



Unlocking the Unconventional

FireFly field applications demonstrate the potential to transform geophysics in challenging onshore environments

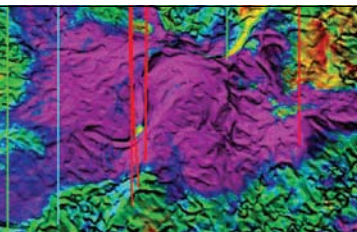
■ As we wrapped up 2006, our first FireFly system was being deployed in the high desert of Wyoming on its first field application by BP. This marked a significant milestone in our fast-track development effort to move from concept to field deployment in less than two years. As you may know, FireFly is our revolutionary system for high-density land seismic acquisition without cables. The field projects by BP and later Apache validated the potential for FireFly and, importantly, showed us how to refine and improve the system. Perhaps Craig Cooper, BP's Land Seismic Coordinator for North America, said it best shortly after the Wamsutter acquisition concluded: "The flashes of brilliance we saw at Wamsutter make it exciting to think about how to more tightly integrate FireFly into our field development plans. [The system] will give us more information and a better chance of characterizing our reservoirs. We have an opportunity to use this technology to fundamentally change the way we perform."

■ The Wamsutter field project tested the limits of our first system. The high desert of Wyoming normally sees only a few inches of snow each winter, but BP encountered several feet from late

2006 through early 2007. The snow and extreme cold provided some challenges to both equipment and BP's field personnel, yet nearly 7,000 shot points of full-wave seismic data were ultimately recorded using more than 8,000 FireFly units.


■ From Wamsutter, the FireFly system moved to East Texas with Apache for the second field application. Instead of record snows, Apache faced record rainfall. The cold of Wyoming was replaced with the heat and humidity that makes Texas infamous. Apache was working with a second acquisition contractor that faced a tough environment in terms of terrain (flooded areas, dense foliage) and culture (farms). Again, Apache pushed the limits of both equipment and personnel, but still recorded more than 4,300 shot points. Both the BP and Apache datasets have been processed by our GXT Imaging Solutions group. The results appear promising and are now in the hands of interpreters who are using the insights to tune their reservoir development plans.

■ In the end, the environmental extremes and large-scale deployments tested FireFly in ways we couldn't have simulated in the lab. These insights,



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Craig Cooper, BP's Land Seismic Coordinator for North America



however, should accelerate our further commercialization of the system. So what did we learn? For one thing, our data communications backbone wasn't yet perfected, which affected the overall reliability of the system and the productivity of field operations. We also discovered that our power management system needed some improvement. Neither of these learnings was unexpected, as the FireFly architecture removes the cables that normally serve as the communications and power networks within a traditional seismic system.

■ During 2007, we've been working hard to enhance the communications and power backbones that underpin the FireFly ecosystem. We believe we now have an approach that will deliver significantly more reliability and operational efficiencies than our original design. We're expecting these updates, along

with several other refinements, to be complete in mid-2008 when we deliver our second version of the system. We believe that these hardware and software enhancements, along with the advancements we have made in full-wave processing, attribute analysis, and data management from other projects, should ultimately provide us with an end-to-end solution that is capable of transforming land seismic around the world.

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