Water Purification Solution Cuts Costs FOR *Pharmaceutical Manufacturers*

Maintaining control of water quality, especially microbiological quality, is a major concern in the pharmaceutical industry. The *United States Pharmacopeia* and other pharmacopeias require that manufacturers start with drinking water and then purify it to specific standards depending on its use. Compliance with standards/regulations as well as internal water quality specifications is essential for ensuring patient safety on many levels as water is used as an excipient, for cleaning, reconstitution, analytical work and more.

Modern water systems are essential for helping manufacturers ensure standards for water quality are met, yet such systems can require significant investments to maintain and operate. This article explores how one company was able to significantly reduce the time, effort, and resources devoted to running its water purification system, all while maintaining standards for high-quality water.

Background: Increasing Costs of Water Purification

Integra LifeSciences, headquartered in Plainsboro NJ, is a leading developer of collagen-based surgical materials for wound reconstruction, implants, skin grafts and more. Producing high-quality water is essential for their product line.

"Our quality standards are well established, and we monitor our water purification systems continuously," states Fred Lewis, senior project engineer at Integra LifeSciences. "Water quality is a huge deal for us. Failing to meet standards is not an option."

Lewis, who is responsible for ensuring the firm's water purification system and other systems are functioning properly, says one of his sites needed a better solution for improving the operating costs of making process water. "The system we had been using was extremely expensive to run and required service visits twice a week on average," Lewis explains.

Integra LifeSciences had several banks of mixed-bed ion exchange resins to handle the process water flow. "Feed water goes through a series of steps to feed our still. When we started seeing ion breakthrough, we would have to call for service and they would come and replace the bottles," says Lewis. In addition, Lewis's team maintained several spare bottles for replacement when service calls were not available, like in the middle of the night. "It was very hands-on and expensive," Lewis states. "Our operating costs ended up in the hundreds of thousands of dollars."

Exploring Solutions

Lewis's primary goal for addressing these issues was to significantly reduce the service deionization (DI) frequency of their process water purification system. His team recognized that Evoqua's Water One® services would help decrease operational costs. "I've been working with Evoqua for a long time and I've had good experiences with their equipment and services. They're well-known in the industry for their expertise," says Lewis.

According to Rich Jarrett, pharmaceutical marketing director at Evoqua Water Technologies, Water One services have been a particularly important offering in recent years. "Across the different industries we serve, we have seen a significant decrease in end-user water expertise and a shortage of customer resources to maintain and operate water systems," Jarrett observes. "As a result, we have seen an increase in the use of outsourcing as a way for companies to focus

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their efforts on areas where they have core competencies and to leverage the expertise of others where they do not."

For more than 20 years, Evoqua Water Technologies has focused on water treatment, including developing technologies and operating systems for water used in industrial processes. Working with customers, Evoqua designs, builds, and maintains water systems that deliver the quantity and quality of water the company needs; providing the capital, labor, and skills that are needed so that the right quality of water is available. "This maximizes plant uptime, reduces water usage, and controls costs," Jarrett says.

The Water One services process starts with a site survey, where Evoqua collects information on the customer's process, such as the source water quality, potential seasonal variation, the quality and quantity of water needed for manufacturing, the production schedule and more. "By understanding the feed water and the customer's production requirements, we can identify the best equipment to generate and maintain the quality of water that is needed to meet production schedules, so the right water is available when it is needed," Jarrett explains.

Then, Evoqua builds and maintains a water system for a pre-determined price, which includes consumables, emergency repairs and other costs. Systems can be monitored 24/7, 365 days a year; real-time data analytics allow for rapid response from a local service team and system optimization. "We can remotely monitor key process parameters such as flow rates, pump pressures, conductivity and total organic carbon," Jarrett explains. "We can keep an eye on the performance of the equipment and proactively schedule maintenance activities to keep our systems running."

Results: Boosting Efficiency with Water One

With Water One services in place, Lewis says he saw an immediate reduction in service costs: "Our service calls have dropped dramatically. Evoqua specialists come in weekly to monitor the system, and bottle exchanges happen once a month or so…it's seamless for us because it is all maintained by Evoqua."

Though Integra LifeSciences' operators still make daily rounds for quality assurance checks, few unexpected maintenance issues have occurred. Such a hands-off service, he says, took the maintenance staff by surprise, "but they quickly realized they now have one less system to worry about."

Lewis initially had to address questions raised during a risk assessment because WFI is a validated utility. Evoqua worked with Integra LifeSciences to detail the operation and performance of the Water One process to show that the quality of the water was as good or better than the previous WFI Pretreatment system. The fact that the distillation process and final pretreatment polishing steps (already service DI based) remained unchanged meant that Lewis simply had to explain the nature of the changes and demonstrate how they could maintain their quality standards with a straightforward Installation Qualification (IQ) and Operational Qualification (PQ).

He states, "To show equivalency, we verified that the equipment was there, that it operated the way we wanted it to and we looked at conductivity…There were no changes in quality."

Conclusion

With the goal of reducing the expense of operating its water purification system, Integra LifeSciences chose to partner with Evoqua to provide and service their WFI Pretreatment equipment. Immediate efficiencies were realized, and now four years into the contract, savings continue to pay dividends, without interruptions in production or quality.

For more information, please visit www.evoqua.com/en/markets/Pharmaceutical/Pages/water-one-pharmaceutical.aspx