Exploratory Plays of the Ceará Basin in deep and ultra-deep waters of the Brazilian Equatorial Margin

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The great discoveries of oil fields that occurred since 2007 in the sedimentary basins of the West African equatorial margin (e.g. Campo de Jubilee - Ghana) and more recently in its analogous regions of the equatorial margin of the South American plate, have awakened a great commercial and scientific interest in detailing the correlation of tectono-sedimentary evolution between these areas and more specifically, between their oil potentials. The objective of this study is to apply the knowledge acquired in these basins to identify possible exploratory plays in the deep and ultra-deep regions of the Ceará Basin, located at the eastern end of the Brazilian Equatorial Margin. Digital data from the Ceará Basin are being used, which were made available by the National Petroleum and Biofuels Agency (ANP), 2D/3D seismic data and well data (directional records, logging and organic geochemistry) and which are being evaluated and loaded into free software (OpendTect®). Advanced seismic stratigraphic interpretation techniques are being applied to the seismic data for the interpretation and delimitation of the main geological units corresponding to the oil-generating rocks (Eo-Cretaceous shales) and oil reservoir rocks (Eo-Cretaceous turbiditic sandstones), both recognized in the literature. The identification of the main regional structural aspects that may have compartmentalized or connected the intervals of interest or geological structure that may have conditioned the possible petroleum systems present in the Ceará Basin is also being made. Together, geochemical data analysis is being carried out to characterize the potential generating rocks and estimates of the maturation stage. Correlations of these analyzes will be made between the wells and these with the regional seismic stratigraphic interpretation. The information obtained will then be compared with the equivalent information from the West African basins, the French Guiana offshore and the Brazilian Equatorial Margin, so that comparisons in the identification and the probable analogous exploratory plays of the deep water regions can be made more surely in deep and ultra-deep waters of the Ceará Basin. If possible, a static 3D geological model of one or more selected plays will be created, containing the main interpreted lithologies, their main permo-porous properties, saturation of contained fluids and possible interfaces (water-oil-gas contacts) for carrying out calculations of oil in place volume, with the purpose of quantifying and exemplifying the oil potential of that area.

KEYWORDS: EQUATORIAL MARGIN BASINS, PETROLEUM SYSTEMS, DEEP/ULTRADEEP WATERS, TURBIDITE, PLAY, OIL ANG GAS, ORGANIC GEOCHEMISTRY, CEARÁ BASIN

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