Drachuk O., Melnyk Ye., Levandovych Yu., Yurova M. On commercialisation of development of the onshore prospective petroleum areas of Ukraine

There are considered the features of comprehensive taking into account geological and technical conditions in the development of prospective oil and gas areas of land that are located in densely populated areas and sanitary protection zones. This will help create conditions to increase the commercial attractiveness of the project of development through the use of technology cluster drilling and construction of multilateral wells on the example of Runivschyna area of Budyschy-Chutiv license block.

There are indicated the features of modern software design application for the construction of wells with different spatial trajectories trunks when the cluster drilling technology for multilateral wells is used. A geological modeling and design trajectories obliquely directed wells is made using modern software package Petrel Schlumberger Company. It is taken into account technical and geological conditions (opening the whole productive section). It is shown that the application of modern software packages for geological modeling and design of well features allows better consideration features drilling for oil and gas prospective areas on the land with limited or complicated allotment and the successful commercialization of projects for development of oil and gas prospective areas.

Key words: cluster drilling, multilateral well, land allocation, modelling.

GEOLOGY OF OIL AND GAS

Kryvulia S., Lyzanets A., Machuzhak M. Prospects of gas content and specifics of geological structure of deep-laying levels of Shebelynka gas condensate field
New data on geological structure and the natural gas content of deeply buried Middle Carboniferous and Upper Serpukhovian deposits in the Shebelynka gas condensate field is given.

The history of their exploration is reviewed. The main features of deep geological structure of deposit are covered, the features of gas reservoir beds and their parameters are considered. The further deep drilling proposals with the use of modern gas inflow stimulation technologies are presented. The new hydrocarbons discovery potential in gas reservoir beds at great depths are shown on the example of Shebelynka gas condensate field as productive formation to be explored first.

Key words: producing horizon, reservoir, well, deposit, field.

WELL DRILLING

Ohorodnikov P., Svitlytskyi V., Ivankiv O., Poliovyi A. Influence of intensity of transverse vibrations on dynamic state of drill string

The bottom area of the drill string operation in an unstable mode, depending on the frequency of disturbances and the length of compressed part, the magnitude of the axial load and displacement amplitude of the string edge was considered. It is shown that installation of vibro-protection devices above the drilling bit leads to reduction of the string edge displacement within the test frequency range.

Key words: intensity, transverse vibrations, dynamic state, the drill string.

OIL AND GAS TRANSMISSION AND STORAGE

Hrudz V., Al-Dandal R. Compared analysis of using antiturbulent additives of various types in oil products pipeline transport

There are given results of researches and a review of literary facts through the question of estimating the efficiency of applying anti-turbulent additives at transporting light oil products. There is given a comparative description of home polymeric substances with import analogues. A comparative analysis of
applying anti-turbulent additives of different types in pipelines transport of oil product.

The problem of unsteady flow of oil through the pipeline is examined during its replacement with anti-turbulent additives considering mode of pumping station at the beginning of linear area. A mathematical model of the motion process of contact between two liquid environments with different hydraulic characteristics of the pipeline is created. The implementation of this model allows to predict the nature of the motion of moving boundary and the distribution of oil pressure and flow rate for a non-stationary process of substitution. It was found that the method of the change of stationary states in the implementation of tasks leads to insignificant error which complies the precision of engineering calculations for predict modes. There is shown the influence of anti-turbulent additives on the work parameters of the oil pipeline.

**Key words**: antiturbulent additive, process of replacement, mode of operation of oil pump station.

Hryhorskyi S., Serediuk M. Determination of rate of filling the oil pipeline void space taking into account the specifics of hydrodynamic parameters of free-flow sections

The method of calculation of the void space filling rate for an oil pipeline in presence of gravity sections is given. The original software is developed to allow determination of the amount of oil that is in the pipeline and making of the material balance of the oil. The method proposed is tested on one of the operating areas of the Druzhba main oil pipeline.

