Energy Case Study

Decision Support

Engineering Firm Assesses Gulf of Mexico Deepwater Production Performance Using IHS Data and New Analysis Techniques

The Source
for Critical Information and Insight™

Case Study

Business Benefits

- Houston-based deepwater Gulf of Mexico geologists and engineers wanted to help oil and gas operators better understand and manage their deep-water Gulf of Mexico interests, which are often technically and geologically challenging as well as costly.

The IHS Solution

PetroSolutions Ltd., in conjunction with IHS, conducted an unprecedented study that analyzed production performance in most deepwater Gulf of Mexico completions. To perform the study, researchers used the IHS comprehensive Gulf of Mexico well, production and log data, in combination with commercially available applications, including the IHS powerful set of engineering analysis tools. Ultimately, the study yielded previously undetected reservoir performance parameters that may change how E&P professionals analyze their deepwater assets.

The staff of PetroSolutions (PSL), a Houston-based E&P consulting firm, has been analyzing and interpreting Gulf of Mexico projects since the 1970s. According to Tom Harris, a founding partner of PSL, there continues to be tremendous worldwide interest in the deepwater Gulf of Mexico. However, as oil and gas activity in the Gulf has moved to deeper and deeper waters, he said, the costs and risks of exploration and development have risen substantially.

"When oil and gas managers, geologists and engineers are responsible for the success of projects in which offshore

PetroSOLUTIONS LTD

platforms may cost in excess of one billion dollars and individual wells cost $50 million," Harris said, "it is critical for them to understand whether the performance of current fields and the wells they contain are meeting expectations."

"The high-entry and development costs, the need for technological expertise, and the need for a thorough understanding of deepwater reservoirs, are barriers to entry into the deepwater for many companies," Harris added. "And once a company overcomes these barriers and invests in deepwater drilling," he said, "the proper development of fields, and efficient management of reservoirs and production are critical to achieving a return on the company's investment."

"Using production data, we are able to match up a reservoir's permeability thickness and incorporate that into a geocellular model, which hasn't been done before. And, therefore, we were able to see how production panned out over time. Production data is the ground truth — it is the reality of a reservoir's performance."

Tom Harris, Founding Partner

Production Data is Truth to Understanding Reservoir Performance

Familiar with the challenges of operating in the deep waters of the U.S. Gulf of Mexico, PSL and IHS saw an opportunity to help companies better understand and manage their deepwater assets by conducting a comprehensive production performance study on deepwater Gulf of Mexico completions.

The study, which is the first of its kind to cover most of the completions in the deepwater Gulf of Mexico, provides analyses of production, test and pressure data on 45 producing fields (reservoir and completion basis) in the deep waters (1,000 feet or greater in depth). Based on corresponding depositional environments and fluid types, the Deepwater Gulf of Mexico Production Performance Study presents new ways of examining existing data and illustrates how readily available information, when combined with a suite of innovative software applications, can provide new insights into production performance.

The entire study was produced using IHS well, production and log data. The data was analyzed using IHS engineering software suite, including Power Tools® (economic/decline-curve analysis), PERFORM™ (reservoir NODAL™ analysis), OilWat™ and GasWat™ (material balance analysis), and PVTLIB™ (pressure-, volume- and temperature-fluid properties and correlations).

"Our goal with the study," Harris said, "was to look at reservoir performance and benchmark how these reservoirs have been performing over time. With so much money and resources invested in deepwater wells, offshore operators don't like surprises. They want to know if their wells are meeting production expectations, and if any of their wells are under-performing, then they need to determine why," he said. "The well may be sanding up or experiencing water encroachment, or there may be wellbore damage or a mechanical problem, but it is imperative for the operator to get answers quickly or face more costly challenges later."

"With IHS well, production and log data, we have a wealth of detail-rich data available, and using a suite of engineering applications, we were able to robustly interrogate and analyze that data in new ways," Harris said. "From an engineering standpoint, this is very exciting because, during the course of this study, we were able to see things in the data that were below seismic resolution and that we have never seen before. For example, we can now demonstrate — using production data — the number of acres that are being drained from a reservoir, which is unprece-dented," he said. "Again, using production data, we are able to match up a reservoir's permeability thickness and incorporate that into a geocellular model, which hasn't been done before. And, therefore, we were able to see how production panned out over time. Production data is the ground truth — it is the reality of a reservoir's performance," he said.

As a result of their investigation of the deepwater Gulf of Mexico completions, Harris said new entrants to the area, as well as seasoned operators, will be able to draw from the analyses to improve operational efficiency of their deepwater projects, and they will gain a more complete understanding of deliverability and recovery potential by depositional facies and hydrocarbon phase.

"An operator can use this study to help determine appropriate facility size and the number of wells needed in a field to optimize a depletion plan," Harris said. "We make this possible because we provide detailed information regarding similar depositional environments and fluid types. We also enable the operator to see what other companies have done in similar environments."

"Our initial presentations of the study to the industry have been met with a great deal of enthusiasm and have generated a good bit of dialogue, not only about deepwater activity in the Gulf, but about data in general," Harris noted. "In fact, in addition to showing clients the study and what the study can do for their Gulf of Mexico assets, we're getting tremendous feedback in terms of IHS data itself. Consistently, we're hearing people say 'I had no idea you could extract that level of information from IHS data,' but the fact is, IHS has little gems and kernels of data that many people don't know about. In many cases, it is data their company already owns, but they don't tap into it — it's like leaving gold behind in the mine."

The Source
for Critical Information and Insight™

For more information

US	+1 888 OIL DATA
UK	+44 (0) 1666 501226
Canada	+1 877 495 4473
Web	www.ihs.com/energy