavedžija B., Stryczek S.: **Prevention of Spreading out Hydrocarbon Pollutant in Ports** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

For many years, during charging of oil tankers or other motor vessels (yachts, motor boats and other vessels that use hydrocarbon fuels) arises the problem of spilling smaller or larger amounts of fuel into the sea, that spreads out quickly within and even beyond borders of port (marina), resulting in pollution of the sea even above allowed limits. The same problem arises during accidental situations. Removal of spilled fuel is, depending on the collecting method applied, extremely complex and expensive. It is important to emphasize the impossibility of total removal of spilled fuel. There are several solutions suggested for the booms problem, but none of the suggested completely met all the criteria for prevention of spreading of spilled oil. One of the main disadvantages of suggested solutions was the necessity of using the tugboat or other suitable vessels for surrounding the tanker or boat at the dock or place of accident with the boom, and its removal. The problem of setting the boom could be solved with installation of bounded self-rising boom. This self-rising boom is immersed to a certain depth, so it visually does not affect appearance of the port (marina). This kind of sea protection system in ports with self-rising boom eliminates the need for tugboats or other vessels usually used for setting the protection boom around the vessel during accidental situation. The application of this kind of protection system does not shorten recharge time, but allows maximum sea protection in ports (marinas).

Keywords: hydrocarbon pollution, port, marina, bounded self-rising booms

Oracz H., Kalinowski K., Dąbrowski A., Sobkiewicz D.: **New Method of Detecting of Leak in Diagnostic of Gas Pipeline System** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

This report describes new directions in gas transmission pipelines diagnostics as well as new methods and equipment used to detect leaks. It was also shown that efficient and functional diagnostics system is the necessary condition to keep the exploitation of transmission systems safe.

Keywords: gas pipeline, detecting leaks

Pinka J., Wittenberger G.: **Core Drilling Tools Used for Oil and Gas Prospecting in Slovakia** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Some methods and techniques, verified in day-by-day practice are commonly used for qualitative withdrawal of a core in Slovakia. The paper presents describing these methods, techniques and division of the splitting of a rock mass onto a sample form.

Keywords: drilling tools, oil, natural gas

Pinka J., Wittenberger G.: **Deep Well Coring of Oil and Natural Gas Wells** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Coring is a drilling-technical operation which allows integral sampling of the drilled rock – a so-called core. The core is the highest quality part of material documentation of the well. Based on technical equipment used for coring, and based on a chosen coring technology, we can get mechanically undamaged core (or in physically unaffected condition). Individual techniques and technologies allow core-sampling of various types of rocks.

Keywords: well, drilling, natural gas

Piteiu M.A., Şuţoiu F., Simescu B., Costin N.: **Changing Well Completion in a Mature Gas Well Using Velocity String** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

In a gas field production decreases over time and can eventually stop producing completely because of liquid loading. As the reservoir pressure in a gas well depletes, there may be insufficient velocity to transport all liquids from the wellbore. In time, these liquids accumulate and impair production. The factors that are causing this problem include declining reservoir pressure, gas velocities and increased water production. One method of restoring a well that is liquid loaded back to flow production is installing a smaller diameter tubing string to run inside the production tubing of a well. Regarding advanced rate of depletion in Romgaz gas fields, reinjection method gives viable solutions to face the problems that appear in the exploitation of the wells with appreciable liquid impurities production.

Keywords: well completions, natural gas, production, reservoir pressure

Pylyp Y., Danylenko V.: **Using in Oil and Gas Industry of Experimentally Determined Filtration Parameters of Cap-Rocks** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Experimental determination of cap-rocks filtration parameters initiated only in the end of 60-th of the past century is being carried out in separate laboratories all over the world and includes measurements of absolute gas permeability K_{per} and inrush pressure drop Δp_{in} in hydrocarbon fluids through water saturated rock samples. The values K_{per} for cap-rocks in various regions of Ukraine are within the limits from 10–3 to 10–11 μm^2 , and Δp_{in} – from 1–2 MPa to 20–40 MPa. These data are used for determination of hydrocarbons migration conditions, formation and conservation of their pools, solving the tasks of oil and gas prospecting, designing and exploiting of underground gas storages (UGS). Particularly, possible volumes of oil and gas migration were evaluated, which turned out to be considerable-through the area of conditional cap rock only 1 km², thickness 50 m and permeability 10–8 μm^2 at pressure drop 1MPa can be filtered near 80 billion m³ of gas or 8 million m³ of oil for the period of 1 million years. The possibility of increasing the pressure and gas storing volumes in separate UGS of Precarpathians by 20–30% as compared to the projected values has been experimentally proved.

