

# 'Disconnect' seen in industry's use of technology

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Editor

With the perspective of a geophysicist who has worked as both an operator and service provider, Steven Tobias sees a troubling "disconnect" in the upstream oil and gas business.

"At the same time that you have high-technology service companies scrambling for work, there are large companies wondering why they can't generate prospects or develop fields properly," says Tobias, a cofounder and vice-president, exploration, of South Bay Resources LLC, Houston.

The problem isn't the absence of technical tools; rather, it's the absence of time and sometimes inclination of professionals at oil and gas companies to learn about them.

"There are very few stupid or bad people left in the business," Tobias says. "But when the exploration manager gives you a task to do and you have to work these many blocks for the sale or these fields, you don't have time to learn all these new technologies."

Tobias and his two partners in the private operating company they founded just over a year ago are, as he describes it, applying big-company technology to small-company prospects. The firm has discovered commercial hydrocarbons in two out of the three wells it has so far drilled to previously overlooked targets in a mature area of Matagorda County, Tex.

Tobias's experience with highly technical exploration goes far beyond the Texas Gulf Coast, and his professional interests extend into the organizational dynamics of oil and gas companies.

While international exploration manager with Pogo Producing Co., Houston, he generated the prospect that led to the 1995 discovery of Benchamas oil field in a then-dormant area of the Gulf of Thailand. And for 7 years before the start-up of South Bay Resources, he ran a high-tech consultancy called Energy Outpost Co., which he describes as "an asset team for hire."

He thinks everyone at oil companies should experience life as a service provider.

"When you do service work, you gain an appreciation for things like marketing," he says. "No matter how good you are, you need the business context to apply your talents or it's all for naught."

At Energy Outpost, where he handled projects in the US, Southeast Asia, and Europe for more than 20 clients, Tobias learned how different companies can be.

"The variability of quality from company to company is truly shocking," he says. "Some companies are just in reaction mode to the last management issue. Others have corporate cultures that encourage excellence. Being an outsider and coming in and seeing companies, I got a real appreciation for the role of corporate culture."

Because exploration is inherently creative, Tobias says, culture must foster creativity.

"When people are afraid, they're not creative. When they're not creative, they're not learning new technology. They're not generating prospects. So corporate culture is very important."

## 'Back-breaking' work

At South Bay Resources, Tobias, another

geoscientist, and an engineer combine computationally intense integration with what he describes as "back-breaking" work. The approach borrows from Tobias's experience as a consultant, emphasizing a rigorous process applicable to a variety of prospects.

The process aggressively integrates 3D seismic data with all available engineering and geological information. It applies integration tools used in the North Sea, off West Africa, and in the deepwater Gulf of Mexico—but not in small on-shore prospects in places like Matagorda County. A reason many operators shun such comprehensive integration in small prospects may be the amount of work involved.

"You've got to take 700 wells, and you digitize them," Tobias says, using his company's work in Matagorda County as an example. "You've got to go through the production histories and tie that to the wells and tie all those to the [seismic] attributes, make synthetic seismograms to develop a good understanding of the [sonic] velocity structure. You have to tie drive mechanisms in as well to understand how to interpret the attributes."

"That type of back-breaking, integrated work is tough to do. Not many people do it."

The system statistically correlates engineering and geologic data with tradi-



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tional seismic attributes such as frequency, amplitude, and phase as well as attributes related to amplitude variation with offset (AVO).

"We put it all together using neural networks and pattern recognition," Tobias says.

In Matagorda County, the analysis revealed compartmentalization of the subsurface that he characterizes as "very, very stratigraphic."

He says new drilling targets emerged in the mature producing area like this:

"We came in looking at some shallow reservoirs. These shallow reservoirs had log character that hung in there well after well. Our geologist said, 'It looks like we won't have any stratigraphic traps here. Everything seems to hang in.' And the seismic seemed pretty continuous.

"So we went deeper, and we were looking at reservoir after reservoir. And then we started looking at the engineering and noticed production anomalies, different production histories, pressure histories. What we found was that despite what the logs were saying there was some compartmentalization in there.

