Integrating Petrophysics with Subsurface Workflows

A novel integrated solution brings new efficiencies to the exploration and production lifecycle

By Halliburton

Any oil and gas company’s net worth depends in large part on the amount of reserves it has in the ground. Critical parameters in the equation that determines original hydrocarbons in place come only from petrophysical analysis and interpretation. The end product, of course, is accurate volumetrics. But existing subsurface models must be updated with every new well drilled in the reservoir or field. And existing logs are continually reprocessed and reinterpreted in field development and mature assets. Why, then, is well-log analysis still disconnected from subsurface workflows across the E&P lifecycle?

“With current petrophysical technology, log analysis takes place largely on an island some distance from the mainland of 3D subsurface interpretation, earth modeling, and reservoir characterization,” said Pom Sabharwal, global innovation and marketing manager for Landmark, a Halliburton business line. “Lack of good applications send a boat across from time to time to transfer tools and data, but no one has built a bridge going both ways — until now.”

With the release of DecisionSpace Petrophysics software, Landmark is closing the gap between petrophysics and critical geoscience and engineering workflows, which now take place on a single integrated platform. “DecisionSpace Petrophysics is the industry’s first end-to-end formation evaluation solution,” Sabharwal says. “Built on the DecisionSpace Enterprise E&P Platform, it delivers integrated single-well, multiwell, reservoir-, and field-level petrophysical capabilities covering the full breadth of the asset lifecycle from acquisition through reservoir characterization.”

According to Sabharwal, existing petrophysical tools suffer two significant deficiencies. First, those tools are designed primarily for analysis of a single well or, when necessary, a handful of offset wells. Second, as noted above, even well-known log-analysis packages are poorly integrated, if at all, with other geoscience applications and E&P data management systems. Log curves and results are stored either in flat files or proprietary databases. What differentiates Landmark’s new solution, he said, is that it can handle wells throughout the entire reservoir characterization at once, and petrophysical analyses can automatically update any 2D or 3D subsurface static or dynamic models, without importing and exporting data — indeed, without manual intervention.

How does this work? The DecisionSpace Enterprise Platform incorporates a full range of E&P information management systems — including the Recall borehole data management solution and OpenWorks, a widely adopted E&P project data management technology. Unlike individual log-analysis tools, these solutions are capable of efficiently handling large volumes of raw and interpreted data.

“We developed both of these databases and have integrated them to provide seamless workflows,” Sabharwal said. “We provide automation with DropSite to speed the delivery of new LAS files from the field via the cloud. And we provide 500 prebuilt, yet customizable rules for loading, quality controlling, correcting, and publishing high-value borehole information.”

As a result, DecisionSpace Petrophysics users can centralize and accelerate access to data, process and interpret logs and curves quickly, and dynamically update existing models with their latest analyses and interpretations.

After meeting with well-log analysts and asset teams at several different oil companies, Sabharwal learned that, on average, petrophysicists spend 30% to 40% of their time trying to find the right logs, even before they begin analyzing or interpreting the data. What’s more, it typically takes about two weeks for them to obtain quality-controlled well logs from the acquisition company. “With integrated and automated solutions, they will gain new efficiencies,” he said. “They’ll spend more time on in-depth formation evaluation workflows, reducing reservoir characterization activity from weeks to as little as days, and gain new insights across the life cycle of the well, reservoir and field. Imagine having the ability to take your petrophysical analysis and have your structure models, property maps, and static earth models respond to it dynamically.”

Landmark will introduce the initial version of DecisionSpace Petrophysics to early adopters this fall, and Halliburton’s formation and reservoir solutions group will adopt the platform to deliver its own petrophysical services. Halliburton will extend the technology with a range of proprietary processing and interpretation plug-ins, some of which will become available for Landmark to commercialize in future releases.

For more information about petrophysics solutions from Landmark, visit www.landmark.solutions or visit booth 1835.