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

Planning and Execution of World Class Extended Reach Drilling Wells in the Development of the Chayvo Field, Sakhalin Island, Russia: A Multi-Disciplinary Team Approach

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The Chayvo Field lies 8 to 10 km off the eastern coast of Russia's Sakhalin Island. Development drilling at the field began in 2003, with the first phase comprising a series of extended reach wells drilled from an onshore location on the coast of the island. These wells extend 9 to 11 km to the western limb of the offshore Chayvo anticline. These wells are technically complex and very expensive, but can be attractive considering offshore platform costs in a remote, environmentally sensitive location characterized by seismic activity and icebergs.

A variety of challenges characterize these wells. Drilling extended hole sections at high angles results in severe torque and drag. Small errors in surveying tools accumulate over the long distances into ever-increasing uncertainty in the drill bit position. Formation evaluation is achieved with “logging while drilling” tools due to the high cost of pipe-conveyed logging. High effective circulation densities are required to ensure hole cleaning but can approach the rock's fracture gradient.

In 2002, a multi-disciplinary team was assembled to address these challenges. 3-D visualization played a key role in planning and communicating the well paths. The primary geological concern was the accuracy with which the horizontal wellbores could be placed within the oil column. Reservoir simulation has indicated the need to be within 10 m of a specified vertical depth to delay water / gas breakthrough for as long as possible. Survey tools and reservoir pressures measured during testing indicate that the first well achieved this objective.