

BHA connections improve drillstring life, hydraulics

BOTTOMHOLE ASSEMBLY components and solutions for drillstring buckling receive attention at the 2002 IADC/SPE Drilling Conference, 26-28 Feb in Dallas. The session, "Drillstring," is chaired by **J Smith, Weatherford International Inc** and **G Beck, Nabors Drilling USA**.

IADC/SPE paper 74565, "A New Method of Choosing Connection Types and Sizes to Minimize Fatigue Failures," was prepared by **S E Ellis, T H Hill** and **K Lee, T H Hill Associates Inc**.

The current method of selecting and sizing BHA connections by specifying an acceptable BSR range is only approximate, according to the authors. Furthermore, present practice does not permit accounting for variations in thread form, makeup torque or the presence of stress relief features. Field failure experience also indicates that, in general, currently accepted BSR ranges are too

low, resulting in more box fatigue failures than pin failures.

With the new method, acceptable BSR ranges are based on equivalent stress states that account for thread form, makeup torque, pressure, applied deflection, and differences in geometry.

BUCKLING SOLUTIONS

Exact buckling solutions for horizontal wells are described in IADC/SPE paper 74566, "New Buckling Solutions for Extended Reach Wells," prepared for the Conference by **R F Mitchell, Landmark Graphics Corp**. These solutions include critical axial buckling force, a variable pitch depending on pipe lateral weight, length change due to buckling, pipe wellbore contact force and pipe bending moment. Applications of these results include estimating lockup conditions, determining loads that could cause permanent corkscrewing, and

determining seal lengths for horizontal well completions.

WEDGE THREAD TOOL JOINT

IADC/SPE alternate paper 74567 describes the special drilling applications enabled by Wedge Thread tool joints. "Wedge Thread Tool Joints: Applications and Economics," was prepared by **H A Reynolds** and **J F Greenip, Hydril Co plc**; and **A Judzis** and **A D Black, TerraTek Inc**. Series 500 Wedge Thread (WT) tool joint connections offer extremely high torque limits and a small OD/ID profile for improved drilling hydraulics.

Recent analysis of more than 4 years worth of operational data show that WT tool joint connections have lower average operating costs than API Numbered Connections (NC). In many cases, the marginal investment in a WT drill string has a payback of less than 2 years. ■