

## Multi Azimuth Survey Design for a Complex Carbonate Reservoir in Offshore Spain

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### Abstract

A feasibility study for seismic survey design on a complex carbonate reservoir in the Casablanca (Mediterranean Offshore Spain) was performed to evaluate the added value of a WAZ seismic. Geophysical studies were carried out by analysing different state-of-the-art WAZ techno/economical options. Illumination maps were generated to determine differences on the following configurations

NAZ configuration with navigation lines in the dip and strike directions of the structural trend

MAZ - dual azimuth configuration resulting from shooting the two above geometries

Wide Azimuth Configuration cable vessel and dual source vessels

Maximum travel time differences between anisotropic and isotropic model per Offset range were also inspected. Moreover, as BSIT provides HPC processing for wave propagation-based modeling, more precise simulations were carried out for anisotropic cases that provide even a better approximation in the scenarios stated for evaluation.

A 3D seismic acquisition is to be carried out with the following main objectives: to output a satisfactory image of the top reservoir horizon, to establish a confident velocity field model, to make possible amplitude analysis for determining complex reservoir properties, to obtain a better knowledge for the structural interpretation in the area, and to improve fault imaging.

Our modeling results indicate that MAZ geometry with only two azimuths (TWaz) will be sensitive to travel time differences associated to anisotropy. Thus, TWAZ technique is a viable techno-economical solution for development of small/medium fields. One of the benefits of the MAZ technique is the opportunity to add new azimuths to the multiplicity of the data. An original vintage NAZ or TWaz survey can be used as one of the contributing azimuths. MAZ acquisition can be considered among the many expensive WAZ techniques.