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Three Rivers, Michigan, USA

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Veris, turns to Schneider Electric to Help Meet Demanding Customer Flow Measurement Requirements

“We were so confident it would meet our customer’s stringent requirements that Veris and Schneider Electric jointly took performance responsibility and gave the customer a five-year performance warranty. This is unheard of in this industry, but, until now so was obtaining accurate flow measurement in the operating ranges we have here.”

- Jerry Gallo, National Sales Manager

Niwot, Colorado — Veris, Inc., now Armstrong International, was founded in 1987 with a mission to design, build and service value-engineered flow measurement instruments. Headquartered in Niwot, CO, Veris is ISO 9001 certified and manufactures and inventories more than 95% of the parts to assemble its primary product line, Verabar. The company’s latest innovation is the Accelabar Flow Meter, which combines Verabar technology with Foxboro differential pressure transmitters to produce operating ranges never before attainable in a single flow meter.

Goals

- Improve accurate flow readings for processes that have large swings from the low and high end of the measurement range

Challenges

- Measuring LNG flow measurement at the extremes of high and low flow rates throughout the year is difficult using standard flow measurement technologies

Solutions

- Foxboro IDP50 Premium Performance d/p Cell® Transmitter

Results

- Unprecedented flow measurement accuracy at extreme high and low flow rates (“turndown” ratios of 60:1)
- Improved accountability of gas usage and inventory
- Reduced equipment and maintenance costs in harsh environments
- Ready installation in pipeline with complex configuration

Demanding Flow Rates

The natural gas industry involves a complex network of production, distribution, and delivery to meet the growing global demand for more than 100 trillion cubic feet per year. Of the myriad procedures involved with supplying this natural resource, flow measurement is one critical constant. From producer to consumer, accurate flow measurement is the keystone for delivery and product accountability. However, a traditional challenge, which has enormous financial stakes, is accurate flow measurement at the extremes of both high and low flow rates.

A Veris customer in Minnesota faced this situation at their Liquid Natural Gas (LNG) storage facility. The company stores LNG in two 12,000,000 gallon tanks and uses gas-fired heaters to vaporize it as required to meet customer demand. For most of the year demand is low, however during the coldest winter months gas consumption jumps from 1,000 to 60,000 standard cubic feet per hour (SCFH), representing an enormous flow rate change (a “turndown” ratio of 60:1).

The plant had attempted to measure this flow rate with a turbine meter sized for the maximum flow rate, but could not get accurate flow readings at the low end of the measurement range. This makes it impossible to determine actual usage during the off-peak periods. In addition to accuracy limitations, turbine meters have moving parts, which wear and require expensive maintenance.

An option they considered was using a differential pressure (DP) transmitter with an orifice plate, a flow measurement method commonly used in the gas industry. But given the wide span of flow rates, a single meter could not accurately measure the high and low extremes. And use of multiple meters proved too costly with the required bypass manifold piping, valves, and complete monitoring electronics necessary to allow seamless changeover between meters.

Another option was to change the orifice plate sizes seasonally to measure widely changing flow rates. However, this approach involved intensive field labor in severe weather conditions for manual changing of the plates and rearranging of the transmitter.

Leading Edge Technology Solution

The solution was found in a flow meter developed by Veris, Inc., that incorporates Foxboro d/p Cell® transmitters. Named the Accelabar®, the new Veris meter features a Veris patented toroidal nozzle design with Verabar flow rate measurement technology. The nozzle provides a straight run “settling distance” that accelerates and stabilizes the velocity profile and significantly increases the DP captured by the Verabar located within the nozzle. The result is a very accurate and predictable DP over an exceptionally wide flow range.





Expectations Exceeded

The Veris Accelabar flowmeter with Foxboro IDP50 transmitters is installed in the LNG plant in a pipeline with no straight runs, with valves, strainers, and pipe expansions and reductions ahead of it. Even in this demanding configuration, the Accelabar flowmeter is meeting all performance requirements. The system provides flow rate measurement accuracy of $\pm 0.75\%$ over the entire 60:1 flow operating range and has actually exceeded expectations by accurately measuring flow rates with turndowns as high as 150:1 (from 60,000 SCFH all the way down to 400 SCFH).

