Impact of in-seam drilling performance on coal seam gas production and remaining gas distribution

Brisbane Seminar

Date: Thursday, 29 August 2019
Time: 16:00 to 17:30 pm

Registration: Please register online at https://www.fesaus.org/.
Numbers are limited, book early to avoid disappointment!

Place: Surat Room, Level 30
180 Ann Street
Brisbane 4000 QLD

Cost: **FESQ and student members free**

Presented by: Dr Fengde Zhou

Abstract:

Drilling horizontal wells in low permeability coal seams is a key technology to increase the drainage area of a well, hence decrease costs. It's unavoidable that some parts of the horizontal section will be drilled outside of the targeted coal seam due to the unforeseen subsurface conditions, e.g. sub-seismic faulting or seam rolls and current geo-steering tools, techniques along with drilling practices and experiences. . Therefore, understanding the impact of horizontal in-seam drilling performance on coal seam gas (CSG) production and remaining gas distribution is an important consideration in drilling and field development plans.

This study presents a new workflow to investigate the impact of horizontal in-seam performance on CSG production and gas distribution for coal seams with different porosity, permeability, permeability anisotropy, initial gas content, initial gas saturation, and the ratio of in-coal length to in-seam length (RIIL). Firstly, a box model with an area of 2km by 0.3km by 6m was used for conceptual simulations. Reduction indexes of the cumulative gas production at the end of 10 years of simulations were compared. Then a current chevron well which design consist of a vertical well and two lateral wells was selected as a case study in which the impact of outside coal drilling on history matching and remaining gas distribution were analysed.

Results show that the RIIL plays an increasing role for cases with decreasing permeability or initial gas saturation while it plays a very similar role for cases with varied porosity, permeability anisotropy, and gas content. The size and location of outside coal drilling will affect the CSG production and the remaining gas distribution.

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About the presenter:

Fengde Zhou is a senior geologist at the Arrow Energy Pty Ltd. Before joining Arrow, he was a research fellow at the University of Queensland and University of New South Wales and an associate professor at the China University of Geosciences. Fengde received his Ph.D. in Petroleum Engineering. He is a professional member of the Society of Petroleum Engineering and an editorial board member of the Journal of Petroleum Science and Engineering. He was awarded as a Top Reviewer by the Journal of Petroleum Science and Engineering in 2012. He is interested in reservoir characterisation for conventional and unconventional oil and gas reservoirs.