



OTC2017

HART ENERGY

| THE OFFICIAL 2017 OFFSHORE TECHNOLOGY CONFERENCE NEWSPAPER | DAY 1

OTC EXTRA: Two Winning Technologies Enable Better-Informed Decision Making

CONTRIBUTED BY SCHLUMBERGER

Optimizing the poststimulation flowback of hydraulically fractured wells is a significant challenge for the oil and gas industry, and protecting the investment made in a complex multistage stimulation operation has become a must in the current cost-constrained environment. Today, operators tend to look for the services that protect the connection of hydraulic fractures to the wellbore to optimize productivity in both conventional and unconventional wells.

The new AvantGuard* advanced flowback services address these challenges by optimizing well performance from poststimulation operations through production. Ongoing, real-time monitoring ensures the well is being operated within a secure operating envelope (SOE)—protecting both the hydraulic fractures and the ROI during the lifetime of the well.

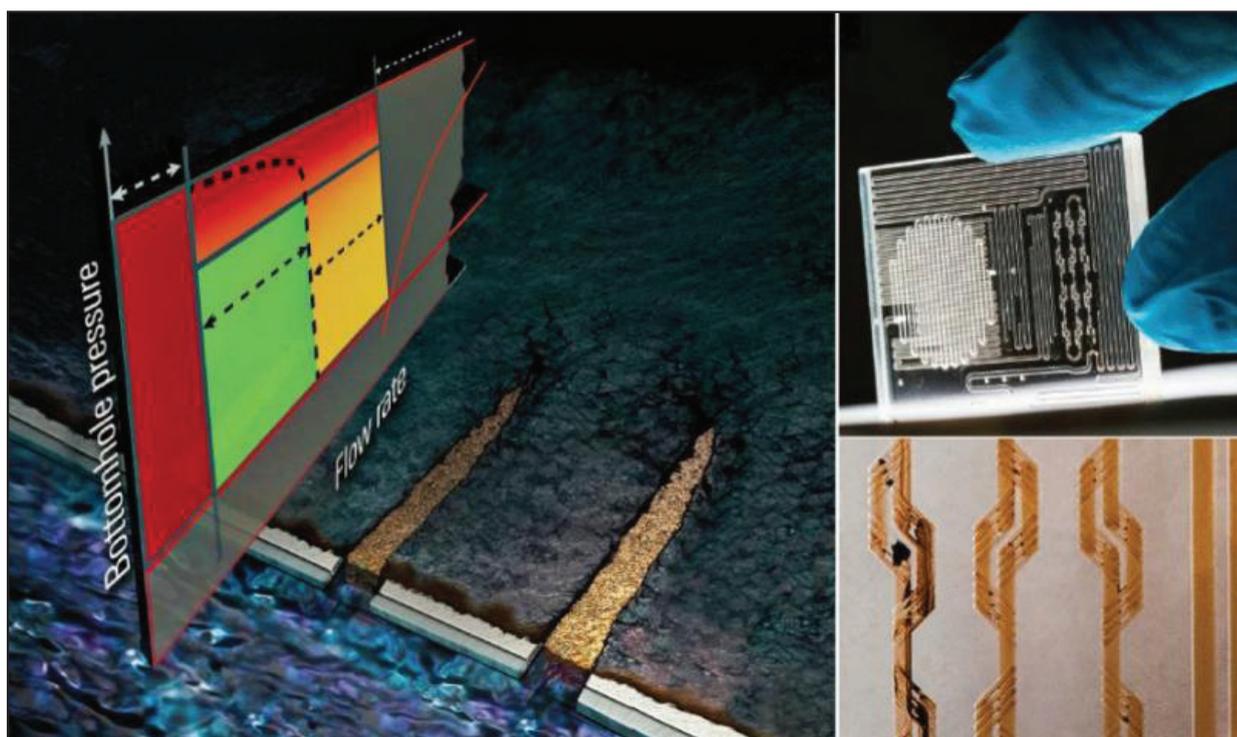
Damage to the well and the formation is actively prevented by tailoring a predictive flowback design strategy with well-defined operational parameters that preserve the connection between hydraulic fractures and the wellbore—compared with conventional rate transient analysis used for identifying postfracture impairment.

These parameters are defined from real-time pressure and production data, including solids production monitoring. Changes in production rates are measured using the Vx Spectra* surface multiphase flowmeter, which accurately captures multiphase flow dynamics in any flow regime for all fluid and solid types.

Application of the services for predictive flowback design during the transition to production protects and stabilizes hydraulic fractures to efficiently enable all the clusters in each zone to produce without productivity impairment. Advanced characterization of well performance also enables an optimal choke management strategy that preserves the connection between both the hydraulic fractures and the wellbore.

In more than 50 operations conducted to date in unconventional plays including the Eagle Ford, Haynesville, Permian and Bakken shales, the new services guided active control of coiled tubing injection parameters and the wellhead choke has kept wells in the defined SOE to protect fracture connectivity and productivity.

The AvantGuard services is the winner of the prestigious 2017 Special Meritorious Awards for Engineering



Innovation (MEA) in the hydraulic fracturing/pressure pumping category.

SARA analysis—reinvented

Determining the representative composition of saturates, aromatics, resins, and asphaltenes (SARA) is necessary for field development planning—from the reservoir to the wellbore to the pipeline. With many critical decisions relying on this data, it is important to get it right the first time, every time. Even slight variance in the accuracy of SARA measurements can cause detrimental damage across the life of field and incur significant cost and NPT.

With the launch of Maze* microfluidic SARA analysis, operators can now achieve highly accurate measurements on every oil sample, across all labs, with a smaller environmental footprint. This technology is powered by the oil and gas industry's first commercial application of microfluidic chip technology, which has been accepted by ASTM International Standard D7996 as the best test procedure for measuring asphaltenes.

Conventional technology for SARA analysis is cumbersome, time-consuming, and highly dependent on technician subjectivity. The process is demanding on

both the laboratory staff and equipment, without providing consistent data.

The Maze analysis completely removes the previous analytical and operational barriers, improving precision and reducing turnaround time by more than 85%. Now, operators can be certain that their SARA measurements are always repeatable and reproducible.

The automation provided by the new analysis eliminates laboratory technician dependency for precise fluid measurements. Turnaround time for Maze analysis is only 4 hours compared with conventional technology at 3 to 5 days, and use of solvents is decreased by more than 85%.

Results from the Maze microfluidic SARA analysis have industry-wide—both upstream and downstream—applications, including validating oil samples prior to PVT analysis, understanding physical and refining properties, assessing crude oil value, and supporting flow assurance and geochemical studies.

The Maze microfluidic SARA analysis is the winner of the 2017 MEA award in the intelligent systems and components category.

For more information about the AvantGuard services and Maze microfluidic SARA analysis, visit Schlumberger booth 2415. ■