Industrial Research Assistance Program (IRAP)

Region:
British Columbia and Yukon
Sydney

ASL Environmental Sciences Inc.

"Having access to development support really does make a difference."
David Fissel, PDG, ASL Environmental Sciences Inc.

Better meter boosts electricity production

ASL Environmental Sciences Inc. has been involved with acoustic scintillation technology for over 15 years, but it was only recently that it saw a commercial opportunity for a brand new product for the hydroelectric industry. The Acoustic Scintillation Flow Meter (ASFM) is a patented device that helps hydroelectric plants take more accurate measurements of the water flow in turbines. This data is increasingly sought to increase operational efficiency, and conserve shrinking water resources.

ASL Environmental Sciences provides scientific consulting services and instrumentation for oceanography, underwater acoustics and ice research which help its clients operate in extreme conditions. In the 1980's, the Sydney, B.C., company worked with Canadian and U.S. government scientists to develop acoustic scintillation technology for ocean applications, some of it with National Research Council (NRC) support. Several customized versions were successfully operated in major waterways.

In 1997, the NRC's Industrial Research Assistance Program (IRAP) supported market research that confirmed a huge market for ASFM technology in low head hydroelectric plants -- US$50 million in North America alone. With those results, ASL Environmental Services licensed the technology and created ASL AQFlow Inc in 2000. It immediately embarked on an two-year NRC Pre-commercialization Assistance program. "That allowed us to do a lot of R and D that was necessary to get from the original idea to a final product," says David Fissel, ASL AQFlow's President and CEO.

The IRAP initiative is a key component of a countrywide innovation system linking a diverse network of institutions, organizations, and programs to help small

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and medium-sized enterprises (SMEs) develop and exploit technology in a competitive, knowledge-based economy. The National Research Council is the federal government agency that supports scientific research, development and innovation in every region of Canada.

ASFM technology is based on acoustic scintillation drift, a technique that measures flow in a turbulent medium by analyzing variations in ultrasonic sound impulses sent through the medium. It can measure the magnitude and velocity of water flow in hydroelectric plants to within one to two percent accuracy, a competitive -- and environmental -- advantage over other technologies which are only accurate to about five percent.

"It doesn't sound like much, but by using the equipment over a year a plant can recoup the costs of purchase and make significant gains in energy sales," Fissel says. Improved water flow measurement allows turbine blades and equipment to be modified to provide the greatest power output for a given amount of water. Or, if a certain amount of power is required, the plant can maintain water flow at optimal levels.

NRC-IRAP Industrial Technology Advisor Vern Rogers oversaw a technology and financial review in the early stages, and brought in NRC expertise from other areas as the project progressed. "It was a team approach and we got a lot of quite useful feedback, even in terms of our business objectives," Fissel says. Under the PA project, the company carried out more definitive tests and evaluation of the technology, and extensive numerical modelling of plant operations.

Several ASFM systems have already been sold through development partnerships with companies such as Hydro Quebec and Nova Scotia Power. The program concludes in March 2003 and ASL AQFlow expects to release its first product shortly after. The ASFM Advantage is a meter designed for temporary use. It's an easy-to-operate system with simple, user-friendly displays and reporting features. A stand alone system for permanent installation in the turbine intake, ASFM Monitor, is still under development. Two other products for spillways and circular penstocks are also in progress.

Fissel says the NRC has been a key ingredient in the company's expansion and growth. "Having access to development support really does make a difference," Fissel says. ASL AQFlow currently has six staff but is poised to grow to 35 employees within three years, Fissel says. Increased sales will create significant spin-off benefits for local suppliers, especially in machining, fabrication and electronics businesses. ■

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