Keywords: oil, natural gas, cap-rock filtration parameters

Pylypyshyn B., Khavenzon I.: **Methodology of the Hydrocarbon Pools Prognosing by the Complex of a Geophysical Data** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The proposed methodology is worked out for the aims of oil and gas geology and can be used at investigation of terrigenous, terrigenous-carbonate and carbonate sections. It can also be used at prospecting and exploration of coal, ore, diamond deposits and underground water, as well as at the solving the tasks that need the detailed knowledge of the section structure (gas storages, slide dangerous zones etc.). The methodology includes the new methods and techniques of processing and interpretation of geophysical data. It is realized as a programme-methodical complex (PMC) "Seismocyclit" and "AFCM" – amplitude-frequency characteristic of medium, computed according to the noise constituent of wave field. It is based on the theory of sedimentary cyclicity – lithology (the teaching about rock-formations associations) and on the assumption of discompaction and compaction zones existence (the zones of reservoirs and cap rocks development). The uniting of the known geophysical methods and techniques, which were tested by time with the worked out by us techniques of processing and interpretation have led to creation of the new instrument for geological investigations. The advantages of our methodology in comparison with the commonly used methods consist in the possibility of obtaining the new qualitative data as to geological structure of the studied areas, which permit to carry out the forecast of hydrocarbons pools.

Keywords: *hydrocarbon, reservoir, cyclit-section, deposit, seismolithmological, complex*

Rybicki C., Blicharski J.: **Mass Balance for Natural Gas Exploitation in Dynamic Conditions** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

In many cases of the reservoirs or underground gas storages production exist technical hindrances of closing of wells in time to permit the authoritative measurement of static pressures both at head and bottom of wells. A because important problem in reservoir engineering is the qualification of these pressures, necessary for the verification of resources of gas, from the values of dynamic pressures. Presented paper introduces just the method of marking of average pressures in the reservoir on the ground measured dynamic pressures in the well. This method is based on using of the terminal solution of gas inflow to the well in semi steady state. On the base of the dynamic pressures measurement in production wells one marked values of average pressures in the reservoir and then with the method " p/z " one executed estimations of energy conditions of analyzed reservoir of the gas and one marked initial resources of gas in zones of influencing of well. Obtained results were verified executing alternative balance calculations basing on measurement of bottom pressures in static conditions. From comparing results the full usefulness of the method.

Keywords: *deposit exploitation, oil, gas, mass balance*

Rzepka M., Styczek S.: **Laboratory Methods of Determining Technological Parameters of Fresh Sealing Slurries Prior to Sealing Casing in Boreholes** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The quality of the applied cement slurry plays an important role in the correct sealing of the well. The composition and parameters of sealing slurry mainly depend on geologic and hydrogeologic conditions of the well in which the binding processes and cement stone formation take place, depth, temperature and pressure downhole. Therefore, prior to the application for sealing casing pipes in a drilling well, the sealing slurry should be analyzed in laboratory conditions. The tests should cover all the technological parameters which could have a direct influence on the course and efficiency of cementing procedure in a drilling well.

Keywords: *drilling, sealing of casing, cement slurries*

Shakenov K.K., Kuttykozhaeva Sh.N., Issabekova N.A.: **Solution of Boundary Problem for Musket–Leverett Equations by Monte Carlo Methods** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The authors analyzed the Musket-Leverett model of biphasic filtration of incompressible liquids (ρ_i is constant) in the porous environment characterized by system of the equations relative to a saturation $s(x, t)$ and the “reduced” pressure $p(x, t)$.

Keywords: *model Musket–Leverett, Monte Carlo methods, “random walk by spheres”, “random walk by lattices”*

Sidorová M., Pinka J.: **New Technology and Engineering for Well Drilling with the Use of a Hydro-acoustic Device** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The main problem for oil-extractors, working in old deposits and with low formation pressure, and also where high-viscous oil is extracted, is irreversible pollution of a productive formation during its primary unsealing with drilling. To be the most responsible stage of well construction since the level of primary debit, the duration of effective well operation and factor of oil extraction during deposit development completely depends on cleanliness and quality of unsealing. In many foreign oil-extracting companies the specialized brigades are engaged in a productive formation unsealing.

