

Designing For Process Automation: 5 Keys To Success

A Q&A with Craig Correia, Head of Process Automation (U.S.), [Festo Corporation](#)

For most water and wastewater treatment plant operators, the words "process automation" are likely music to their ears. Labor requirements are reduced, while processes become more efficient and reliable — all outcomes that make an operator's life easier. But the decision to automate will often fall on the engineer in the design stage of a plant build or upgrade. I wondered what guides an engineer's decision to automate specific processes, so I went to Craig Correia, head of process automation at Festo Corporation, to gain some insight.



The following Q&A should serve both engineers and operators; engineers are given the proper parameters to consider, and operators are provided ammunition to lobby for process automation.

What types of treatment processes should engineers consider automating?

A common process to automate is membrane filtration, specifically reverse osmosis and ultrafiltration. The high concentration of process valves makes it a logical choice. It's easier to automate or to remotely control these valves.

How early in the design process should automation be considered?

The sooner, the better. Automation is at the core of plant layout or equipment selection. In our experience, 80 percent of the long-term operation costs are dictated in the first phases of conception.

A plant automation system can be operational for as long as 25 years. Unplanned shutdowns, diagnostics to foresee issues, and the ability to expand with new regulations will all play a role in operational costs; therefore, deciding the role of automation needs to be one of the first steps.

What are the parameters to look for in the design stage to determine whether or not a process should be automated?

Any project with a high valve count, with redundant or repetitive processes, or that requires action when an operator might not be available is ripe for automation. The same is true for any process where a large amount of data needs to be viewed centrally or stored, or where the quality is dependent on feedback from sensors.

Plant builds and upgrades are often restricted by "low bid" policy, and automation is often the first part of a design that gets cut out. How do you fight to keep it in?

Stress the long-term costs. The regulations you face are always changing. Your plant's responsibility to deliver quality requires that you process an increasing amount of information, and manual feedback and controls can only get you so much information.

Automation can ensure safe operation at all times, particularly for small- or medium-size plants that don't have 24/7 staffing. As regulations change, automated systems typically are very flexible to accept additional feedback from sensors, add additional valves, or change the process timing. It simplifies the control centrally and allows the plant manager to focus on the most important variables. It can also maintain a log of past data — for example, the readings of a critical sensor.

Festo's [CPX/MPA range](#) of I/O and pilot valves embedded with our CEC controller is based on CoDeSys. This is a standardized control platform with robust, simple, and relatively cost-effective software. A large portion of automation costs is attributed to the software and the programming effort. Great strides are being made to reduce these costs and simplify.

What are some good learning tools for those who want to better understand process automation?

The Water Environment Federation (WEF) and the American Water Works Association (AWWA) hold numerous regional and national conferences, which are an excellent place to start. There are usually working groups or seminars related to automation.

Festo also has an independent education division, which offers courses and training hardware. The EDS - Environmental Discovery System for Water Management range from [Festo Didactic](#) simulates the core processes of water and wastewater management and automation. Participants get hands-on practice with control theory, valve automation, and programming.

Craig Correia has worked for Festo for 16 years, the last 5 years as head of process automation in the United States. He holds a BS in mechanical engineering from the University of Massachusetts and an MBA from Providence College. He has held various technical, management, and business development roles at Festo, including two years as global industry segment manager based in Esslingen, Germany.

