

Sonic Drilling Ltd.

Sonic drilling technology soars to new heights thanks to innovation of engineer

By Heather Hudson



2011 Sonic 390 Model Drill rig.

He didn't invent it. He wasn't the first to develop it. But mechanical engineer Ray Roussy is the last man standing with the tenacity to carry on the work of sonic drilling pioneers that began a century ago.

What began as one of the first projects of his career back in the early 1970s has become Roussy's life work—one that he is loath to ever give up.

"I'm 64 now so I'll have to come to the realization that I can't do this forever... but I don't plan to retire; I'll work until I drop."

The sonic drilling technology he has spent 30 years developing is getting attention as a reliable drilling method all over the world. Its non-intrusive nature means it's in high demand for sensitive projects like dam and hazardous waste site remediations, as well as nuclear site investigations.

After tinkering with the technology and amassing a number of patents over the last 30 years, Roussy has also been building up a couple of businesses based on sonic drilling. Sonic Drilling Ltd. is a Vancouver, BC-area contracting company featuring a number of rigs outfitted with the "Roussy sonic drill head" used in environmental investigations, mining exploration and geothermal drilling projects.

Sonic Drill Corporation is a manufacturing business that produces a product line of drilling rigs using the world's most advanced and tested sonic drill heads. He has also licensed the technology to a Japanese company, which develops machinery for construction use in that country.

All this because of the single-minded drive to see one of the first engineering projects he ever worked on through to a successful end.

"I was a young engineer looking for something exciting to work on for my career and this thing kind of fit the bill. (Sonic drilling) was interesting machinery and had potential but also lots of problems. It was a very challenging field to be in and that's kind of what I was looking for as an engineer," he said.

Though it's gaining in popularity today, sonic drilling technology had humble beginnings. Its roots can be traced back to the efforts of George Constantinesco, a Romanian intellectual who created a prototype of a rock drill working on a percussion system. Unlike pneumatic drills, Constantinesco's vibratory prototypes



Ray Roussy.

were capable of boring through hard granite rock quietly and smoothly.

By the 1940s, the technology came to the US for use in the oil industry and continued to be developed by Drilling Research Inc. and then American inventor Albert Bodine (funded by Shell Oil). Most of his efforts were directed at large vibratory pile driving machines, although his organization eventually developed

a smaller vibrator for seismic shot-hole drilling.

In the early 1970s, Bodine sold his drilling and pile driving equipment to Hawker Siddeley, a British aircraft manufacturer with Canadian offices. Young engineer Roussy was working in one of them in Thunder Bay, Ont. He was assigned to the design team focused on the pile driving equipment and which later concentrated



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on adapting the vibratory shot-hole driver to general shallow earth drilling.

Despite the engineers' best efforts, rigs produced by Hawker Siddeley using early sonic technology experienced frequent breakdowns and lacked appropriate tooling to withstand the associated vibratory forces. When the recession hit in the 1980s, Hawker Siddeley left off developing work in this field.

But Roussy couldn't let it go. He left the company to keep working on the sonic drill head and adapt it to different applications.

"I saw a real need for it," he explained. "Part of my role was to try these out with different applications and I could see there was good market potential for this machinery. Hawker Siddeley was a big company – they were looking for equipment they could mass-produce, so there wasn't a whole lot of interest in this machine. But for a smaller type of manufacturing company I could see there was potential."

Having just made a difficult transition from his Ontario home to the overcast climate of Vancouver, Roussy was inspired to take yet another risk and start all over again. This time he would follow his own instincts and strike out on his own.

But things didn't launch as quickly as he would have liked.

"It took forever for Sonic Drill to take off. The big problem was getting financing. I was faced with, 'If a company like

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– Ray Roussy, owner, Sonic Drilling Ltd.

Hawker Siddeley can't make this technology work, what makes you think you can do it?"

While he was working to get financing to get his business off the ground, he found financial salvation servicing and upgrading the original Hawker Siddeley drill heads to make them more reliable and constructing a number of similar sonic drill heads.

Eventually, Roussy built a sonic drill head and drill rig for himself and formed Sonic Drilling Ltd.

"The big market was environmental drilling and the phone started ringing off the wall. Revenue from that contracting division allowed further development to get it to the point that it was a reliable machine and then we got to sell machines to manufacturing companies all over the world."

With his patented technology, Roussy can claim credit for not only improving on the efforts of those who went before him but of finally bringing a highly-sophisticated sonic drill to market.

And others are noticing. In 2010, he won a coveted Innovation Award from the Ernest C. Manning Awards Foundation for developing one of the fastest drilling systems in the world. The Canadian GeoExchange Coalition also awarded Sonic Drilling



Ray Roussy on the jobsite.

Corporation winner of the 'best new drilling technology' in 2008.

"My main role is as someone who commercialized technology. I didn't create it, but it certainly wasn't in very good condition when I started in on it and we've gotten to the point where we've got quite reliable machines."

Today, the sonic drill head can drill three to five times faster than any other on the market without the use of drilling mud and with up to 80 per cent less waste. Sonic drills can also provide continuous undisturbed core samples to a depth of 300 feet.

While there are unlimited applications for this technology, the top three uses for a sonic drill rig are geo-thermal installations, environmental investigations and mineral exploration. Award-winning sonic drill rigs, patented and built by the Sonic Drill Corporation, have worked on thousands of drilling projects around the world.

Roussy says it's now being regarded as yet another tool in the construction and piling industries. "The advantages are noise and vibration reduction and that's where technology will go in that arena."

Instead of wood piles pounded into the ground, he says drilling a hole, casing it and forming a concrete pile is just as effective and faster. In England, they're experimenting with putting a heat exchanger inside the pile for a dual function support and geo-thermal system.

When he looks back on a long career that has evolved every step of the way, Roussy says he's content with the legacy he will eventually leave behind.

"My role has been to make this a workable technology and I've done that quite well. When I look back at this when I do retire in 10 or 15 years I'll know I've developed the technology and it's here to stay." 

For more information about sonic drilling, visit www.sonicdrilling.com.