

# FireFly Takes the Field

I/O announces field test partners and gets ready to test FireFly's wings.

At last year's Society of Exploration Geophysicists (SEG) meeting in Houston, I/O announced its FireFly cableless land acquisition system. At the time, I/O President and Chief Executive Officer Bob Peebler described FireFly as, "an ecosystem in which multiple technologies interact in an entirely new way."

In November, the launch was long on vision and short on detail. A year later, the details have begun to more clearly emerge.

Early this year, I/O revealed its two oil and gas company launch partners. In March, BP committed to a 10,000-station FireFly field trial at its **Wamsutter** gas field in Wyoming. Bob Button, Wamsutter performance unit leader, commented on the agreement with I/O, stating, "BP is excited about the opportunity to test this novel seismic acquisition technology because it potentially provides a way for us to significantly improve resolution and characterization of target reservoirs while minimizing impact on the environment and mitigating risks associated with seismic field operations."

I/O is completing the assembly of the final FireFly field station units and expects to have all 10,000 deployed at Wamsutter later this month so Global Geophysical, the contractor selected by BP, can begin acquiring data. Jim Hollis, I/O's vice president of new ventures—FireFly, commented, "We have been working closely with BP since late last year on the technical and commercial elements of the FireFly program. They have contributed significantly to the product development effort, helping us identify the features that would most positively impact their imaging programs at Wamsutter and at other strategic assets worldwide. Their input on hardware, software and field operations has proven invaluable. But we are most excited about the collaboration between our GXT subsidiary and BP in the area of offset vector tiling

(OVT). This processing technique really stands to capitalize on the high sampling densities that FireFly makes possible."

Conventional seismic processing generally groups traces from different source-receiver pairs that share a midpoint into a gather that is stacked. In this process, the effects of different source-receiver offsets and azimuths are mixed, often to the detriment of image quality and contributing to the loss of valuable information about changes in seismic attributes that may relate to reservoir properties like fracturing. The OVT methodology, strongly advocated by the SEG acquisition instructor Gijs Vermeer, works differently. OVT-sorted data groups like offsets and azimuths, thereby optimally preserving offset and azimuth integrity. The denser the orthogonal surface sampling, the better the OVT technique works. Conventional wide-azimuth acquisition does not provide sampling densities that are high enough to sort in the OVT domain. However, FireFly supports high sampling densities that make OVT possible. At Wamsutter, for example, BP believes it will capture 1,000-fold data in offset vector tiles and also be able to populate cross-spreads for noise removal, compensate for anisotropy using prestack time migration and preserve reliable offset-azimuth attributes for reservoir characterization.

In May, Apache signed on as the second FireFly launch partner.

"Since Apache announced our full-wave technology acceleration alliance with I/O in 2003, we have been using full-wave technology on several strategic assets around the world. FireFly is a natural progression to obtaining higher resolution seismic images since the system supports the cost-effective recording of full-wave data with far greater sampling density than other land seismic technologies," said Mike Bahorich, executive vice president of

