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3D OBC Seismic Survey Design for Multiple Objectives

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Abstract

ADMA-OPCO and ZADCO are performing an intensive 3D OBC (Ocean Bottom Cable) seismic survey offshore Abu Dhabi with the twin primary objectives of defining the Thamama reservoir in an undeveloped structure and defining the overlapping Mishrif reservoir in a currently producing field. Survey value is increased by the reservoir characterization information that can be extracted from the seismic data. The structural Thamama target has different seismic acquisition geometry requirements to those of the stratigraphic Mishrif reservoir. OBC acquisition has a huge range of potential geometries and value and costs. This paper describes the processes that were used to reconcile the technical and economic conflicts.

Experience from a previous 3D OBC survey highlighted the generic problems in the area:

- Source-generated noise
- Strong multiple interference
- Acquisition footprint

New survey design had to overcome these plus deliver high-resolution data (80 Hz at target level) to attain the stratigraphic and reservoir characterization objectives within a finite budget.

Team identification of key objectives was critical for the implementation of the successful survey design. Analysis and review of various modeling processes (acquisition geometry, seismic processing responses, acquisition economics) guided the team to an affordable solution that meets the geophysical objectives of a high-quality, high-resolution survey.

The process has provided a methodology that will be used as a basis for evaluating of cost versus quality in future surveys.