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Reservoir Detection from Seismic - Krechba Field, Central Algeria

Brian Taylor (BP)
In Salah Gas

The Krechba field is one of eight gas fields comprising the In Salah Gas project, this a joint venture between Sonatrach and BP developing gas resources located within the central Algeria Sahara. This field is a large, four-way dip closure with gas reserves within the Carboniferous and Devonian formations. Prior to the acquisition of a 3D seismic survey, reserves of 2.34 Tcf of GIIP were calculated for the Krechba Carboniferous reservoir. Development of these reserves was predicted to require the drilling of 30+ wells, during the 25+ years life of the field.

During 1997, In Salah Gas contracted ENAGEO to acquire a 3D survey across the Krechba exploitation area. The acquisition of this 3D was at the time the largest land survey acquired during one campaign in the world and required significant effort on the part of In Salah Gas to address costs and HSE performance objectives, all of which were met. Analysis of the 3D data identified a number of indicators for reservoir presence that when incorporated into the reservoir modelling exercise resulted in a downward revision of the Carboniferous GIIP volumes to ~1Tcf. Subsequent work with seismic attributes enabled gross reservoir, net reservoir and net pay thickness maps to be generated. This work has led to a seismically based assessment of the volumetric, which supports the revised numbers calculated by the reservoir modellers.

This improved understanding of reservoir architecture and sand body distribution gained from the 3D seismic has led to a revised development plan, in which:

- (i) a maximum of 8 horizontal wells are planned to drain the Carboniferous reserves,
- (ii) better well placement is achieved through seismic targeting of the most productive reservoir intervals,
- (iii) facilities are designed to correctly match the capacity of the available reserves, and
- (iv) the improved understanding of the sub-surface provides greater confidence for planning sequestration and storage of CO₂ in the Carboniferous aquifer zone.