

Cox, R., McLellan, P.J., and Dwyer, J., Considerations for Drilling of Build Sections with Coiled Tubing, Presented at the 6th Annual One-day SPE/CIM Conference on Horizontal Well Technology, Calgary, Alberta, November 12, 1997.

Abstract

Coiled tubing has been shown to be a technically viable method of drilling or completing horizontal extensions of both oil and gas wells. One of the best applications of coiled tubing drilling technology is underbalanced drilling, to counteract the reduced weight on bit and annular take advantage of the continuous circulation capabilities of coil. Coiled tubing drilling in Canada has been almost velocities as compared to conventional rotary drilling and to exclusively underbalanced. Of the approximately 100 wells drilled with coiled tubing in Canada, the vast majority has been drilled from casing set to horizontal in the target formation. Several re-entry operations have used coiled tubing, and proved the equipment technically feasible for both window milling and drilling the build section as a precursor to the horizontal drilling operation.

Several considerations should be given before deciding to drill build sections underbalanced with coiled tubing. Some of these include the need to drill the horizontal section underbalanced, comparative penetration rates between coiled tubing underbalanced and rotary drillpipe overbalanced operations, build rates achievable with coiled tubing, the relative economics of penetration rates vs nitrogen consumption, and the ability of the build section to maintain borehole stability while underbalanced. Stability concerns may need to be assessed during the drilling of the build and horizontal leg and in the longer term during the production phase.

This paper will present the results of ten coiled tubing operations involving drilling of build sections. Wellbore geometries, build rates, fluid circulations, comparative penetration rates and associated economics, borehole stability, and options for running liners both prior to and after coiled tubing operations will be presented. Of these ten operations, three experienced borehole instability in the build section. A planning process for assessing borehole instability risks will be outlined.

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