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Public Lecture



Prof. SHEIK S. RAHMAN

Professor in Petroleum Engineering

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Sydney, Australia

“Smart Water Flooding of Porous Fractured Carbonate Reservoirs for Improved Oil Recovery”

1:00-2:00 PM, Tuesday, November 8, 2016

Building G, Ground Floor, G103 Conference Room

Abstract

Several techniques have been proposed to enhance or improve oil recovery after primary and secondary (water injection) recoveries. Enhanced oil recovery methods (EOR) using CO₂ or chemical flooding is very expensive and not readily available. Low salinity water flooding (LSWF) on the other hand is a relatively new method for improved oil recovery which is proven to be highly effective at lower cost especially in carbonate reservoirs. Experimental work on carbonate core samples has shown an initial recovery of up to 60% of the original oil in place (OOIP) using the traditional seawater injection with 200,000 ppm salinity. We apply pore scale analytical model upscaled to core scale by appropriate numerical method, such as the FEM in pro-elastic frame work after Abdelazim and Rahman (2015) for porous fractured carbonate rocks and validate core scale model by core flood experiment. The developed core scale numerical technique is then be up-scaled to reservoir scale using UNSW's multiphase thermo-elastic hybrid reservoir simulator for porous fractured reservoir (Abdelazim and Rahman, 2015 and Fahad and Rahman et al. 2016). Such a fully coupled and integrated numerical technique can investigate the reservoir behaviour due to different low salinity water flooding scenarios, optimum salinity for water can be determined for potential recovery of oil.

About the Speaker

Professor Sheik Rahman Received his PhD in 1984 from Technical University of Clausthal, Germany and gained extensive industrial experience and knowledge by working in petroleum industry (for 12 years), and teaching (for 4 years at KFUPM, Saudi Arabia and 27 years at UNSW). During the tenure of his career he has made major contributions to hydro-thermo-mechanical and chemical analysis of borehole stability, hydraulic stimulation of conventional and unconventional reservoirs, multiphase flow simulation in fractured and geothermal reservoirs and flow simulation in coal seam and shale gas reservoirs. He has established Australia's first drilling and well control program, “National Drilling and Well Control Program”, a joint venture between International Association of Drilling Contractors (IADC), Australasian Chapter and the University of New South Wales (UNSW). He has delivered over 100 industrial seminars on different aspects of well construction and down-hole completion technologies. He is a co-author of a book, titled “Casing Design – Theory and Practice” (Elsevier, 1995). He has served on the editorial boards of the Society of Petroleum Engineers (SPE), organised several “Advanced Technology Workshops” (SPE) and written over 250 scientific papers in conference proceedings and journals.