FEBRUARY 2015

BUSINESS IN focus

businessinfocusmagazine.com

COMMITTED TO QUALITY AND SELECTION
Fastenal

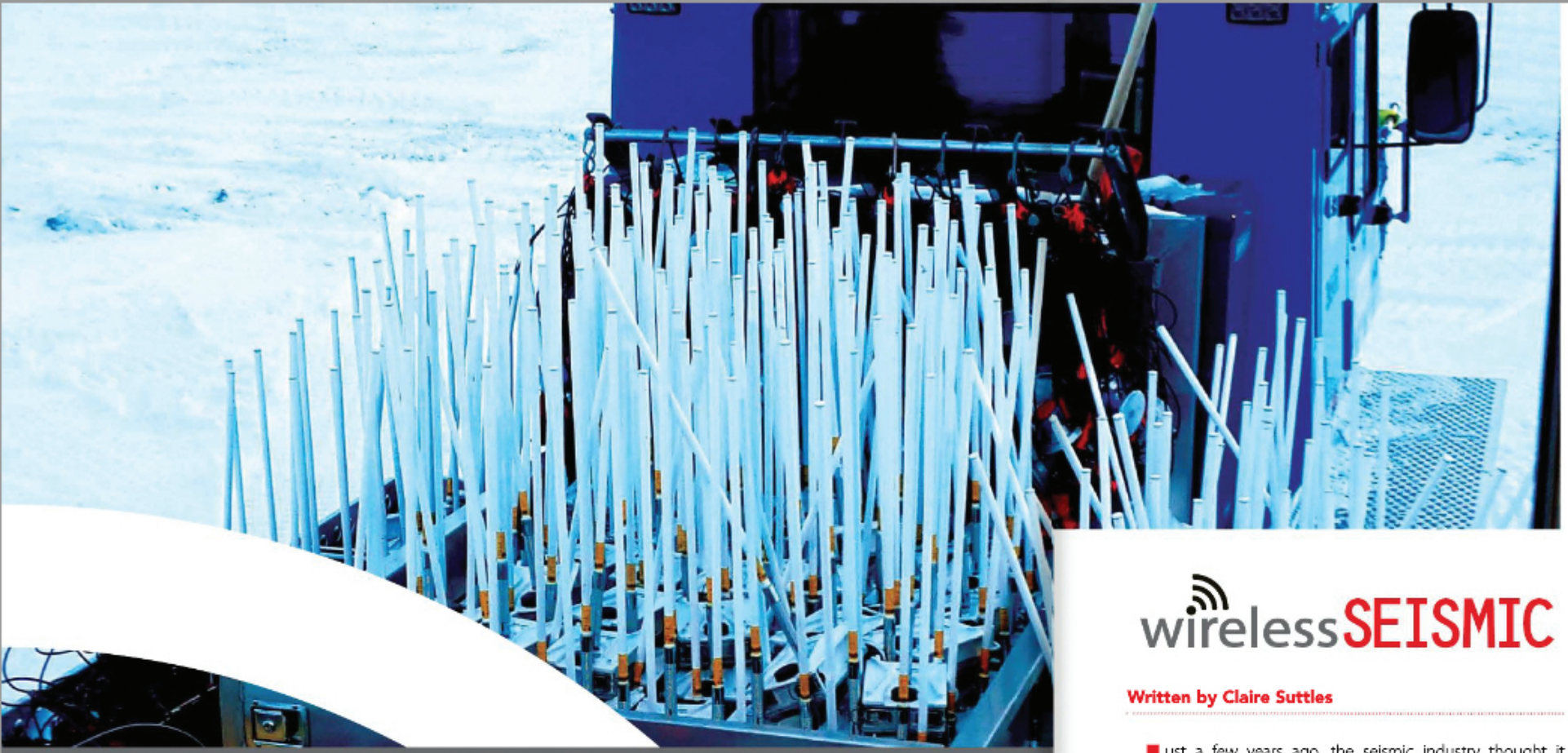
GLOBAL EXPERTISE, LOCAL DELIVERY
The Bouchier Group

THE GRASS IS GREENER
City of Green Bay, Wisconsin

A MATTER OF DOLLAR$ AND SENSE

The Business of Geothermal Heating and Cooling

A focus MEDIA GROUP PUBLICATION



Wireless Seismic is on the cusp of revolutionizing an industry. The Texas-based company has developed an ingenious system capable of transmitting important seismic data via thousands of radio transmissions, rather than through traditional cables.

