

# ASK THE EXPERT

A Redundant Flow Measurement Solution to Eliminate Unexpected Process Shutdowns, Increase Plant Safety and Reduce Installation Complexity



**ELLEN DEGNAN**

*Global Product Manager for  
Emerson Automation Solutions*

Safety and risk reduction are high priorities for operators in the process industry to protect personnel and their surrounding areas from harm while also mitigating damage. One layer of risk prevention is in the Safety Instrumented System used in critical processes. Emerson has a comprehensive offering for safety integrity level (SIL) Vortex Flow Meters and the Rosemount™ Quad Vortex Flow Meter provides a perfect balance between meeting safety requirements and reducing the need for unexpected and costly maintenance shutdowns. Vortex technology provides several operational advantages, especially in situations calling for multiple meters to be installed at the same measurement point, as with safety systems requiring redundant flow measurement. It comes standard with four independent sensors and transmitters, ensuring a safe and reliable solution for redundant flow measurement.

Ellen Degnan is a Global Product Manager at Emerson based in Eden Prairie, Minnesota. She is responsible for managing Emerson's Vortex Flow Meter portfolio globally, and has a Bachelor of Science degree in bioproducts and biosystems engineering from the University of Minnesota.

Below, Ellen answers some frequently asked questions about the Rosemount Quad Vortex Flow Meter and why Vortex flow meters are an ideal redundant solution.

## What are the customer advantages of a Rosemount Quad Vortex system?

**A:** Most importantly, it is a fully redundant solution in a compact design which eliminates the need for additional flow meters and additional straight run, which reduces installation costs. With no impulse lines and a unique all-welded design, leak points are eliminated, and operating expenses decrease significantly. The cost of a false trip can be very expensive in terms of lost production and the cost of restarting the process. The Rosemount Quad Vortex delivers a 2oo3 voting scheme, which keeps the process running until at least two out of the three transmitters respond to a trip simultaneously.

## When it comes to safety, what sets the Rosemount Quad Vortex apart?

**A:** Emerson's Rosemount Quad Vortex Flow Meter is certified for safety instrumented functions (SIFs) capable up to SIL 3. It is commonly used in Safety Instrumented System (SIS) loop applications, where equipment must meet the highest reliability standards while minimizing and/or eliminating unscheduled shutdowns. During the instrumentation decision process, the requirements document typically states what SIL level the product must meet. The Rosemount Quad Vortex was designed to meet reliability specifications while also providing a fully redundant solution to meet certification levels.

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### What industries or applications has the Rosemount Quad Vortex been installed in?

**A:** We are seeing the Rosemount Quad Vortex installed in several different industries, from chemical and refining to power and offshore oil and gas. In steam measurement where safety is critical and a reliable mass and energy balance is needed, the Rosemount Quad Vortex is utilized for its accuracy and dependability. The Rosemount Quad Vortex has been installed in numerous applications — hydrofluoric alkylation units, delayed coker heaters, feedwater flow in power plants and reformers in chemical plants, just to name a few.

### How is the Rosemount Quad Vortex calibrated?

**A:** The calibration process happens in a flow lab and the Rosemount Quad Vortex is calibrated using all four transmitters at once. Each transmitter and sensor combination must pass the calibration specification in each specified flow rate. If any of the transmitters fail, the whole assembly fails calibration and needs to be re-ran. All four transmitter/sensor combinations need to pass on the same calibration run.

### Do the vortices of the first shedder bar impact the second shedder bar or impact the total accuracy?

**A:** We know that obstructions downstream from the shedder bar can cause disruptions in the formations of vortices which can impact accuracy. Emerson's patented spacing between the two shedder bars has been engineered and fully tested in the flow lab to eliminate any interference and actually uses the second shedder bar as a reinforcement of the first.

### Are diagnostics available and how are they accessed?

**A:** For simplified troubleshooting, device diagnostics allow for verification in the field of the flow meter's electronics and sensor without process shutdown. The flow signal generator

built directly into the electronics enables remote verification of the electronics. The sensor strength value is typically used to see the flow signal and provide further information about the filter settings and health of the sensor.



### Does Emerson's Rosemount Quad Vortex Flow Meter save time, money, or both?

**A:** With such a simple installation consisting of bolting in, wiring up and turning on, installation time and costs are greatly reduced. As mentioned earlier, because there are no moving parts, no calibration needed in the field, and no maintenance required, both time and money are saved with this solution.

To learn more, visit our website:  
[www.emerson.com/redundant-vortex-meters](http://www.emerson.com/redundant-vortex-meters)

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