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Exploration in Algeria – The success will continue

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Algeria petroleum exploration history followed industry-wide patterns of evolution from simple to more complex concepts and application of new technologies.

Concepts development history for Algerian petroleum systems which govern the evolution of the discoveries and thus the corresponding reserves is closely controlled by models about source rock, reservoir, temperature causing generation and over-pressured cells, migration, diagenesis, seal, traps and the degree of integration of available technologies in geophysics, geochemistry, sedimentology, drilling and logging.

Five distinct periods can be recognized chronologically following the initial phase studies associated with oil seeps observed in northern Algeria.

The searching period of conventional anticline trends dominated early exploration and led to an important number of discoveries during the fifties, mainly within the lower Palaeozoic plays in Saharan basins flanks.

Geophysics as a powerful tool for geologic evaluation has drastically improved the play concepts by providing more and more precise information than ever before resulting in detailed mapping of petroleum reservoirs. Thus regional seismic refraction engendered in 1956 the discovery of Hassi Messaoud Cambrian Oil field and Hassi R'mel Triassic gas & condensate field.

The tremendous interest stimulated by these discoveries induced a boom period for the exploration where most of the effort was concentrated around the discoveries and for the same reservoirs.

In the early sixties, the search for significant new reserves required innovative exploration methods based basically on the improvement of subsurface imagery through the extensive use of seismic reflection associated with digital data recording. This allowed the setting up of models for critical petroleum systems components.

Thus, the deepest reservoirs were targeted since 1970 for the plays already identified as potential from previous works.

Consequently, exploration effort focused on proven concepts and bypassed important plays like the Triassic in Berkine basin, or avoided some structural features as regional faults considered at that time as drains without sealing capabilities.

The period from 1986 so far, characterized by the promulgation of hydrocarbon law providing PSC contracts, observed extensive exploration effort mainly in partnership.

As a result, a revision of exploration methodologies associated with the update of current techniques occurred, mainly reinforced by the use by the partners of their worldwide experiences and models analogues.

Therefore, new petroleum provinces arise and new plays have been identified ranking Algeria in the top ten discovering countries this last decade.

Presently, recoverable reserves in approximately 320 fields located in 18 sedimentary exceed 20 billion barrels of oil equivalent. Despite these results, the exploration effort which has always been active remains insufficient regarding the area of the mining territory (1.5 million km²) where only 1400 wildcats i.e. only 9 wells / 10 000 km².

Consequently, extensive undiscovered resources remain, most of which will be found in the vast under-explored deep horizons of the producing basins as well as in frontier areas.

Six exceptional zones have already been identified: Berkine basin lower Paleozoic gas and condensate reservoirs, Ahnet – Timimoun – Reggane basins gas centered accumulations, Oued Mya Cambro-Ordovician plays, Illizi stratigraphic / hydrodynamic related accumulations, northern Algeria autochthonous Mesozoic reservoir units and finally the offshore domain which remains virtually unexplored (penetrated by only one well & two core drills and hindered by the lack of seismic resolution beneath the thick Messinian salt layer).

On top of that, tight Palaeozoic reservoirs present in most of the Saharan platform basins constitute currently on of the most important challenges facing the exploration effort in Algeria.

Thus, significant new reserves are expected in plays that have been misinterpreted or overlooked and from new other plays to be identified.