

Stress Map of Abu Dhabi, UAE

Dr. Abdelwahab Noufal

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Dr. Abdelwahab Noufal, Principal Engineer, Itasca Consulting Group, will speak on Thursday, May 27, 2021.

The topic is “Stress Map of Abu Dhabi, UAE.”

Abstract

Stress-sensitivity behavior of Abu Dhabi reservoirs is important for exploration, field development, production, and drilling, as the hydrocarbon production is driven by stress. Stress drivers influence the permeability and flow, therefore placing the horizontal wells in the optimum and in hydraulic fracturing design.

ADNOC created AI-&ML based applications, which facilitate using huge data sets to update the stress map for each reservoir. The results show the predicted permeability under variable stress conditions. As rock permeability dramatically reduces due to the closure of fractures, where the permeability decreases gradually with the increase in effective stress.

The goal was to combine the available stress-direction and magnitude data into a map that covers all Abu Dhabi and per each reservoir and to predict the deeper and the unexplored areas between the oil fields in addition to:

- In-situ stress state for design and construct engineering projects that involve drilling, development, production, and exploration.
- Optimizing oil and gas production in Abu Dhabi reservoirs (fractured formations)
- Effective stress is the controlling factor influencing permeability in tight reservoirs.
- Predict the constraints of permeability enhancement through a qualitative geomechanical model.

- Mitigation of drilling problems, field development plans, placing the horizontal wells and in hydraulic fracturing treatment design.

Biography

Abdelwahab Noufal is a Structural Geology and Geomechanics Expert at ADNOC, with about 30 years of diverse global experience in exploration, appraisal, field development and reservoir studies with operators and service companies in the Middle East, Europe, Asia and S.E Asia. His Masters (1991) was about structural and engineering geology and his PhD from Tuebingen University, Germany (1997) was about stress and strain analysis. He is acting as a focal point of knowledge and expertise within the ADNOC Group for Structural Geology and Geomechanics.