

TECTONO-STRATIGRAPHIC EVOLUTION OF PRE-SALT CARBONATES, APTIAN-BARREMIAN OF THE CAMPOS BASIN, BRAZIL

Moises Calazans Muniz¹; Dan W.J. Bosence²; Chris F. Elders³

¹ PETROBRAS; ² ROYAL HOLLOWAY; ³ UNIVERSITY OF LONDON

RESUMO: The Barremian - Aptian age carbonate rocks of the Campos Basin comprise its geological record of the continental rift phase of the breakup process of Gondwana and the formation of the South Atlantic passive margin. The oblique extensional rifting system resulted in a complex arrangement of structures with a polygonal geometric style. In this tectonic context, late synrift bioclastic rocks (coquinas) were deposited over siliciclastic rocks and basalts, followed by postrift microbialites overlain by Aptian salt. A similar tectono-stratigraphic framework can be seen in the Miocene strata of the Suez Gulf. In this work, structural styles are defined in the southern Campos Basin by their 3D seismic expression using Landmark software, Seisworks and Geoprobe. The major, presalt, structural elements mapped are: grabens, half-grabens, horsts and transfer zones. Proximal areas are dominated by half grabens that are asymmetric, bounded by extensional, planar, steep-dip normal faults, which are commonly synthetic but locally have an antithetic polarity. These faults are commonly basement involved, oriented NE-SW, some NNE-SSW (reactivated from pre-existing zones of weakness in the crystalline basement). The half grabens are dissected by a major NE-SW oriented accommodation zone. Basinward of a sinuous hinge line horst and graben structures indicate a more symmetric geometry. Growth strata associated with these extensional structures indicate significant thickness changes in the late synrift to postrift carbonate-clastic strata and sites of uplift and erosion. An erosion surface and onlap indicates the post-rift unconformity separating the late syn-rift from the postrift, or sag, phase. Early synrift strata are siliciclastic rich and infill fault-bound half-graben and graben structures. They illustrate growth strata and are absent from topographic highs. The late synrift are mixed siliciclastic-carbonate in proximal areas but dominated by freshwater bioclastic molluscan facies (coquinas) to the southeast. These show a structural control on sediment deposition with progradation off structural highs. Early investigations indicate that these carbonate platforms formed in a non-marine setting. The postrift strata also show mixed clastic-carbonate facies in proximal sites but elsewhere are dominated by microbial facies, some bioconstructional. The tectonic style and stratigraphic sequences in the Campos Basin show a number of similarities with the Miocene succession of the Gulf of Suez rift. In the Egyptian Miocene early synrift is clastic dominated and the late synrift to postrift is carbonate dominated prior to the accumulation of late Miocene evaporites. The synrift carbonate facies vary from marine photozoan carbonates through to microbial dominated platforms prior to basin restriction and salt accumulation. Furthermore, in both basins, the syn- to postrift carbonates form the main presalt reservoirs. A combination of seismic interpretation of the Cretaceous of the Campos Basin and comparisons with outcrop analogues from the Gulf of Suez are being used to develop tectono-stratigraphic models for carbonate accumulation in rift basins.

PALAVRAS-CHAVE: CAMPOS BASIN; PRE-SALT CARBONATES; SOUTH ATLANTIC.