Keywords: *primary unsealing with drilling, anisotropy, hydro-acoustic device*

Solecki T.: **Planning Dewatering of Construction Objects with Drilling Wells in Limited Access Conditions on the Example of Housing Construction** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Methods of planning dewatering of construction objects with drilling wells in the conditions of limited access are presented in the paper in view of geologic and hydrogeologic conditions encountered in the construction area. The analysis was made for an exemplary irregular-shape object with an underground basement level. The dewatering problem was solved with the use of a group of vertical drains. Owing to the shortage of available area, they were disposed within the trench. The dynamic water level was calculated in the specific vertical drains, as well as in arbitrary control points at the uttermost points of the construction object. The authors calculated the efficiency of the wells needed for generating a groundwater level decrease, at which construction works could be carried out. The vertical draining drilling wells were designed on the basis of hydrogeological measurement results.

Keywords: *hydrogeology, drainage, dewatering plan*

Sorokin I., Sorokin A.I., Goszowskij S.W., Martynenko I.I., Dudla N.A.: **Upgrading Gas Assay in Donbass** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

In work the actual problem of improvement the quality of gas approbation of coal deposits is proved and put. The design advanced gas collector is described, that allows increasing a considerably volume and reliability of selection gas tests. Results of its use on coal deposits of Donbass are resulted.

Keywords: *upgrading gas, coal deposits, quality of gas*

Ștefănescu D.-P., Tătaru A., Rotar D., Popa A.-M.: **The Maximization of the Ultimate Recovery Factor in Mature Gas Reservoirs Implementing Well Head and Field Compression** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Mature fields contribute more than 50% of the world’s gas production and therefore it is necessary to understand and to optimize the performance of these reservoirs. The obvious decline of the natural gas reserves associated

with relatively reduced volume of the new reserves discoveries, reclaim the implementation of a new technical-economical approach of the mature gas field. The final target is in fact, the extending the life of the reservoirs, in terms of increasing the ultimate recovery factor. One of the Romgaz concepts regarding this problem is to develop compression capacities close to the wells. Many gas wells can be subjected to increased production by reducing the well head pressure. By installing a compressor at the well head or in the field, the well head pressure can be reduced to increase the gas production and the ultimate recovery factor. These types of compressors are characterized by low to medium throughputs with low to medium compression ratios. The implementation of this method is imposed by production behavior of the semi-depleted Romgaz fields. The biggest advantages of this type of compression are represented by the installation low costs, a low maintenance, as well as a big flexibility at the working parameters' variation.

Keywords: exploitation, natural gas, production, well head pressure

Steliga T., Kapusta P., Jakubowicz P., Turkiewicz A.: **Modelling of Petroleum Hydrocarbons Biodegradation in Weathered Drilling Wastes from Waste Pits** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The aim of this article is to present the problem of drilling wastes purification on the example of a several waste pits, which are characterised by hydrocarbons contaminants different contents. While preparing the complex technology of soil purification (containing primary recultivation, basic bioremediation and inoculation with biologicals based on indigenous microorganisms and fungi), the laboratory tests done with the use of the "ex-situ" method are fundamental.

Keywords: petroleum hydrocarbons biodegradation, drilling, modelling

Stopa J., Wojnarowski P., Rychlicki S.: **Efficiency of Low Permeable Oil Field Completion with Horizontal Wells** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Presently horizontal wells are used worldwide both for new wells and for reconstructing the already existing ones. As compared to the vertical wells, horizontal wells offer a number of optimization possibilities as far as economic and technological parameters are concerned. The potential benefits and their utilization commonly fall into two categories. The first one creates possibilities of increasing reserves and/or enhanced production. The other one enables lowering the cost of the production process. Literature examples of application mainly refer to reservoirs having good reservoir parameters, and enabling obtaining very high yields. The results presented in this paper are comparative results of a number of computer simulations made for one of the low-permeability Polish fields. The results, presented in the form of yield forecasts in time, may be the basis of evaluation of profitability of such wells in small fields with weak reservoir parameters.

Keywords: field completion, horizontal wells, exploitation, efficiency of field completion

Stryczek S., Gonet A., Rzyczniak M., Czekaj L.: **Investigation of Properties of Mineral and Soil Mixtures in the Aspect of Their Utilization** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The results to research over usefulness the mineral and native soil mixtures with addition of drilling wastes and organic admixtures are presented. They are applied for:

- mineral tightening,
- the storage in place of wastes formation,
- the material to of terrains demoted reclamation.

Values of some physical and geotechnical parameters of tested mixtures have been calculated. Ranges of the measured parameters values with opinion of usefulness the created mixtures to chosen using are presented.

