# Rigs of the future
# Wells of the future

**What's coming in the next 5-10 years? How will we get there? Let our panel of industry experts tell you.**

**Brouwer,** Shell E&P, p.18

**Orr,** H&P IDC, p.24

**Miller,** NOV, p.28

**Lacy,** BP, p.32

**Rao,** Halliburton, p.38

**Newman,** Transocean, p.42

**Iskander,** Schlumberger, p.48

**By Mike Killalea, Editor & Publisher**

THE LOW-HANGING FRUIT are long plucked, the easy elephants found. Here in this, the 21st century, the quest to feed an energy-hungry world is step changing to some formidable challenges – water depths exceeding 10,000 ft; ultra-deep wells at abominable pressures and temperatures; underpressured reservoirs stubbornly reluctant to yield its last remaining pressures.

What's an ingenious industry to do?

DC pondered that very question and took it to the people that should know best – battle-tested drilling veterans in operating, drilling and service companies. DC recently conducted conversations with 13 drilling and completion specialists to gain a sense of their vision on where the industry is and where it needs to be in the next 5-10 years. What we found was a heterogeneous blend of the pragmatic and the visionary.

"In the current outlook," observed **Kevin Lacy**, head of discipline-drilling & completions, **BP**, "many people in the industry are starting to think about what we will need in the long term. The good news is that most operators have a healthy cash flow, and rig rates are healthy, so it's an appropriate period to look at new technologies. I see some neat stuff in that 5- to 10-year time frame, with newer technologies starting to mature."

**Sjoerd Brouwer**, wells activity leader for **Shell E&P**, points to the need for machines capable of drilling and completing in waters far deeper than we work in even today. "We need rig technologies that allow us to work with smaller crews, more automation and more safety," Mr Brouwer remarked. "These technologies should reduce the unit cost for subject developments. It's the development of these new rig technologies that will make the difference."

Downhole, participants pointed to a range of promising technology and pressing needs.

"Finding ways to get more hole sections by using unique ways to keep wells under control is going to be a big step," explained **David Payne**, vice president-global drilling & completions for **Chevron**. "It is going to have a big impact in deepwater where we have fracture gradients that come close to pore pressure. It will also have applications in some of the deep HPHT work as well."

Expandables and the quest for a true monobore, managed pressure drilling, rotary steerable systems were roundly seen as answers for the future. But so were enhanced well control, better flow-detection systems, improvements in understanding real-time actual formation pressures, and more.

Our subjects were in accord on a number of issues, but — as often is the case with those of strong opinion — the thinking diverged on certain key points.

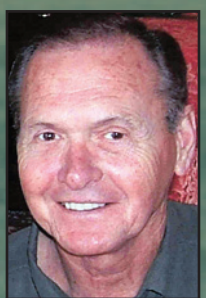
Take rig automation, for instance. In one camp are those who contend that automation neither enhances safety nor streamlines operations, at least in some applications. Counterpoint are those voices pointing to rig automation as a major step change forward.

We'll step back and let these 13 thinkers present their own ideas. You be the judge.

**Payne,** Chevron, p.50

**Childers,** Atwood Oceanics, p.54

**Oppelt,** INTEQ, p.56



**Brazzel,** Bandera Drilling, p.58

**Hinkel,** Enventure, p.60

**Cole,** Scorpion Offshore, p.62