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3D seismic in the mature onshore Dukhan field: What is the value of new seismic data?

Andrew Brodie Thomson, Qatar Petroleum

Peter Van Baaren

Hussain Al-Ansi, Qatar Petroleum

Andrew Smart, WesternGeco

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3D seismic data is recognized as a key tool in successful reservoir management. The existing Dukhan 3D seismic data is more than 15 years old and is of poor quality. 3D seismic technology has advanced significantly in the last 15 years and the technical case for new data appears to be strong. However, in a mature field with more than 700 wells, the potential business impact of new 3D seismic data needs to be carefully evaluated. QP undertook a seismic feasibility study in 2003 and concluded that the technical and business impact of new data needed to be tested before any larger scale full-field re-shoot could be considered.

To address this issue, a state-of-the art combined borehole and 50 square km surface seismic pilot 3D survey was acquired over Dukhan field in 2006. The purpose of the pilot survey was to assess the technical benefit of new acquisition and to assess survey design issues. Additionally the pilot 3D seismic survey allowed QP to get a much better assessment of the many logistical issues involved with shooting land 3D within an active producing oil field.

This Dukhan pilot 3D seismic survey successfully highlights the dramatic impact of the many advances in seismic technology over the last 15 years. The paper discusses the technical needs to be addressed by new seismic data, the acquisition and processing results, compare the new data with the old data and discuss the impact of the pilot data on plans for larger full field re-acquisition.