

Understanding Mischievous Amplitude Anomalies of Cretaceous Sandstone Reservoirs in the Middle Indus Basin

Adil Azeem¹, Waqas Ahmed¹, and Muhammad Aamir Rasheed¹

¹ OMV (Pakistan) Exploration GmbH

Abstract

Forward seismic modeling is a computational process which assists in the exploration and development phase of a concession to get a better understanding of the reservoir in question. This technique aids the interpreter to make sensible decisions during quantitative and qualitative analysis of seismic amplitudes in association with reservoir properties and fluids. Prime aim of this article is to provide necessary hindsight to the interpreter, to avoid amplitude interpretation pitfalls. The prolific, Cretaceous Lower Goru reservoir sands producing from different fields within the Middle Indus Basin are sometimes also associated with significant amplitude anomaly trends. An attempt has been made in the form of a case study to reveal the hidden message from one of such amplitude trends associated with the late Aptian reservoir sands of Lower Goru Formation within OMV Operated Middle Indus area. To ascertain the controlling factors of seismic amplitudes, different techniques are employed which include, wedge modeling, fluid substitution modeling, tuning cube generation and 2D acoustic impedance modeling. The integrated approach suggests that there indeed is contribution of seismic amplitudes coming from reservoir sands once they are above “detection limit”, reservoir properties being the major contributor. It also suggests that strong geological understanding of the reservoir sands plays a key role in qualitative interpretation of such amplitude anomalies.