SPE/IADC 119861

Axial Force Transfer of Buckled **Drill Pipe in Deviated Wells**

Menand S., Sellami H., Bouguecha A., Mines ParisTech, Isambourg P., Total SA. Simon C., DrillScan



Axial force transfer is an issue in deviated wells where friction and buckling phenomenon take place. The general perception of the industry is that once drill pipe exceeds conventional buckling criteria, such as Paslay-Dawson, axial force cannot be transferred down-hole anymore. This paper shows that, even though buckling criteria are exceeded, axial force transfer could be still good if drill pipe is in rotation. On the contrary, there exists sliding operations where lockup is observed, due to buckling, even though standard buckling criteria are not exceeded. This paper is intended to show and explain how axial force is transferred down-hole in many simulated field conditions: sliding, rotating, with or without dog legs. These new results have been obtained from an advanced model dedicated to drill string mechanics successfully validated with laboratory tests.

This paper will show applicable results for practical well operations where axial force transfer is an issue. These results will enable to give some guidelines to help the drilling engineer to select cases where conventional buckling criteria should be used cautiously. Indeed, simultaneous torque-drag-buckling calculations show that tubular can tolerate significant levels of compression, enabling to provide weight transfer to the drill bit, even though drill pipe is buckled. Others examples, in contrast, show that standard buckling criteria cannot predict the occurrence of buckling that may cause tubular lockup while tripping in the hole.

The applications of these results are numerous for all deviated wells such as horizontal or extended reach drilling wells. This paper should contribute to reduce unpredictable lock-up situations and improve axial load transfer performance.



Copyright 2009, SPE/IADC Drilling Conference and Exhibition This paper was prepared for presentation at the SPE/IADC Drilling Conference and Exhibition held in Amsterdam, The Netherlands, 17–19 March 2009. This paper was selected for presentation by an SPE/IADC program committee following reviewed information contained in an abstract submitted by the author(s). Contents of the paper have not been reviewed by the Society of Petroleum Engineers International Association of Drilling Contractors and are subject to correction by the author(s). The material does not necessarily reflect any position of the Society of Petroleum Engineers or the International Association of Drilling Contractors and are subject to correction by the author(s). Association of Drilling Contractors, its officers, or members. Electronic reproduction, distribution, or storage of any part of this paper without the written consent of the Society of Petroleum Engineers or the International Association of Drilling Contractors is prohibited. Permission to reproduce in print is restricted to an abstract of not more than 300 words; illustrations may not be copied. The abstract must conta conspicuous acknowledgment of SPE/IADC copyright.