"We went back to this zone we'd overlooked [in Oligocene Frio], and we very carefully analyzed the seismic response. And we found that someone had drilled a bright spot nearby, and that was a wet well. Someone else had drilled what seemed the opposite, kind of a dim spot, and that was also wet. But there were enough penetrations that we did a very detailed analysis of the good wells and the bad wells and came up with maps that showed targets.

"When we compared seismically derived compartmentalization maps with the engineering we found a very good correlation. And they were stratigraphically controlled correlations. We went in and drilled our first well, and it was a discovery. And that's pretty much what we're doing. We're finding stratigraphically and structurally controlled correlations and pursuing them."

South Bay Resources concentrates on targets above geopressure, which means smaller but cheaper targets than those that larger companies pursue.

"But in going for the smaller targets we're coming across overlooked large

targets as well," Tobias says.

### 'Enormous' potential

He considers the potential for discoveries like those "enormous." But tapping that potential requires a fresh geologic approach.

While he was still a consultant, Tobias found that his work applying high technology to exploration was showing "extremely strong stratigraphic control to hydrocarbon accumulation." But exploratory practice remains oriented to structural control.

"To this day in nonbright-spot explo-

## Career highlights

Steven Tobias is a cofounder and vice-president of exploration of South Bay Resources LLC. He, Steve Slack, president and chief executive officer, and Scott Rubsamen, vice-president of engineering and operations, formed the firm late in 2002.

### Employment

He has worked as an exploration specialist for Mobil Corp., Tenneco Inc., BHP, and Pogo Producing Co., managing projects in Louisiana, Oklahoma, Texas, the Gulf of Mexico, Australia, Nigeria, Indonesia, and the Carpathians. In 1996 he became president of Energy Outpost Co., providing prospect generation and field development and exploitation planning services to oil and gas companies.

### Education

Tobias holds a degree in geology from Queens College and a master's degree in geophysics from Pennsylvania State University.

ration it's really tough to sell stratigraphic traps," Tobias says. "It just is. Systematically, the industry has drilled structural traps, and now we have the tools that are showing that there are a lot of stratigraphic traps. There are tools that deliberately find stratigraphic traps that are not being used because people don't know how to use them."

Asked about technologies that haven't yet delivered to their full potential, Tobias cites underbalanced drilling—which he calls "a big sleeper"—and AVO. A mistake often made with the latter is insufficient sampling.

"We confine our AVO understanding to very small areas and very thin volumes of rock because AVO changes enormously if you're in pressure, near pressure, above pressure," Tobias says. "You go 2-3 miles away, and you find different responses." He adds that his company couldn't have made its discoveries without AVO.

On the use of technology in general, Tobias advises companies to emphasize teamwork and keep technology in a business framework.

"Because it's integrated, you can't have one geophysicist or one paleontologist getting really good without working within a matrix of other people, guided by someone who's really top-notch," he says. "Those are the key personnel who really make or break a company."

The business context needs to be a portfolio of opportunities.

"The greater the risk, the larger the portfolio needs to be," Tobias says. "When a company thinks they have a magic bullet and a good technology and they go into some fairly high-risk ventures, they're really asking for trouble."

Investors, he adds, tend to focus on geologic trends. So companies with records in specific areas are the ones that most easily attract capital.

"But they are neither scalable nor transferable to other areas," Tobias says. He wants South Bay Resources to be different, explaining, "We're not offering prospects; we're offering processes."

It's an approach he developed as a consultant—by necessity.

"I'd have to go in, figure out what they were doing, generate prospects, and then finish all within 2 weeks maybe or not get paid," he says. "Over the years I had no choice but to develop a template that would work everywhere."

It's no surprise, then, that South Bay Resources doesn't plan to confine its operations to Matagorda County, or Texas, or even the US—or its scope to small targets. It's looking for projects in Canada and overseas and talking to companies with large fields in late stages of depletion.

And Tobias sees "great synergies between large companies that don't have our speed and agility and ourselves." ♦