

## **Hot Hot Topics – September 2003**

### **CIDRA Corporation Develops New Sonar Flow Technology**

It isn't very often that a new type of flowmeter comes along. CiDRA Corporation of Wallingford, Connecticut is in the process of introducing a flowmeter that has all the earmarks of being a genuinely new flowmeter technology. The new meter is called the CiDRA SONARtrac™ flowmeter, and it uses array processing technology to generate a volumetric flowrate in closed pipes.

CiDRA was founded in 1997 as a company that combined industrial and optical skills to deliver real time process monitoring to the downhole oil & gas market. The downhole oil & gas business unit was sold to Weatherford in November 2001. CiDRA's target markets include industrial process control systems and scientific, laboratory, and manufacturing instruments. The company has 135 employees.

CiDRA's SONARtrac™ flowmeter works by taking advantage of naturally occurring vortex-like disturbances that occur in turbulent pipe flows. Clamp-on strain based sensors embedded in the sensor portion of the flowmeter sense the pressure created by these vortices on the pipe wall. The array processing technology comes in because these vortices occur in coherent series, somewhat like the cars in a train. By analyzing the output from the SONARtrac sensor array, the flowmeter derives the volumetric flowrate. At its core, the method is similar to the way in which a ship uses sonar technology to determine the speed and direction of an approaching object, by interpreting the underwater sound field.

One of the most appealing features of this new flowmeter is it mounts on the outside of the pipe. While this clamp-on feature is similar to an ultrasonic meter, the sonar meter works on fundamentally different principles. SONARtrac meters use a series of ring-like sensors banded on to the outside of the pipe. Pressure sensors contained in the rings are

sensitive to the strain in the pipe wall caused by the turbulent vortices, and this is the data used to compute flowrate.

Some people may compare this flowmeter to an ultrasonic meter. However, it measures pressure waves at vastly lower frequencies than ultrasonic meters, and it does not send out a signal through the flow as ultrasonic meters do. It may also be compared to a vortex flowmeter, since it analyzes trains of vortex-like disturbances in the flow to determine flowrate. However, unlike a vortex meter, SONARtrac does not require inserting anything into the flowstream to generate these vortices; instead, it relies on vortices that naturally occur in turbulent flow.

CiDRA currently has Beta site installations at a number of industrial process plants, including pulp & paper and chemical. Quoted accuracies are in the 0.5% range, although these have yet to be verified by independent testing labs. CiDRA projects that commercial units will be available in the second half of 2003.

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