

# DRILLING AHEAD

## DEA Workshop papers let you — not HPHT woes — eat your lunch

**Mike Killalea, Editor & Publisher**

IF YOU MISSED the recent Drilling Engineering Association Workshop in June — and there are a few of you out there I didn't see at the conference — you missed a great opportunity to learn about solutions to problems plaguing today's drilling operations, with special emphasis on HPHT wells.

"We saw some technology here that we can put to work right away," remarked DEA chairman **Morris Keene** of **Oxy**. The workshop was titled "Drilling & Completing Deeply Buried Reservoirs: What's Eating Your Lunch?" and was endorsed by IADC.

The papers were all about ensuring that drilling and completion pros receive their due caloric intake and avoid operational heartburn.

"I learned about several new ideas here," commented one seasoned drilling engineer with four patents under his belt.

### SUPER-CEMENT

Take Super-Cement, for instance. A presentation by **Fred Sabins** of **CSI Technologies** discussed the results of a recent project to devise innovative materials for creating annular seals and long-term integrity in deep, hot wells. Long-term zone isolation is a real problem in HPHT wells, complicated by difficult placement, a function of well deviation. Further, the cement must contend with high-density (17-20 ppg) well fluids, high-pressure gas and gas migration, narrow annuli with high friction, CO<sub>2</sub>/H<sub>2</sub>S, and other headaches.

The team ultimately determined that non-expanding cements fail in tension, but that controlled cement expansion creates a compressive preload, which increases cement tensile strength. The conclusion was that expanding cement effectively increases the nominal cement tensile strength by 2,600 psi. The project is now ready for full-scale field testing.

### MULTI-STAGE FRACGING

Another presentation of interest was by **Rocky Seale** of **PackersPlus** on an

open-hole completions system specifically designed for multi-stage fracturing and stimulation, with emphasis on deep, horizontal wells. This presentation is outlined in a detailed article elsewhere in this issue (p 112). The system comprises a mechanical open-hole packer system capable of withstanding high differential pressures, with fracturing ports located between the packers, Mr Seale said. To date, there have been more than 600 installations, with 3,000-plus stages fractured using 200 MM lbs of proppant — in excess of 1.2 MM ft of horizontal open hole, with sizes ranging from 3 3/4-in. to 12 1/4-in. and in a variety of formations.

### DYNAMIC FEA

Another highly rated presentation covered a better way to understand down-hole behavior using dynamic finite-element analysis. Speaker **Mark Frenzel** of **Smith Technologies** explained that use of dynamic FEA can optimize the dynamic performance of the whole drill-string, capturing rock and cutter interaction, as well as system forces. The goal is to improve drilling system behavior; increase drilling efficiency; reduce shock damage and improve wellbore quality.

The process allows for "what if" scenarios — virtual changes of bits, BHAs, underreamers, evaluation of each change over a range of drilling parameters, and so on.

The results of a well-detailed case history showed multiple benefits — 87% reduction in trip time; better understanding of damaging processes; quick and uneventful subsequent logging and casing operations; improved dull bit and underreamer conditions, compared with offsets; and development of new best practices.

These are just 3 of the top-notch presentations DEA hosted on 19-20 June in Galveston. I've barely scratched the surface of their technical content, and regrettably lack room to abstract the remaining fine papers. But don't be dismayed. Watch for full technical articles here in DC. Don't let problems eat *your* lunch.

*Have a comment? You can reach Mike Killalea at [mike.killalea@iadc.org](mailto:mike.killalea@iadc.org).* ☯