Faster plug- and-perf completions

A new composite frac plug maximises the efficiency of “plug-and-perf” completions by reducing time on location, according to Weatherford, which introduced the TruFrac plug at the recent Intervention and Coiled Tubing Association (ICoTA) Conference and Exhibition in Houston. The plug is rated for use in environments with temperatures up to 300°F (149°C) and pressures up to 10,000 psi (689 bar).

“It has very little metallic content, which makes it easy to mill up,” says Matthew Crump, Weatherford’s global product line manager for composites.

The plug can be used in single- and multiple-zone stimulation operations in vertical, deviated, horizontal, or multilateral wells. When deployed in horizontal wells, the TruFrac plug can run in hole at a speed of up to 490 feet per minute, compared to typical run-in speeds of 45 to 60 feet per minute of competing plugs, Crump says.

The plug is shorter than typical frac plugs and features a lower slip that combines high-strength composite and small, hardened inserts to provide better anchoring force with minimal metal.

Weatherford deployed the TruFrac plug to help an operator in the Eagle Ford reduce mill-out time to an average of 10.5 minutes per plug from the industry average of 25 minutes per plug, the company says.

Low-emission mission

Shell has taken delivery of the Harvey Energy, the first of three offshore supply vessels under charter from Harvey Gulf International Marine mostly fuelled by liquefied natural gas. Equipped with three dual-fuel Wartsila engines, the OSV will run on 99% LNG fuel and will be able to operate for around seven days before refuelling. The 92-metre long vessel will load from Harvey Gulf’s new LNG bunkering facility at its Port Fourchon, Louisiana, terminal and serve Shell’s offshore platforms, including the new Olympus production platform, bringing equipment and drilling fluids.

The Harvey Energy is the first vessel of its kind in the region to run on both LNG and diesel. LNG fuel is a new alternative for vessel operators in the Gulf of Mexico in response to new sulfur and nitrogen oxide emissions regulations.

Increasing SAGD efficiency

Halliburton has introduced the EquiFlow OptiSteam flow control device for steam-assisted gravity drainage (SAGD) injectors that the company says will help operators maximise production efficiency and improve steam-oil ratio by balancing steam injection throughout the length of a completion. The new device is field adjustable, giving operators the ability to make well site changes to the flow settings. An optional sleeve provides operators control of steam injection, promoting uniform steam chamber growth.

More than 100 EquiFlow OptiSteam devices had been installed, the service company says. Operators typically use more than one device per well, particularly if they need to target specific locations with customised steam injection rates. A typical SAGD project produces tens of thousands of barrels per day of oil, requiring three to four times this amount of water for steam generation.

The device is particularly suited to Canada’s oil sands, where a major operator is using the EquiFlow OptiSteam devices to control steam injection points along a horizontal well.

Enhanced fracture networks

Baker Hughes has developed the REAL Connect service to improve recovery rates following fracturing operations. The service’s diverters redirect frac fluid flow to untreated perforation sets within a stage to increase fracture network complexity and provide more uniform coverage. Once the stimulation treatment is complete and the diverter materials dissolve, ultra-lightweight propellant material remains in the near wellbore for long-lasting production flow paths.

The service helped an operator in Louisiana rejuvenate several mature wells from an inventory of unconventional wells reaching the low end of the production curve. Baker Hughes designed a re-fracturing programme that used the REAL Connect service to temporarily isolate existing fracture networks to redirect fluids to untreated zones and stimulate untapped portions of the reservoir.

The service enabled a more effective re-fracture, enhancing the fracturing networks and increasing ultimate recovery from the reservoir without drilling new wells, the company says. Based on the average drilling and completion cost of $10.1 million and re-stimulation cost of $3.1 million, the service company estimates it saved the operator an estimated $7 million per well.