

Finding & Perfecting your Flow

Processes now require larger, more reliable flowmeters to not only handle challenging flows and an unprecedented range of flow rates, but also be subjected to more two-phase flow and empty-full-empty conditions as manufacturing lines are set up and blown out, ready for each new batch.

By Tom O'Banion, Director of Chemical Industry Marketing, Emerson Process Management

The issues facing process, instrumentation and electrical engineers are wide-ranging, and affect most industrial and process industries. For the chemical industry, challenges run the gamut from handling production complexities to preparing for a less experienced workforce. While many of the operational issues chemical industry engineers face can be minimized by applying best-in-class measurement technologies that provide the needed control, coupled with accuracy and actual process insight, workforce issues require training and knowledge-sharing resources from other experts in the field.

Production Changes

Many large global organizations within the hydrocarbon industry are either amalgamating plants, shifting production to world regions with less expensive feedstocks or shifting production to be closer to customers. The result has been the creation of much larger refining and chemical complexes with production capacities far greater than existing plants.

Likewise, fine chemical manufacturers, such as producers of personal care products, are facing production challenges. In the past, chemical companies manufactured a relatively small selection of products, set their plant up for long production runs and stored the products ready to fulfill their customer orders. Many of these companies now offer a much larger range of formulations and are operating their plants on just-in-time manufacturing principals. For one manufacturer, this has meant a rise in the number of recipes from eight to 55 and a reduction in the average batch time from weeks to hours.

As a result, chemical processes are requiring larger, more reliable instrumentation that can handle challenging process

flows and a far greater range of flow rates than were previously seen. Processes are also being subjected to more two-phase flow and empty-full-empty conditions as manufacturing lines are set up and blown out, ready for each new formulation batch. Coriolis meters are now available for large 8- to 12-inch (200- to 300-mm) line sizes, delivering supreme accuracy. To handle difficult operating conditions, some Micro Motion meters even provide advanced electronics, such as MVD™ multivariable-digital technology, which enables faster performance and improved measurement accuracy under difficult process conditions.

Process Insight & Control

In order to cope with the need for more production, engineers are looking for ways to tune up and/or upgrade their processes in order to get greater yield and reduce unplanned process shutdowns. Similarly, engineers are gravitating toward greater device diagnostics to be able to predict and prevent unplanned outages, as well as extend the runtime between shutdowns, keeping processes up and running. To achieve this, the chemical industry often seeks higher accuracy from its measurement and control, which has led to more use of Coriolis measurement technology.

For example, Emerson's Micro Motion device diagnostics include Smart Meter Verification. At the touch of a button or on a pre-determined schedule, Smart Meter Verification can verify the entire Coriolis meter performance—electronics through sensor—while the process runs ... and in less than two minutes. This feature extends the frequency (or eliminates the need) for calibration and enables operators to run the plant for longer intervals. Emerson's Smart Wireless THUM adapter is also available to access diagnostics and then transmit the data over a wireless network based on the IEC 62591 standard.

Another issue for the fine chemicals industry is managing product giveaway: To avoid providing less than the minimum specified contents of a product, suppliers overfill containers. With less accurate measurement devices, manufacturers work to a large margin of error and give more product away. With tight margins and sometimes costly ingredients, this giveaway means the difference between profit and loss. Manufacturers can tighten up measurement accuracy with high-speed Coriolis mass flow filling measurement technologies.

Raw Material Quality

Much of the crude oil now being processed in the hydrocarbon industry has more challenging properties than oil extracted from older fields, such as heavier, more sour crude oil. In addition, to maximize production and profitability, chemical plants are trying to get far more end product from the raw material available. Flow and density measurement meters are now subjected to more extreme conditions, such as higher temperatures and pres-



Micro Motion, a division of Emerson Process Management, provides several families of flowmeters that can handle challenging flows.

tures. Coriolis meters are now being used as an accurate solution for these tough conditions. On top of withstanding high temperatures and pressures, meters are available in more exotic materials, such as Super Duplex steel.

A Changing Workforce

For many years, there has been a lack of engineers entering the process industries. As the long-time engineers retire and their expertise leaves the organization, many chemical plants are realizing the systems are not in place to capture the knowledge of these retirees. This has led to a greater reliance on equipment vendors to supply in-depth training and ongoing support.

Emerson is committed to making process control technology easier to use through its Human-Centered Design Institute. In supporting the changing workforce dynamic, Emerson aims to make products that are not only reliable, compatible and cost-effective, but also bring about significant improvement



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in workforce productivity. Moreover, Emerson's Micro Motion Online Community is available to assist engineers who are used to finding

answers to questions via online forums. The community strives to deliver expertise online, while connecting engineers with their peers to share insights, best practices and flow measurement knowledge.

In order to keep track of industry trends and customer challenges, Emerson relies heavily on customer input. The company's customer advisory groups brainstorm critical issues and identify the improvements needed to resolve them. Solutions developed to address the aforementioned challenges have been directly influenced by input from chemical industry customers, thereby advancing flow and density measurement technology to better deliver results in chemical process applications. **CI**

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