Keywords: drilling waste, utilization of wastes, mineral tightening, reclamation

Stryczek S., Gonet A., Wiśniowski R., Dvořák J.: Influence of Waste from Fluidal Combustion of Fuels on Technological Parameters of Sealing Slurries Based on Portland Cement • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The recipes of sealing slurries for were optimized on the basis of experimental results in view of such drilling applications as cementing of casing pipes, closing of wells, performing cement plugs, as well as for geoeengineering works related with sealing and reinforcing ground and rock mass. Laboratory analyses were performed on sealing slurries based on Portland cement CEM I 32.5 R having water-mixture properties 0.4; 0.5; 0.6 and 0.7; the fluidal ash content in the slurries was 5, 7 and 10%.

Keywords: drilling, geoeengineering, sealing slurries

Stryczek S., Gonet A., Zieliński J.: Modification of Technological Parameters of Sealing Slurries Based on Portland Ash Cements with Fluidal Ashes • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The results of analyses of influence of additive (fluidal ash) concentration on technological parameters of fresh and set sealing slurry based on Portland cement and ash are presented in the paper. A detailed analysis of the obtained laboratory results suggests that this type of slurry could be used for liquidating absorptive zones on the rock mass.

Keywords: drilling technologies, sealing slurries, geopolymers

Stryczek S., Wiśniowski R., Kumala B.: Influence of Superplastifiers on Technological Parameters of Sealing Slurries Based on Portland Ash Cements • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The paper is devoted to the selection of a hydraulic binder, followed by laboratory analyses, in the course of which the influence of the superplastifier Arpoment P on technological parameters of sealing slurries is measured, with special emphasis on rheological parameters. The obtained results enabled determining the influence of the plastifier on the type of the rheological model. With properly selected rheological model it is possible to accurately calculate the flow resistivity of sealing slurry in the process of cementing casing pipes.

Keywords: lling, sealing slurries, cements, plastifiers

Toth F., Veress L., Nicola A., Vlasin I.: The Latest Technologies in ROMGAZ – a Real Guarantee for a Future Development • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The need for implementing the latest technologies applied in the world oil and gas industry, has determined Romgaz to intensify the efforts in this direction, through a real acquisition campaign started with almost two years ago. Our papers will reveal not only the main equipments and devices recently acquired, but also the real advantages of using them in different situations, by exposing some case studies, which helped us to take the best decisions and to save the wells.

Keywords: ultrawire radial bond tool, production logging, casing inspection, multifinger imaging tool, magnetic thickness tool, echometer, downhole video camera

Twardowski K., Traple J.: Influence of Compaction on Reservoir-Filtration Properties of Miocene Rocks of the Carpathian Forefield • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The influence of compaction on reservoir-filtration properties of rocks was analyzed on the example of autochthonous Miocene sandy-clayey beds of the Carpathian forefield. The effective porosity and absolute permeability values for rock samples collected from the wells in the Przemyśl area were analyzed. The analyzed parameters were observed to change for a vast range of rock depth (to over 4000 m), and the results were compared with the mechanical compaction modeling results. The discrepancies can be explained by various clay content in the rocks and also chemical compaction processes, mainly their diagenetic cementation with carbonates.

Keywords: rock compaction, Miocene beds, Carpathian forefield, porosity, permeability

Uliasz M., Herman Z.: Preservation of Wellbore Zone Properties by Using Special Completion Fluids • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Before the workover or stimulation operations are started the well must be filled with so-called completion fluid which hydrostatic pressure overcomes reservoir pressure and protect against reservoir fluid flow into the well. The completion fluids are mixtures of artificial salt solution and filtrated reservoir waters. The authors discussed properties of completion fluids which were prepared in OGI laboratories.

Keywords: special drilling fluids, workover operations, protection of reservoir rocks

Wilk S., Galas M., Cwenaar R.: Work Safety at Posts Hazardred with Gas Outburst • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Legal aspects of work safety at posts hazardred with gas outburst are discussed in the paper. The conditions at which the outburst may take place and the prevention measures are presented.

Keywords: work safety, gas outburst hazard, legal regulations

Winid B.: Evaluation of Hydrochemical Composition of Selected Seepages in the Salt Mine Wieliczka on the Example of Hydrogeochemical Modelling • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Computer programs PHREEQE and PRQPITZ enable evaluation of the state of equilibrium of chemical composition of waters on the basis of physicochemical analysis. These programs describe processes taking place a multi-component (water-solid phase) system enabling calculation of the migration forms of water solution components (speciations) and saturation index of solution for various mineral phases. The states of equilibrium were determined for 42 water samples (mostly brines) in the Salt Mine Wieliczka with the use of both programs. The dependence of saturation indices for both minerals was plotted against the main ions content. The analyses reveal that waters flowing to the mine may dissolve rock salt, gypsum and anhydrite, whereas waters circulating around the reservoir generally should not be leaching the rocks as they have already reached the state of saturation or close to saturation as compared to evaporate minerals.