**Key words**: transshipment point, gravity section, degree of filling of a pipe cross section, free-flow stream of liquid.

Storchak S., Zaiets V. Underground gas storages of Ukraine – reliable foundation for creation of an Eastern European gas hub
The articles deals with the matters related to prospects of establishment of a powerful Eastern European gas regulator (hub) based on the Ukrainian underground gas storages that can increase energy security of Ukraine, liberalize the domestic natural gas market, integrate into the European gas pipeline system and ensure the profitability of the country’s underground gas storages.

Key words: underground, storages, market, natural gas, legislation, integration, hub.

AUTOMATION AND INFORMATION TECHNOLOGY

Korobko I., Mohyriov Ya., Krotevich V. Information support to optimisation of turbine-class gas meters

The article presents the results of developing of software package for optimizing structural components of speed measuring transducers of gas and liquid flow rate. Such complex is aimed at solving the problem of creating of effective system of volume and volumetric flow rate measuring of fuel and energy resources. Correctness of the chosen construction principles of measuring flow rate transducers and basic technical solutions adopted by this is proposed to assess not through a large amount of costly experimental test works on layouts and laboratory samples but by implementation of optimization calculations through mathematical modeling using modern information technologies. The bundled software provides effective assessment of correctness of choice of parameter values of devices during their design and further researches. For this purpose a special software is developed that allows pursuance of optimization researches by using the obtained quality criteria of measuring tools.

Key words: flow rate, flow rate measuring, turbine measuring transducers, modelling.

UNCONVENTIONAL TECHNOLOGIES AND ENERGY EFFICIENCY

Karpenko V., Stasenko V. Dynamic thermal logging method
The theoretical basis of the method of thermal logging in a deep hole during drilling mud circulation after fixing its open bore with casing was reviewed. The Stefan–Boltzmann law is taken as foundation of mathematical calculations and physical presentations of the action of geothermal factor on the well space. The method uses experimental data.

Key words: method, thermal logging, deep wells, geothermal factor, the Stefan–Boltzmann law.

LABOR AND ENVIRONMENT PROTECTION

Shamanshkyi S., Boichenko S. Environment-friendly process of utilisation of wastewater sludge from aviation enterprises including biogas generation

There are several methods of airline enterprises’ sewage water sludge utilization. The most popular ones usually require sludge to be stabilized before being utilized. One of the possible methods of sludge stabilization is anaerobic digestion in installations called methanetanks. The method has significant advantages. It allows obtaining environmentally friendly organic fertilizers an energetically valuable biogas. One of the major deficiencies of the method, which restricted its wide application, is imperfections of modern digestion technologies. There shortcomings lead to pretty long durations of digestion processes and, as a result, to necessity of constructing methanetanks of large capacities and spending a lot of energy carriers on thermal stabilization of the sludge. All these can result in not having benefits that cover expenditure. In the paper there were studied latest research activities about processes taking place during digestion. It is shown that different stages of the process, such as hydrolysis, acidogeneses, acetogenesis and methanogenesis require different conditions in order to progress effectively. These conditions often come into conflicts. Therefore it is impossible to provide effective digestion, when the process is carried out in a single capacity. There are identified major favorable conditions for each stage in the paper and proposed a technology in which different stages of the
process are carried out in different capacities where favorable conditions are provide. It is shown that the technology can intensify the digestion significantly, shorten its duration, increase tradable biogas amount and make the whole process economically sound.

**Key words:** aviation enterprises, anaerobic digestion, biogas, methane tank, wastewater sludge.

**Saban V.**Environmental risks in shale gas production

*The article studies the environmental risks caused by man-made pollution due to a shale gas extraction. The research was done on ecological safety of Oleske field that is potentially bearing unconventional gas.*

**Key words:** shale gas, environmental safety, prospective resources, Oleske field, Yuzivske field, hydraulic fracturing.