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Petroleum Geology: Science and Practice in the 21st Century. New Ideas and Paradigms

Nikolay P. Zapivalov

Institute of Petroleum Geology and Geophysics-SB RAS, Russia

At present, efforts should be focused on studying and controlling the oilfield “life”, based on conceptually new ideas and methods in petroleum geology. In this report, new trends and approaches in the development of petroleum geology are outlined. The author substantiates the use of rehabilitation cycles in the process of developing an oilfield, in order to restore the energy potential of the stratum and filtration properties of the rock. In the long run, it will result in an increased longevity of the object and higher final oil recovery. Based on a wide range of data involving the author’s personal field experience, an empirical estimation is given of the value of critical perturbation for state equilibrium of a fluid-saturated system in the process of developing an oilfield, equal to formation depression of 5-8 MPa. A method for simulating oilfield dynamics is suggested and the type of evolutionary equation is proposed. The key task now is the efficient well-targeted development of the active oilfields, in order to produce the residual (hard-to-extract) oil in a soft, sparing and non-damaging way (**Improved Oil Recovery**), and discovering new hydrocarbon accumulations, including secondary ones and newly generated ones, throughout the whole stratigraphic section, with all depth horizons and various rock-fluid associations, in regions where a well-developed diversified infrastructure is already available. Also, the urgent demand for constant real-time monitoring of the actual current changes inside the fluid-saturated stratum makes it extremely desirable to create research-and-development polygons in various petroleum regions.

Biography:

Nikolay Zapivalov 68 years in petroleum geology including: 5 years (1950-1955) of education Mining Institute (Yekaterinburg, Russia), Petroleum Faculty, qualification «Geology and exploration for oil and gas fields». Each summer worked at oil exploration enterprises in Turkmenia, Bashkiria, and the Ukraine. 31 years (1955-1985) of field experience West Siberia, Russia: Geologist, President of West-Siberian Oil Exploration Enterprises. Discoverer of oilfields. 1964-1968 worked in India. 1962 – Ph.D. 1985 – D.Sc. 32 years (1986-2018) in fundamental science and teaching: Chief Scientist (Institute of Petroleum Geology SB RAS), Professor of Novosibirsk State University, Consultant of the University Petroleum & Energy Studies (India, Dehra-Dun).