Keywords: hydrogeochemical modeling, mine waters, brine, Wieliczka Salt Mine

Wiśniowski R., Steperski P.: **Influence of Rheological Parameters of the Herschel–Bulkley Model on Cuttings Removal** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Despite the recent advancements in drilling, the problem of inefficient cleaning of the well's bottom and annular space from cuttings still remains valid. The resulting drilling failures and complications elongate the time of drilling and increase the cost of making drilling wells. One of the factors influencing the process of cuttings removal is the proper selection of physical properties and rheological parameters of drilling mud. The influence of the intensity of sedimentation of the solids in the liquid phase in dynamic conditions on the rheological properties of a drilling mud described with the Herschel–Bulkley model is analyzed in the paper. Basing on the experiments carried out at the Faculty of Drilling, Oil and Gas, the obtained results were analyzed in view of their applicability to the borehole conditions.

Keywords: drilling, drilling fluids, rheological models, cuttings removal

Wiśniowski R., Stryczek S., Ziaja J.: **Technology of Ballasting Casing Pipes Tripped in HDD Boreholes** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

One of the conditions of making a HDD well is the correctly performed casing process. In the case of steel pipes, a simulation of friction forces acting on the casing introduced to the well and the casing lying on the surface should precede. In the case of polyethylene casing, the friction in the upper part of the well can be avoided by multistage ballasting of the pipes. Mathematical bases of optimization of the polyethylene casing installation were worked out at the Department of Drilling and Geoengineering, Faculty of Drilling, Oil and Gas, AGH-UST. Ballasting enables lowering the pulling forces acting on the casing.

Keywords: pipelines installation, HDD technology, ballasting of casing pipes, friction coefficient

Zhapbasbayev U., Jiyembayeva K., Turegeldiyeva K.: **Maximizing of Condensate Recovery Ratio in Karachaganak Using Method of Cycling Process** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Karachaganak is located in the northwest region of Kazakhstan and it is one of the world's largest oil and gas condensate fields. Covering an area of over 280 km², it holds more than 1,200 million tones of oil and condensate and over 1.35 trillion cubic meters of gas. Karachaganak production originates deep underground in reservoir approximately 5,000 meters deep. The reservoir contains a vast quantity of oil, condensate, and gas all embedded in a porous rock structure. At these depths the earth's crust exerts high pressures and as a result the hydrocarbons are literally squeezed out of the rock formations and are under very high pressure. Upon entering one of the process plants the oil and gas is initially separated into a gas stream and an oil stream. This separation can be achieved through both a gravity method and through temperature reduction of the fluids. Individual wells productions can also be directed to a test separator. This regular testing is needed to measure the rates at which a well is producing oil and gas, to determine whether it is producing any water, and to measure the pressure at which it is producing. All of these measurements enable the engineers to optimize the production from the field.

Keywords: reservoir; oil, condensate, gas, cycling process

Ziaja J., Wiśniowski R.: **Analysis of Causes of Failure during Reconstruction Works with Coiled Tubing** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

The growing demand for energy minerals, especially oil, and the resulting growth of world's fuel prices induces on prospecting companies elaboration of new solutions. One of them is the necessity of intensifying raw minerals

in the existing wells. Unfortunately, owing to the bad technical condition of the well or drop of production, the wells need reconstruction works. The reconstruction works are high-risk operations (presence of pressurized medium, high wear of the surface and downhole equipment), therefore it is vital to know the newest reconstruction solutions or to ordering them at specialized companies. The forces acting during works with a coiled tubing are analyzed in the paper.

Keywords: coiled tubing, reconstruction works, enhancement

Jakubowicz P., Steliga T., Bąk W.: **Influence of Exemplary Contaminants on Deposit Water and Liquid Waste Injection to Absorptive Horizons** • Drilling Oil and Gas 2008 • Volume 25 • No. 2

Injection of brine and liquid wastes to absorptive horizons is one of the most effective methods of waste waters management. The aim of this article is to discuss the problem of waste water injection and the phenomena responsible for near-well area damage. Recognition of physicochemical processes, which accompany water pumping, is needed to the optimum usage of pumping wells. Determination of contamination influence on the processes of water injection is possible due to physicochemical analyses and simulations done with the use of AQUACHEM software. The modification of water treatment installation was prepared due to simulation data and industrial experience. Innovations and new technologies will reduce near-well area damage and an absorptive well will be able to work without break down. Volume of an absorptive horizon will be used more effectively in order to store waste water.

Keywords: brine, waste water, injection, absorptive horizon, AquaChem