

Contractor focuses on new technology

The smorgasbord of new land acquisition systems might seem overwhelming. Global Geophysical helps sort out their advantages.

AUTHOR

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The oil and gas industry is noted for risk-taking and a can-do attitude on the part of its participants — excitement is so much the norm, it's near-impossible to become jaded.

For instance, the emergence of a new company and its ability to quickly become a recognized force within its specialty field is always intriguing to observe.

An example is geophysical services provider Global Geophysical, which launched its first crew in May 2005. It has since deployed crews in numerous areas around the world, including such far-flung locales as Georgia in the Former Soviet Union.

Perhaps even more notable than the company's widespread presence geographically is its successful effort to be at the forefront of new seismic technology applications wherever it goes.

A particularly exciting project now underway at the company entails a 145-sq-mile (375.5-sq-km) 3-D shoot over the 90-year-old **South Belridge** field in Kern County, Calif. The program is scheduled for completion at the end of first quarter 2007.

Global is implementing the survey over the Aera Energy LLC (Aera)-operated field using the Sercel 428XL acquisition system. The company already has attained a comfort level with the technology, having been the contractor responsible for the first US deployment of this particular Sercel system in a recently completed project in South Texas.

But South Belridge is a whole different breed of cat when it comes to seismic data acquisition.

Despite its maturity, it's still a highly active field, meaning the acquisition system must be able to surmount excessive

oilfield noise and infrastructure that can wreak havoc during a seismic survey.

Not to worry on the Belridge job, according to the experts.

"One of the things we wanted to do with the 428XL was to increase the data rates down the main transverse line which brings all the data back to the recorder," said Mark Farine, Sercel's vice president of sales and marketing for North and South America. "The recorder is able to control 100,000 channels, which has a huge impact on affording the contractors the ability to operate very large-channel crew counts."

Its impact on the Belridge shoot is also huge.

"The new Sercel 428 allows us to transmit at least five times the amount of data down a cable into the recorder than we could with previous recording systems," said Kirk Girouard, vice president western hemisphere at Global.

"This expanded capacity of the 428 lets us simplify our cable paths back into the recorder."

"We no longer have to pick off sec-



Figure 1. Global's Belridge crew operating 13,500 channels of Sercel 428XL equipment. (All photos courtesy of Global Geophysical)

tions of the data spread and bring those in separately to the recorder on separate cables and plug all those into the recorder," Girouard said. "With this system, we can move all the data on one cable to the recorder.

He added that the system reduces the complexity of trying to get data back to the recording truck in the high density, complex oilfield infrastructure. "Being able to send large quantities of data down simple minimal cable paths is really a god-send for this project," he said.



Figure 2. Global owns the largest and newest fleet of 62,000-lb I/O AHV IV vibrators.

The Sercel 428XL is a wireline digital telemetry system, another distinct advantage because the data are transmitted back to the recorder by wireline through the cable. A radio system would have issues being in the middle of a field with so much radio and microwave traffic already cluttering the airwaves.

Even though South Belridge is a longtime producing field, it has never before been covered by 3-D seismic with the exception of a small segment at the southern end, according to Gary Myers, geophysicist at Aera, who is the company's project manager for this survey effort.

Besides imaging the deep exploration reservoirs for the first time, a higher source and receiver density survey will be embedded within the broader and larger base exploration survey. This is designed to image much shallower producing zones at South Belridge.

Aera is recording into a template of more than 6,000 live channels, according to Myers.

"We have a big recording template because we have a structurally complex and deep objective (for the base explo-

ration survey) plus the much higher receiver density embedded over the core of the field," he said. "We need a lot more channels to record into, and that's why we went with the 428 system."

Myers noted there are approximately 13,500 channels on the crew even though they're not recording that many live channels at any one time.

"Because of the size and way this survey is being acquired, we need that many channels on the crew to be able to roll the spread effectively and lay it out from one end of the survey to the other," he said. "This is a huge, high-effort survey even by today's standards, and there's a massive amount of equipment on the job."

Meanwhile, a Global crew is revving up at the BP-operated **Wamsutter** gas field in Wyoming, where it will implement the initial field trial of Input/Output's (I/O) cableless land acquisition system known as FireFly. I/O is deploying 10,000 field station units at Wamsutter.

"This is actually 30,000 channels because it's three-component," said Tom Fleure, vice president of geophysical technology at Global. "It's a really

big spread."

