AAPG International Conference: October 24-27, 2004; Cancun, Mexico

# Construction of Geologic Models for Analysis of Real-time Incidental Transients in a Full-field Simulation Model

*Robert N. Bradford[1], Mike Parker[1], **Chip Corbett**[2], Eduardo Proaño[3], Robin N. Heim[4], Christina Sonleitner[2], and David Paddock[2]. (1) Westport Resources Corporation, 5555 San Felipe, Suite 2100, Houston, TX 77056, phone: 713-548-2036, fax: 713-548-2030, bbranford@westportresourcescorp.com, (2) Schlumberger, 1325 south Dairy Asford, Houston, TX 77077, (3) Schlumberger, 1819 W. pINHOOK, sUITE 250, Lafayette, LA 70508, (4) Schlumberger, 1325 South Dairy Ashford, Houston, TX 77077*

Real-time transmission of permanent downhole gauge (PDG) pressure data provides numerous opportunities to evaluate well performance and infer reservoir parameters. The construction of a series of geologic models prior to the initial production provides a critical platform for the subsequent analysis of production data and real-time pressure information. This paper describes a method to incorporate all of the available geologic information in the numerical sub-surface model, and to include incidental transients as a history-match parameter within a full-field simulation model.

Structural interpretations in different post-stack time migrations of the 3D seismic data set provide a range of depth converted structural controls. Seismic attributed guided porosity and permeability distributions create a range of production profiles in the reservoir simulation model. Implementation of an appropriate local grid refinement, and high-frequency timesteps allow detailed pressure build-up computations. Comparison between pressure derivative curves through standard pressure transient analysis (PTA) and the simulation results improves confidence in the simulation results. Multiwell analyses allow refinement of critical reservoir parameters in the numerical simulator, such as horizontal permeability anisotropy, and permeability reduction with reservoir depletion.

This technique has substantial application for better management of unconsolidated sandstone reservoirs in the Gulf of Mexico.

Application of real-time pressure data to field reservoir management practices.

RE: Reservoir Simulation