



Lifecycle Management — Enhancing The ROI Of Control System Investments

In water plant operations, there's no such thing as simply maintaining the status quo. Any utility that is not moving forward — in terms of utilizing data from analytical instrumentation, refining process control, and responding to regulatory standards — is falling behind.

Whether a water treatment or wastewater treatment plant (WTP/WWTP) chooses to rely on in-house resources or outside specialists, here are some lifecycle management approaches that can be used to upgrade control capabilities without compromising performance or return on investment.

Build New Capabilities On Existing Platforms

Do not assume that upgrading process control requires starting over from scratch. With a well-crafted lifecycle management strategy, it is possible to achieve new control capabilities without scrapping the entire cost and effort invested in an existing control platform.

Unlike a traditional rip-and-replace mentality, which can run up costs, disrupt operations, and require excessive employee retraining, taking an incremental approach to lifecycle planning can save 60 percent to 80 percent of the cost of all-new hardware and software.

Better yet, such a plan can be executed as part of a maintenance budget, an



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operations budget, or a capital budget — with little to no interruption of production output.

Best of all, a well-thought-out strategy blends existing infrastructure with new capabilities from different sources to streamline processes at reduced cost. [This video](#) provides broad perspective as well as specific insights for rethinking lifecycle management processes,

regardless of the age of existing equipment.

Start With An Open-Minded Approach

As with so many other water treatment processes, there is no one-size-fits-all solution to lifecycle management. Considering the unique aspects of process requirements throughout all phases of plan development and execution will pay dividends in the long run.

- **Discovery.** Be sure to target the areas of **greatest production risk and greatest opportunity.** A benchmarking process conducted among all related parties — engineers, operators, maintenance, plant management, IT, and cybersecurity personnel — is crucial. It will help to document the current state of operations — process controller use, bandwidth use, common breakdowns, manual control loops, time lost to maintenance, etc. — and quantify the efficiencies that might be achieved.
- **Formulation.** Do not approach the situation with a preconceived mind-set. Probe engineering consultants and equipment suppliers on alternate executions to existing systems, or about potentially enhanced capabilities offered by different equipment. Evaluate not only what existing equipment functionality can be preserved, what might be adapted, and what might need to be replaced or upgraded, but also the intellectual assets and control logic that make them all work together.

Whatever the final plan, be sure to include concrete **return-on-investment justification.** That will demonstrate how much a “just-keep-it-running” strategy can differ from a long-term strategic upgrade.

- **Implementation.** Taking the time to ask key questions about integration during the plan formulation stage can save time and money in the long run, just as implementing with an eye toward the future can simplify subsequent growth or upgrade. **Incremental migration planning** can also provide peak efficiency while allowing improvements to be implemented in phases — being

done during regular operations, routine maintenance shutdowns, or over multiple years to spread out budget costs.

- **Review.** Do not close the case with final implementation and commissioning. Continue to **review and update the plan periodically,** evaluating system performance with an eye toward potential improvements that might pay for themselves in terms of greater operating reliability or cost savings.

While lifecycle management strategies can be developed in-house, there is typically value to collaborating with experienced control system analysts who can contribute their experiences with the most productive strategies used across hundreds of WTP/WWTP installations.

Customize The Building Blocks Of Lifecycle Management

Incremental lifecycle management touches on all aspects of control systems — field inputs, I/O interfaces, smart devices, control logic, application software, standardized communications protocols, the human-machine interface (HMI), and supporting infrastructure. Its core value, however, is in protecting the three overriding investments in the entire chain:

- **Control Process Logic.** Building more intelligence into today’s control systems, user graphics, and alarm management accommodates a wider range of operator experience when dealing with process deviations, abnormal situations, and critical issues. Collaboration with process control specialists who understand both control system architectures and water industry logistics can empower the variety of plant personnel who access the system to fulfill their own job responsibilities.
- **Engineering Documentation.** Documenting the water

treatment system status, control interactions, and alarm management strategies as part of control system upgrade planning does more than just empower system operators. It also guides engineers, maintenance personnel, plant managers, IT managers, and cybersecurity specialists who support the system through their own specific disciplines.

- **HMI.** Layering an updated HMI on top of the current system’s I/O terminations is one of the easiest ways to upgrade performance while leveraging the value of existing infrastructure. This enables utilities to accommodate a new generation of operators raised on more visual and higher level mobile-device interfaces.

Add Everyday Value With A Long-Range View

True lifecycle management is not just about wholesale infrastructure upgrades. It is about evergreen management and enhancement based on evolving goals and needs. Maintaining an ongoing lifecycle management strategy can support almost daily improvements in technical functionality while lowering a utility’s average annual investment.

Cybersecurity is a prime example. From keeping daily patches current to upgrading the overarching security strategy to keep pace with continuously evolving threats, it needs to be one of the most readily adaptable aspects of lifecycle management.

A smart water strategy is another big-picture approach that demands a broader [management and control perspective](#) to maximize the benefits of data generated from both production and distribution systems.

Finally, be sure to account for all the other [day-to-day concerns](#) that can generate greater value when coordinated under the umbrella of an ongoing lifecycle management strategy. ■