

# Good BHA, hydraulics, tubular handling lower cost

**NEW TECHNOLOGY PLAYS** an important role in continuing to improve drilling efficiency and lower costs. But there is also room for improvement in “routine” drilling operations.

A session at the 2002 IADC/SPE Drilling Conference, 26-28 Feb in Dallas, explores ways to boost performance and lower costs during common drilling operations. The session is chaired by **V Shetti, Rowan Companies Inc** and **D Heenan, Tesco Corp.**

## JAR PLACEMENT

As the complexity of well paths and the makeup of BHAs change, so should the position of jars in order to provide optimum performance when stuck-pipe occurs.

IADC/SPE paper 74551 reviews options available for drilling jar placement in various well scenarios. “How Appropriate Placement of Drilling Jars in the Drillstring Can Reduce Stuck Pipe Problems,” was prepared for the Conference by **T P Parker, Weatherford International Inc** and **I R Berne, IPE Ltd.**

Extended reach drilling, combined with high angle and horizontal hole sections and complex well paths, has increased the ways stuck pipe can occur, which in turn has had a major impact on the operational requirements and deployment of drilling jars.

This, combined with the smaller directional bottom hole assemblies that reduce the available mass and the high cost of drilling and logging tools, has placed increasing demands on jars.

## CTD IN HEAVY OIL

Coil tubing drilling (CTD) was used to complete a very successful 4 well pilot project that drilled lengthy horizontal

multilaterals into shallow heavy oil reserves at the Milne Point field on Alaska’s North Slope.

IADC/SPE paper 74553 reviews the project. “High Performance Coil Tubing Drilling in Shallow North Slope Heavy Oil Reservoir” was prepared by **M G Rixse, Baker Hughes Inteq** and **M O Johnson, BP plc.**

Three dual-lateral wells and one single-lateral well were drilled into thin shallow sands and completed using slotted liner and flow-through whipstocks. Sensors in the CTD BHA communicated to the surface with an electric line umbilical that provided extremely high-speed directional information, real time downhole weight on bit (DWOB), internal pressure and annular pressure data. The e-line also provided power to accurately drive a downhole electric orienter.

These features combined with high performance PDM motors achieved very high penetration rates with 3.75-in. PDC bits. Several North Slope CTD drilling records were set during the project.

## REAL TIME MANAGEMENT

In deepwater drilling, the need to set casing points as deep as possible is often compromised by the small operating window between the formation pore pressure and fracture pressure. As a result, the number of casing strings required is typically greater for deepwater wells. Tight pore pressure/fracture pressure margins are also frequently limiting factors on HTHP wells.

IADC/SPE paper 74552 reviews new techniques used to improve early warning capabilities. “Real Time Hydraulics Management Solutions Improve Drilling Performance,” was prepared for the Drilling Conference by **M A Smith, A Smith, R Lovorn** and **J A Greenwood, Sperry Sun Drilling Services.**

The accuracy of pore and fracture pressure prediction is enhanced through the integration of actual annular circulating pressures, characterisation of the flow-back on connections and early warning systems.

Actual measurements may be significantly different from those predicted by models.

## HANDLING TUBULARS

Exotic high alloy, high yield tubulars are being produced to deal with the high pressures, temperatures and corrosive gases encountered in today’s frontier work. Now there is a need for improved handling systems that do not rely on die penetrations to administer makeup torques or support string weights.

The design specification for most chrome tubing handling companies is the acceptable penetration depths of die marks. If these stress concentrations are visually minimised then the integrity of the pipe wall remains intact and the risk of corrosion is minimised. Unfortunately this concept has opened a market for chrome handling equipment which visually reduces markings on chrome pipe, but dramatically increases stress levels in the pipe wall.

IADC/SPE alternate paper 74554 reports on a project to model the effects of conventional camming action and cylinder driven tong jaws against their Fluid Grip System. “Detrimental Effects of Current Running, Handling and Make-up Systems for CRA Tubulars,” was prepared for the Conference by **B Philp, Frank’s International Ltd.**

## DRILLSTRING MAKEUP

Conventional “iron roughneck” technology and power tongs for drill strings were developed around standard API type drill pipe connections and do not address the newer OCTG connections like the **Hydril Wedge Thread™** design.

In addition, making and breaking bottomhole assemblies (BHAs) cannot be accommodated, requiring the drilling crew to rely on either manual rig tongs or pre-assembled components.

IADC/SPE alternate paper 74555 describes a new tong that is remotely operated inside an existing modular tong carrier/tong positioning system that also handles tongs for casing and tubing by changing tong modules. “Advancements in Drill String Makeup Reduce Time, Improve Safety,” was prepared for the Conference by **E Abrahamsen, Weatherford International Inc;** and **D F Boutwell, Weatherford Drilling & Intervention Services.** ■

