Projects Offer Solutions To Problems Found In Field

As 2013 comes to an end, I have been reviewing the vast array of technology and innovation being developed across the oil and gas industry. There are so many solutions, so many trainings, and so many folks coming up with the next best thing that it can be difficult to sort through it all.

Undeniably, this is a very exciting time as oil and gas companies look at new ways to stay competitive, research scientists develop solutions to industry challenges, and non-oil-and-gas companies find cross-over applications for technology that can be used in the field.

Part of my job is to sort through it all and identify the problems that are most in need of solutions in the field, find the right experts who are working on those solutions, and get everyone into the same room to get that technology up and running in the field.

I have come across five technologies I think are worth a second look. Some solve old problems that folks have been dealing with for years and some look to solve issues that are emerging as state and federal regulations tighten around the oil and gas industry.

The first is a Web-based application aimed at providing expert information to users in an online format. The project called “A Self-Teaching Expert System for the Analysis, Design and Prediction of Gas Production from Shales (RPSEA 11122-53)” links Texas A&M University, the University of Houston, Anadarko Petroleum and BGI Resources, and utilizes an industry fed database. This database incorporates a geological model as well as geophysical, fracturing, reservoir and production data. By using actual data, this database makes field information available to independent operators and enables them to design more productive systems without compromising the confidential information that was used to grow the database.

Another group composed of folks from the University of Texas at Austin and Baker Hughes has completed a project to develop nondamaging fracturing fluids and proppants specifically designed for gas shale reservoirs that minimize water use. Using lightweight proppants combined with foam was tested to maximize fracture length while minimizing formation damage. The major findings of the project, “Improvement of Fracturing in Gas Shales (RPSEA 07122-38),” include greater proppant transport with less settling in shale environments using foam and low-density proppant.

The Texas Engineering Experiment Station has completed a project called “Low Impact Testing of Oil Field Access Roads: Reducing the Environmental Footprint in Desert Ecosystems (RPSEA 07123-01).” Its goal is to collect quantitative information on the performance of novel low-environmental-impact lease road construction alternatives. The group also evaluated alternative construction materials and methods designed reduce the footprint of oil and gas operations in ecologically sensitive desert locations. Among their key findings, researchers discovered that constructing lease roads with materials that were easily removed and using recycled drilling waste both saved money and reduced the environmental impact of field operations.

CSI Technologies, Texas A&M, Ampak Oil, and Burleson Cooke LLC have come together to complete yet another project, called “Creating Fractures Past Damage more Effectively with Less Environmental Damage (RPSEA 09123-20).” The unique approach of this project was to create a cost effective and environmentally friendly fracturing process specifically designed to serve fracturing treatments using less than 50,000 pounds of proppant to fracture past wellbore damage. The process uses a novel fluid that dissolves, leaving no permeability-plugging residue. The process uses substantially less fluid and is designed to deliver optimal proppant pack distribution. Additional benefits include the need for less horsepower and mixing equipment on the job site, resulting in a reduced footprint.

In a project that is scheduled to complete in July, the Lawrence Berkley National Laboratory is looking into the impact of seismic stimulation on oil production. The project is called “Seismic Stimulation to Enhance Oil Recovery (RPSEA 07123-06).” It conducts well-controlled field tests at fields where production is declining, and models the mechanisms involved as well as evaluates where seismic stimulation may be applied.

As I look back on just the last few years, it is amazing how many inventions and new processes have come to market in an effort to make industry better, faster, safer and cheaper. These are only a few examples of how companies and science are coming together to solve issues in the field and continue to evolve the industry. I am eager to see how technology continues to advance in the coming year, and I look forward to sharing those technologies with you. Happy New Year.

For more information on these and other innovations occurring in the industry, attend a local PTTC workshop or visit RPSEA.org to learn how research and development is changing the industry.

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