Revolutionizing AN INDUSTRY

wirelessSEISMIC

Written by Claire Suttles

Just a few years ago, the seismic industry thought it couldn't be done. Wireless Seismic has proven them all wrong.

Seismic data is the primary method used by the oil and gas industry to identify subsurface oil and gas traps. The company's groundbreaking system is used to transmit the large amount of data, collected from thousands of seismic sensors laid in the ground in a grid pattern across a large geographic area, to a central recording location. A planned explosion or similar earthshaking event is initiated, sending vibrations deep within the earth. "Once in the subsurface, some of the seismic energy will transmit ever deeper and some of the energy will reflect back to the surface," explains President and CEO, Mick Lambert. "This reflected energy is recorded at the surface, very much like earthquake recorders, and then the data is collected into a central database and processed into 2D or 3D images of the earth's subsurface." These high-tech images give oil companies a structural picture of what lies miles beneath the surface, giving them a good idea of where to drill.

The seismic technique is not new. In fact, seismic exploration has a history stretching back almost to the turn of the 20th century. "Over the last six or seven decades, the method used to get the data back from all these sensors to a central database has been via copper-based cables, and that approach has worked extremely well over the years," Lambert recalls. "But now the trend in the industry is for more and more of these sensors, with closer spacing over larger and larger areas. Forty years ago, a big survey would have been a couple of hundred sensors, and now a big survey can be as large as a hundred thousand sensors. It's gone from dozens to hundreds to thousands to tens of thousands."

This upscaling has made it far more challenging for the industry to use cables. With so much ground to cover, cables must be run over a far greater distance, requiring more vehicles and increased manpower, and causing more damage to the surrounding environment. The cables themselves are also more likely to be damaged, particularly when they have to stretch across roads. "You will spend a lot of time repairing cables," Lambert points out. "The cables are also very heavy and require heavier trucks to transport them. Permitting becomes an issue because most landowners don't want large vehicles on their property tearing up their crops to lay out these cables, and so it has become a big logistical challenge."

"We are the only ones that offer a wireless radio system that will scale to more than a few hundred channels."

Not surprisingly, a number of companies have worked to find a better solution over the years. "One of the goals of the industry for quite some time has been to find a way to record all this data without having to transmit it via cables," Lambert explains. The industry's first fully scalable, cable-free architecture has been broadly deployed over the last 5+ years – but, it has introduced new operating limitations cabled systems did not have. This architecture replaces traditional cables with autonomous nodes which record the data locally, at the sensor, rather than sending it to a central location. "The advantage with autonomous nodes is there are no cables. The disadvantage is all of your data are spread over tens of square miles and you have to periodically go and retrieve the data manually. In short, the autonomous node solution simply replaces one drawback with several others. Having to manually collect the data is in itself a big problem," Lambert explains.

A second alternative to cables is to transmit data back to a central location via radios. This architecture is win-win. "You are cable free and you don't have to manually collect the data," Lambert says. "It has been the dream of the land-based seismic industry for quite a while." But, taking the concept from dream to reality was long considered a pipe dream. "There have been huge challenges," Lambert admits. The radio technology wasn't there, the power consumption of the radios was too high, and the battery life was too short. This combination made the concept woefully inefficient. "You could build a radio system that could maybe handle 200 or 300 channels or sensors, but you had to change the batteries every day," explains Lambert. "And when you tried to go to 1,000 or 2,000 channels, the radio frequencies interfered with each other and the whole network would grind to a halt."

"The high tech image gives oil companies a structural picture of what lies miles beneath the surface."

Remarkably, Wireless Seismic has managed to overcome all of these challenges. "Our company has actually cracked the problem," Lambert shares. The company's new system is capable of operating with many thousands of channels with a battery life that lasts from 20 to 50 days, depending on the length of the workday. As a result, seismic data can be streamed instantly from every sensor to a central location for immediate, real-time analysis. Cables are completely eliminated and no one has to go out and manually collect the data.