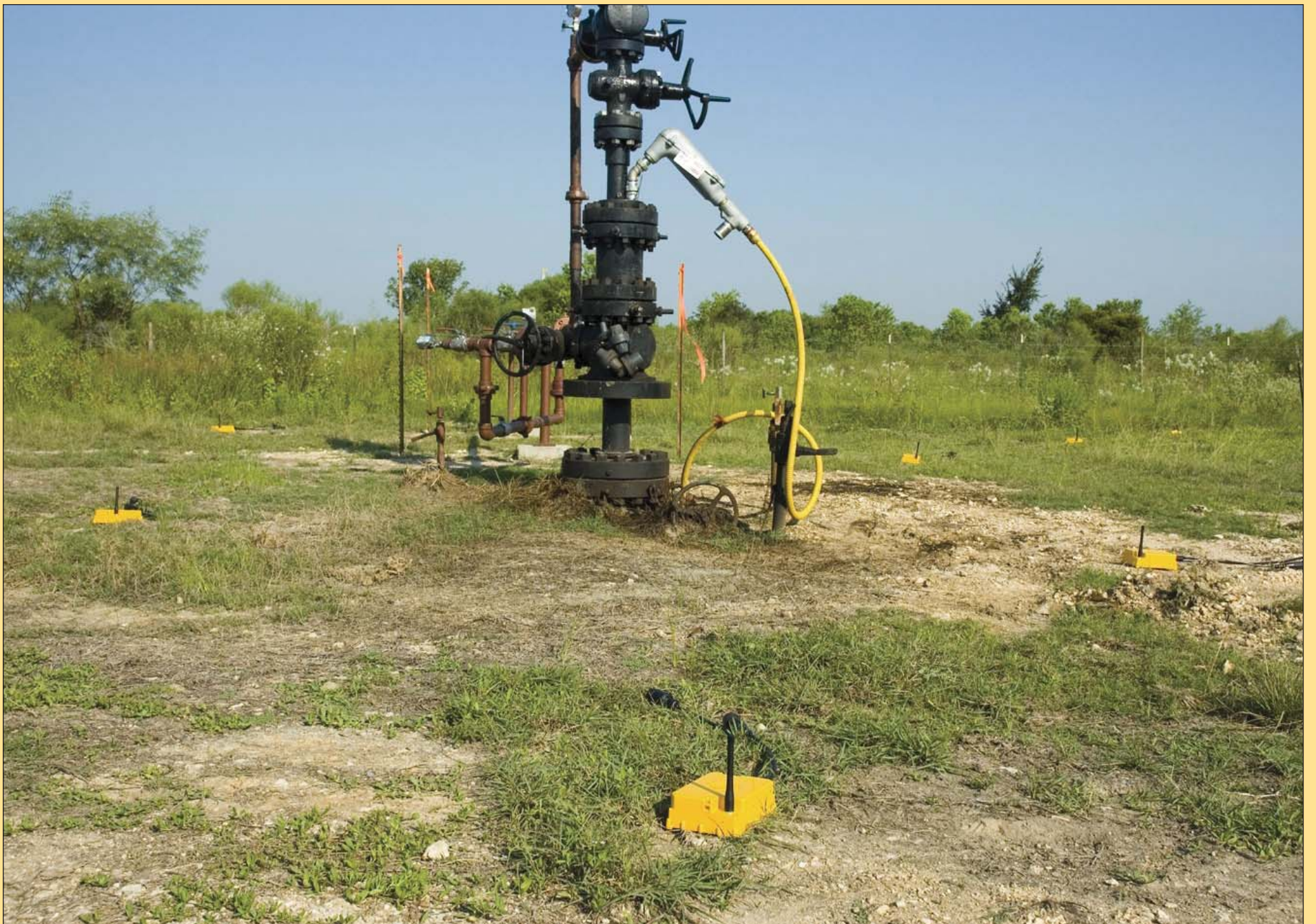
E&P technology.

Once BP's Wamsutter acquisition program is completed by year's end, Apache will receive the system and begin acquiring full-wave data.

Hollis, reflecting on the commercial structure that makes these multi-company field trials possible, stated, "Both BP and Apache wanted to capture the image quality; productivity; and healthy, safety and environment benefits that FireFly makes possible. Both were willing to sign up to long-term acquisition programs, and both were willing to put significant capital at risk to develop and deploy the technology. Neither, however, wanted to own the seismic acquisition equipment. As a result, we introduced an incumbent seismic lease-rental technical service company, Seismic Equipment Solutions (SES), into the equation. Apache and BP both flowed capital into SES as pre-payments on long-term, multi-period rental agreements for access to the FireFly technology. Concurrently, SES took these pre-payments, along with \$5 million of its own capital, and used the proceeds to purchase the 10,000-station FireFly system from I/O. As a result, everyone achieved his or her commercial objectives.

"Perhaps most exciting for the industry is the fact that there are several multi-month blocks of time in which neither Apache nor BP have any call on the FireFly equipment. In these windows, SES is free to rent the FireFly technology to other interested oil and gas companies or acquisition contractors."

In terms of what's next, I/O clearly isn't satisfied with all that has been accomplished thus far. Hollis eagerly rattles off the priorities on the FireFly agenda—delivering on the expectations of BP and Apache; capturing the potential operational and imaging improvements that FireFly makes possible; and expanding the reach of FireFly to additional regions, imaging environments and customers. ■



Firefly units await recording in Wyoming's Wamsutter field. (Photo courtesy of I/O)