

ABSTRACT

Opening Section – CILAMCE 2008 -November 4th to 7th, 2008 – Maceió

“Drilling through long salt intervals in Campos and Santos Basins-Brazil”

The presence of evaporite sections in locations for oil exploration, is, in itself, a factor that increases the probabilities of success in the area due to favorable conditions for the generation and trapping of hydrocarbons. On the other hand, the presence of evaporites can cause major operational problems such as stuck drilling pipe and casing collapse due to the closure of the well induced by the creep behavior of different rock salts. This presentation covers a methodology for the drilling fluid and casing design and drilling strategy for oil wells drilled through very thick salt layers. Triaxial creep tests in salt rocks (halite, carnalite and taquihydrate) were performed to evaluate and isolate reological properties to represent the creep behavior of salts under very high differential stresses and temperatures. Numerical simulation, using a finite element code developed by Costa 1984, was used to evaluate the structural behavior of wells drilled through very thick layers of salt rocks submitted to high differential stresses and high temperature in Campos and Santos Basins. Results obtained by these numerical simulations in prospects with 2000 m thick salt layers, with high creep strain rate, was used to predict the evolution of the well closure with time for various drilling fluids and analyze several technically feasible alternatives to drilling strategy. The casings were designed to support high closure rates of carnalite and taquihydrate. This methodology has been used successfully in the design of deep wells in the exploration of the pre-salt reservoirs at Campos and Santos Basins.