The trial was set to get underway in November with only 10 to 12 days estimated for the actual acquisition phase, according to Craig Cooper, seismic project coordinator North America gas strategic performance unit at BP.

FireFly is designed to record full-wave data with greater sampling density than other land systems and to do so in a cost-effective manner.

"For us, in North America some of the most critical things we'll demand of our seismic are substantially improved spatial and vertical resolution," Cooper said, "and the ability to characterize tight reservoirs. We're focused around determining whether we can substantially improve what we get out of seismic acquired using this technology and the way it's deployed. We also want to demonstrate that a deployment such as this can be done with minimal or substantially less environmental impact."

Wyoming, like much of the land in the western United States, is a kind of environmental hot-bed, and Fleure noted the goal is to do a one-visit deployment.

"We want to drop a station once and only go back to pick it up," Fleure said.



Figure 3. Global's Crew 446 is managing the many challenges associated with operating within the dense infrastructure and actively producing oilfield environment of the South Belridge field.

“We’re essentially trying to go for zero environmental impact. To do that one-step process, the battery life is a key parameter. One way we’ll get the batteries to work a really long time is to turn the system on and off via radio.”

“To maximize battery life, we’ll use a lot of shooters who are the crewmembers that actually detonate the charges,” he added. “They’ll get prepared, turn the system on and then all shoot quickly. Then they’ll turn it off again to preserve the batteries.”

Cooper noted that data quality for the area is good and said his company is excited about testing out different ways of acquiring seismic data and using the FireFly system. He said also that BP has announced a substantial field development for Wamsutter and is hopeful that the results of the current seismic field trials will be encouraging enough to lend support for a field-wide re-shoot.

It is noteworthy that BP and I/O have worked closely together on the technical and commercial elements of the FireFly program since late last year, according to Jim Hollis, I/O’s vice president of new ventures – FireFly.

“This has been such a neat deal,” Hollis said. “It’s the first time we’ve been involved in having the oil company, the contractor and the manufacturer of the tools get in and tackle a problem like this. As an early adopter, BP can help shape what we build, support us and share the risk — and get what they want. This has been a refreshing change; instead of being driven solely from the technology group there, it’s the business unit because it’s solving business problems.”

The innovative approach doesn’t stop there.

Both BP and Apache stated early on that they are interested in capturing the benefits possible via FireFly technology. They were willing to put up capital to develop and deploy the technology but did not want to own the equipment. As a result, I/O introduced a seismic lease-rental technical services company called Seismic Equipment Solutions (SES). Via SES, BP and Apache basically pre-paid for a year of usage each, kind of like a time-share,



Figure 4. Global will implement the initial field trial of I/O’s FireFly, deploying 10,000 field station units at the BP-operated **Wamsutter** gas field.

according to Hollis.

“That gave us the capital to go out and build it,” Hollis said. “This works well for SES as they’re acquiring an expensive system with very little impact on their working capital. Even more exciting is that BP and Apache are working with our engineers building exactly what they need — everyone wins with an approach like this.”

In fact, Apache is gearing up to use the system once the Wamsutter action is a wrap.

“We haven’t made a final decision on where the first survey will be, but we’re getting close,” said Mike Bahorich, executive vice president of exploration and production technology at Apache. “I do know the project will be in North America.”

Another land system garnering attention these days is Ascend Geo’s Ultra, which is a cable-free continuous system. Its new G-5 platform will run in excess of 150 hours continuous recording run time, according to Bob Mulverhill, president of Ascend Geo.

He’s sold on cable-free technology as the way to go.

“One of the great technical advantages of being a cable-free system is portability and adaptability to the most extreme and broad range of environments,” Mulverhill said. “One of the initial field trials with Ultra took place in Belize late in 2004 where it performed successfully in open rolling hill environments as well as the rainforest.”

It is noteworthy that the first successful oil discovery in the country occurred in mid-2005 as a result of data acquired using the original Ultra system, according to Mulverhill.

In mid-2006, Ascend Geo partnered with Global to acquire both 2-D and 3-D data in Belize. The program has an exploration objective in a fairly new play, according to Fleure.

“One thing that makes the project interesting is it’s a combined, cooperative effort,” Fleure said. “Belize Natural Energy is the general contractor, and they’re sub-contracting with Ascend. Ascend and Global are both providing the manpower to implement the project — you have an oil company and two technical providers working together to meet the solution.” **ENR**