SUMMARIES

Knez J., Knez D.: **Modelling of the system for cleaning up free oil products with the application of the MARS simulator** • AGH Drilling, Oil, Gas 2013 • Vol 30 • No. 2

Nowadays one of the most important problems in environmental protection is the pollution of groundwater by derivative products of oil. A common case of the infiltration of the oil derivative products to the ground water system is mainly connected with accidental oil spills in various types of environmental conditions. In this case we encounter numerous types of problems connected especially with the pollution in: 1) aeration zones, 2) saturation zones. The first step is a conceptual model for the proper recognition of the type and scale of the problem. After making a conceptual model it is possible to take a preliminary decision to recognize what sort of pollution is the source of the environmental problem. A study example describes modeling of free products of oil (LNAPL) floating on the groundwater table using MARS (Multiple Areal Remediation Simulator). The multiphase model was made on the basis of theoretical model concepts. In the modeling the recovery and migration of LNAPL are simulated, and the recoverable and residual spill volumes of derivate products of oil are estimated. Modeling indicates the best location of the remediation system and the pumping wells. Additionally, modelling can be applied to manage the remediation system for improving the efficiency and for decreasing the catchment area of piezometers and wells.

Keywords: *LNAPL, numerical modelling, remediation, oil product, extraction wells*

Dubiel S., Rzyczniak M., Godula A., Maruta M.: **Analysis of drill stem testing technology of the Malm carbonate rocks of the carpathian foothills, in the aspect of geological research and exploration decisions** • AGH Drilling, Oil, Gas 2013 • Vol 30 • No. 2

Gas-, oil- and water-bearing Upper Jurassic formations (Malm) in the area of the Carpathian Foothills are built from carbonate reservoir rocks with vuggy-fracture porosity system (or fracture-vuggy), which absolute porosity is from a few to several percent. At the end of the twentieth century DST tests provided a lot of reliable reservoir information, on which the important decisions for geological research and exploration, can be taken. The credibility of these tests results depends largely on the technology used.
The paper presents the results of three selected DST tests, differing in technology, particularly with attention to the usefulness of the obtained information in explorations for hydrocarbon deposits process.

Keywords: *explorations hydrocarbons reservoirs, DST tests of Malm sediments, technology and results of drill stem test DST*

Zamikhovskyi L., Ivanyuk N.: **Developing a new approach in diagnostic methods of technical state of propeller of gas pumping unit** • AGH Drilling, Oil, Gas 2013 • Vol 30 • No. 2

To estimate the influence of changes in aerodynamic and shape characteristics of propellers of the gas pumping unit on process variables of gas pumping unit using the mathematical modeling methods.
The method theoretically based Fredholm equation of the second kind for the tangential velocity component, its computational solution, and estimation of aerodynamical characteristics of airfoil of blades in special chosen frame of reference depending on the airfoil and attack angle. For the estimation of influence of shape configuration changes, which are determined by the configuration of blades of propeller on vibration characteristics of blades, cross-sectional area of blades and its second moment the numerical methods are used. Different methods of reproducing of shape configuration of airfoil of blades using experimental data of coordinates of relevant set points of airfoil are considered.
Theoretical results could be used in the research and estimation of influences of configuration blade change and quantity of strained blades on the productivity of pumping units. The conducted research and its results can be the

basis of creating of new non-destructive testing methods for gas pumping units and creating a new system of control. Shown results allow increasing operational reliability of facilities that were under research and systems, which can be helpful for Ukrainian gas and oil industry facilities.

Keywords: *blade, gas flow, integral equation, airfoil, aerodynamic characteristics, wear*

Poniedziałek M., Śliwa T.: **The use of a heater and borehole heat exchangers for the regeneration of heat resources in the rock mass on the example of the Geoenergetics Laboratory, AGH UST** • AGH Drilling, Oil, Gas 2013 • Vol 30 • No. 2

The regeneration of rock mass heat resources with the use of four sources can be done with the use of installations owned by the Geoenergetics Laboratory, Faculty of Drilling, Oil and Gas AGH UST. This paper is devoted to one of them, i.e. an air heater. In the case of increased thermal energy consumption the rock mass can be excessively cooled, which may cause problems with providing thermal standard for buildings making use of ground as a source of heat. New additional sources supplementing the process of heat resources regeneration is a key element of maintaining the high efficiency of the heating-cooling system. A real case exemplifying how free thermal energy can be stored with an air heater in the summer season is discussed in this paper. The procedure and respective conclusions are analyzed. The results of most important measurements are tabularized and their functions plotted in the form graphs.

Keywords: *borehole heat exchangers, geoenergetics, energy resources*
