Cost-Effective Advances In Radar Level Technology

You can't control what you can't measure. It seems simple enough, but accurate measurement can be one of the more complicated aspects of operating a water, wastewater, or industrial plant. There are unexpected hiccups in the process that can alter recordings, hazardous conditions to contend with, and tons of data to collect and analyze.

To find out how to make the most out of measurement, we turned to Endress+Hauser's Dean Mallon, the national level product manager. He talked to us about the challenges of measuring liquids in water and wastewater operations, how operators can leverage the precision of radar, and utilizing data to make everything easier.

What are some of the challenges most people might not consider when it comes to measuring liquids in water and wastewater treatment?

Many people do not keep in mind that disturbances can happen during a process—things like an unanticipated increase in foam or sludge, which put reliability and accuracy at risk and could lead to the loss of the signal.

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How has liquid measurement evolved over time in the water and wastewater industries?

As the cost of goods has lowered and manufacturing practices have become more efficient, there has been a decrease in the cost of purchasing manufacturing instruments. This means higher-quality,more accurate technology becoming affordable to more customers.

How does radar measurement work? Radar is a time-of-flight type of measurement. It is a calculation of the distance between the device and the product surface. It utilizes the formula "D= C x (T/2)." In that formula, D represents distance; C represents the dielectric constant, with air being one and water being 80; and T represents the time it takes for the measurement to be emitted, reflect off the liquid, and then travel back to the device.

How innovative is radar measurement?

Radar measurement has been around for a number of years, and there are innovations still happening within this technology. The algorithms that take the information collected by the radar unit are what continue to evolve, and that's really the innovative piece that differentiates one manufacturer from another. The goal is to increase reliability and safety while making the transmitter easier to configure and set up.

Why has the ability to access measurement data become popular for water and wastewater treatment operators?

The ease of use and quick access of measurement data aids in their evaluations when challenges occur. It also helps to demonstrate quick return on investment of the equipment. The more data an operator has on their process, the easier it becomes to run the plant in a more efficient manner by reducing operational costs.

How does Endress+Hauser's Micropilot FMR10 and FMR20 take advantage of the latest capabilities for remote data access?

We use Bluetooth technology, so operators can easily access all of the data for evaluation, order spare parts, and confirm the instrument in question is running as expected. We also use our HART [Highway Addressable Remote Transducer] communication in the device, so data can be accessed locally or at any point along the power loop.

Can this data still be collected and accessed in hazardous conditions? Yes, through an appropriately rated Bluetooth-enabled smart device and through HART if the communication device is rated appropriately.

How can operators leverage the data provided by Micropilot to improve operations?

With our FMR10 and FMR20, the envelope curve from both Bluetooth and HART is key to actually seeing what is happening with the process and managing a quick reaction time with accurate information. Quick, accurate information increases the runtime, quality, and efficiency of the process.

Across our Micropilot platform, we can provide predictive measurements, which are found in the FMR5X transmitters. Predictive measurements can be used to analyze process changes before they become process upsets, resulting in a lost signal. In a typical example during agitation, foam can become present and increase to the point of signal loss.

What is the advantage of the "non-contact" measurement aspects of Micropilot?

Non-contact is a very common customer preference. Because of the physics of the technology, there is nothing touching the process. Non-contact is typically preferred in dirty environments where contact with the product could require more excessive maintenance, and many of the processes cannot be shut down to remove transmitters for cleaning because of safety and runtime concerns. Chemicals utilized in water and wastewater plants can also be corrosive, which leans more toward a technology that is not in contact with them. The low cost and compact nature of the FMR10 and FMR20 non-contact radar device is the smallest and lightest radar transmitter of its kind in the industry. Level products in contact with the process can be more costly and cumbersome to install and maintain.

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