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Defining Emerging Plays and Stratigraphic Architecture through Seismic Inversion and Well Data Integration in Jurassic Reservoirs of Kuwait

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SUMMARY

Intensive exploration efforts during the past three decades have resulted in discovery of many Jurassic oil structures in Kuwait. Once discarded as non-commercial, oil and associated gas accumulations in the Jurassic carbonate reservoirs are found to be significant and sustainable. During the journey of success we have learnt a few lessons and we are likely to learn many more in future.
Among the Jurassic plays the Marrat Formation is considerably thick and the reservoirs are highly heterogeneous, both vertically and laterally. On the other hand, the Mid to Late Jurassic Sargelu and Najmah Limestone are fairly homogeneous, but with very low porosity. Fractures are vital for the deliverability from these tight reservoirs. The overlying Gotnia and Hith evaporate cycles have yet another challenge, namely, stringers of carbonate reservoirs sandwiched between thin anhydrite layers.
In order to address the above concerns we have been regularly using seismic inversion as a part of our G & G interpretation workflow. Based on the problem definition, rock physics modelling and quality of seismic data, we have adopted different inversion workflows, both in post stack and prestack seismic data. The experience is effectively used in the identification of new plays and prospects in the least explored areas and formations. Some of the case histories shall be presented and discussed to illustrate the use of seismic inversion techniques in the context of Jurassic exploration in Kuwait.