

Identification of Stratigraphic Traps Creates New Play Concept in Guarico Sub-basin, Eastern Venezuela

Pieter Pestman¹, Masashi Hirano², Shinya Tauchi³, and Toshiaki Takimoto². (1) New Business Dept, Teikoku Oil Co. Ltd, Torre La Castellana, piso 4, ofc. 4C-4D, Av. Principal de La Castellana, Caracas, 1062, Venezuela, phone: +58 212 263 7031, fax: +58 212 263 9141, ppestman@teikoku.com.ve, (2) Teikoku Oil Co. Ltd, Caracas, 1062, Venezuela, (3) Teikoku Oil de Venezuela, San Tome, Venezuela

Large portions of the Guarico Sub-basin in eastern Venezuela consist of a gently north to northeast-dipping monocline. The sedimentary fill of this foreland basin consists of Oligo-Miocene coastal to shallow marine shales and sandstones, in variable proportions. The few faults present have a SW-NE trend and displacements of no more than a few tens of feet. Due to this, trapping mechanisms for hydrocarbons (mostly gas) have to be principally stratigraphic.

Experiences obtained by Teikoku Oil de Venezuela while operating the Copa Macoya field, one of the largest gas fields in the sub-basin, show how well data (including conventional logs, cores and image logs, as well as paleontological information), seismic data and modern analogs (deltaic and coastal deposits in the eastern USA and other countries) can be used to develop a sequence stratigraphic framework and, subsequently, sedimentological models for sandstone geometry and distribution. These models were applied to the search for hydrocarbons in previously unexplored areas.

By using this methodology, combined with geochemistry, we were able to define areas with gas potential which in the past were overlooked because of the absence of structural traps. This study contributes to the definition of the remaining gas potential of the Guarico Sub-basin and may help to increase gas reserves and gas production in Venezuela, in a strategically located onshore area, close to the northern-central portion of the country where most gas customers are located.