"It has been a very lengthy development effort," Lambert says of the process. "It was an extremely complicated problem. Many companies have tried and failed – mostly because they tried too early and the underlying technology really wasn't available, yet." Even after the technology was available, no other team has been able to figure out how to make it all work. "The system is a combination of lots of different technologies – high-performance radios, signal processing algorithms, low-power microprocessors, advanced battery technologies, etc. – you have to bring all these technologies together and blend them into an integrated system. We managed to accomplish that goal," states Lambert.

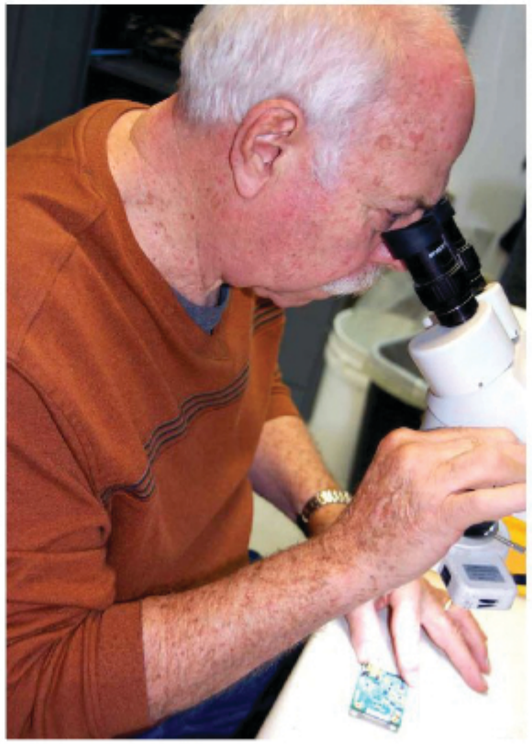
Wireless Seismic's groundbreaking real-time and cable-free seismic data acquisition system, the RT System 2, is set to revolutionize the industry. "We are the only company that has been able to build a cost-effective system that will scale to more than a few hundred channels", added Lambert. "Our offering is unique in the marketplace."

Now that the technical problems have been solved, Wireless Seismic's remaining challenge is getting the word out. "We have proven that our solution works, and now we are trying to achieve increased market traction to a skeptical industry that has seen very little success of radio systems in the past. Some companies are still feeling burned by subpar solutions that hit the market before the technology was good enough to do the job right. They bought one in 1963 and it didn't work well, so they say they will never buy another one," Lambert laughs. "We have had to overcome that."

The proof is in the pudding, as they say, and the success rate that Wireless Seismic's solution has had in the field is helping to win over a skeptical industry. "For the last two years, we have had systems deployed that have been in the 5,000 to 15,000 channel range," shares Lambert. "Our clients have run projects in the Middle East very successfully with large channel counts, so now we are seeing some of the more skeptical customers starting to see the benefits of our technology. As companies replace their cable systems, we are going to be a very reliable and cost-effective alternative to the autonomous node systems. People are starting to recognize that using fewer people, fewer vehicles, getting your permits quicker and getting your data immediately is a significant advantage."


Mick Lambert
President and CEO

"Forty years ago a big survey would have been a couple of hundred sensors, and now a big survey is a hundred thousand sensors."



And this is only the beginning. The next step is to develop a solution that can operate across tens of thousands of channels. "We are not ready yet for 100,000 channel deployments," Lambert says of the company's current radio system. "Cables will dominate the very large mega crews for probably another two to four years. But as our technologies mature, I think even at the mega crew level, the cables will eventually be displaced."

Wireless Seismic will be there to make sure it happens. "We will make a big push to compete in the mega channel crews a little bit farther down the road. Right now, we are focused on 15,000+ channel systems, although a 100,000 channel radio system is not too far out." The team is optimistic that it is only a matter of time before they master these incremental challenges, which would give them a significant leg up across all seismic exploration projects, regardless of size. "Our goal is world domination," Lambert laughs. With so much trailblazing already accomplished, his joke might just prove true. ■