“The system proved to be everything we wanted and more. We were so confident it would meet our customer’s stringent requirements that Veris and Schneider Electric jointly took performance responsibility and gave the customer a five-year performance warranty. This is unheard of in this industry, but, until now so was obtaining accurate flow measurement in the operating ranges we have here,” said Gallo.

Also, because both the Accelabar and the Foxboro IDP50s have no moving parts to wear or seize, maintenance is minimal. And, the natural gas supplier has found that the flow metering system is user-friendly and easy to operate, especially since DP flow measurement is one of the most easily understood of any technology available. To the LNG provider, this translates into improved material accountability and lower operating costs, both of which improve profitability.

The Foxboro® IDP50 Premium Performance d/p Cell was selected for this application. The IDP50 features improved characterization and compensation techniques to achieve industry-leading accuracy and resistance to environmental effects over a very wide measurement range. Two sensor selections are available within the IDP50 group, one with an upper range limit (URL) of 1000 inH₂O, and the other with a URL of 200 inH₂O. Both selections are accuracy-rated $\pm 0.025\%$ of span for spans as small as 1/10 of maximum span and no more than $\pm 0.05\%$ of span even for spans as small as 1/80 of maximum span.

Because of the exceptionally wide range of flow rates in this natural gas application, the engineers chose to use two high-accuracy IDP50 transmitters, one to measure DPs from 302.8 down to 2.5 inH₂O with $\pm 0.025\%$ of span accuracy, and the other to measure DPs from 2.5 down to 0.34 inH₂O (and ultimately even lower) with $\pm 0.050\%$ of span accuracy.

“When designing this system, we immediately turned to Schneider Electric for DP transmitter expertise. We’ve worked with Schneider Electric through the years and continue to be impressed with their level of technology and proven product performance. For this application we combined two leading edge technologies in one flowmeter to achieve operating ranges never before attainable,” said Jerry Gallo, National Sales Manager for Veris.

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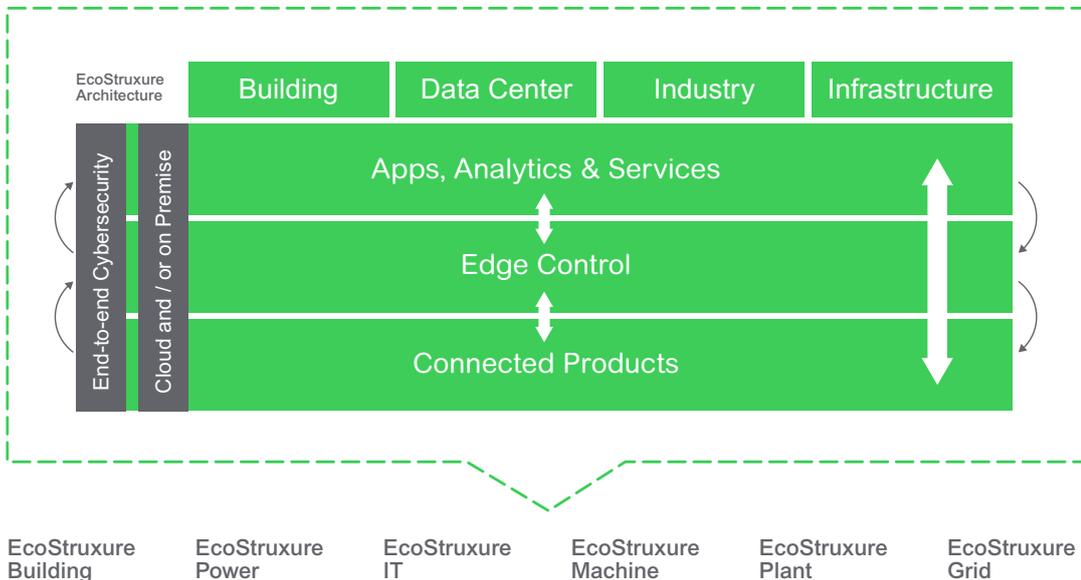
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EcoStruxure leverages advancements in IoT, mobility, sensing, cloud, analytics, and cybersecurity to deliver Innovation at Every Level including Connected Products, Edge Control, and Apps, Analytics & Services. EcoStruxure has been deployed in 450,000+ installations, with the support of 9,000 system integrators, connecting over 1 billion devices.

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