ADVANCED GEOTECHNOLOGY

Bellis, C., Bothwell, P., Burke, L., Grace, R., MacDonald, R. and McLellan, P.J., Design and Execution of Successful Well Kill on the World's Longest Running Blow-out, SPE 90542 presented at the SPE Annual Technical Conference and Exhibition, Houston, Texas, Sept. 26 -29, 2004.

Abstract

This paper reviews the history of the world's largest running blowout as well as the integrated engineering based approach taken to define the blow-out mechanism and to ultimately kill and abandon the wells. During 1916 cable tool drilling operations, Peace River Oils No.1 encountered an uncontrolled flow of salt water and gas at 345 m depth. The flow was estimated at over 30,000 bbls/d, ultimately the rig collapsed into the sinkhole and temporarily killed the surface flow. The rig was rebuilt in 1917, recovered the production casing, but again a blow-out could not be controlled and the well was left to flow 30,000 bbls/day of salt water into the Peace River. At the time of the project initiation, there was one relief well (1955), one attempted relief well (1982) and a lost well (1916). The defacto well operator, the Alberta Energy and Utilities Board contracted an integrated team of professionals including well control engineers; geologists, drilling and completion engineers, geomechanics specialists and well operations specialists to evaluate the potential of effecting a permanent kill solution. This led to a primary recommendation to re-enter the 1916 wellbore via a flowing well operation to reach total depth and conduct a well kill. The kill operation was complicated by having no production casing within the 1916 wellbore, shallow underground flows with multiple break-outs around the three wells, collapsed and parted casing in the 1955 well and entrained sour gas. The uncertainty of achieving access to the various wells to total depth and preparing for a wide range of potential well kill volumes and rates, were primary concern, as were the environmental constraints of operating on the unstable banks of the nearby Peace River.

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