continuity constraints or other spatial conveyance of information. Thus, the lateral continuity of the results is an indication of the stability and robustness of the algorithm.

Results

Sparse Layer Inversion (SLI) was performed on the 3D PSTM seismic data set over the Mangala field. The 7 to 50 Hz bandwidth of the input seismic data effectively increased to 7 to 100Hz by the inversion process. Improved resolution of the inverted data enabled a more detailed understanding of the lateral continuity and thickness of the two thin FM5 reservoir units. The improved imaging made delineation of the thin upper FM5 sand unit, while avoiding the fractured lower unit during drilling, possible.

Conclusion

Sparse Layer Inversion technology was applied to improve the imaging of thin reservoir units in the Mangala Field that are not resolved in conventional seismic data. High resolution inverted data enabled de-risking of horizontal well placement in these units. An integrated multi-disciplinary workflow was implemented for planning the wells, which called for state-of-the-art geo-steering tools for optimal well placement. In the end, proactive geo-steering with an advanced bed boundary detection tool, when combined with the highly detailed reservoir image through Sparse Layer Inversion, resulted in all well objectives being achieved.

Reference

Zhang, R. and Castagna, J.P. [2011] Seismic sparse-layer reflectivity inversion using basis pursuit decomposition. *Geophysics*, **76**(6), R147-R158.

Puryear, C. I., Portniaguine, O. N., Cobos, C. M., and Castagna, J. P., 2012, Constrained least squares spectral analysis: Application to seismic data: Geophysics, 77, V143-V167

S. Somasundaram, S. Chacko, R. V., R. Van Eykenhof, 2015, Increasing the effective bandwidth of seismic data through sparse-layer inversion: A case study from Mangala field, Rajasthan, India: The Leading Edge, 34, no. 1, 56-62, http://dx.doi.org/10.1190/tle34010054.1.

Acknowledgements

The authors would like to thank Lumina Geophysical for processing the high resolution data used for this investigation and Cairn Geophysical Function team for the constant technical support provided through the entire work.